STUDIES ON SOCIAL AND EDUCATION SCIENCES 2022

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Table of Contents

PREFACE

Studies in the fields of education and social sciences have always been important in terms of their impacts on society. The studies in this book contribute to the fields of education and social sciences by different research methods, participants, and contexts and add a global perspective to these fields.

The book is divided into two sections related to studies on social sciences and education sciences. While the section on social sciences includes 10 chapters, the section on education sciences involves 13 chapters. The chapters' contributors are from the following countries:

- Georgia
- India
- Iran
- Lebanon
- Philippines
- Saudi Arabia
- South Africa
- Sweden
- The Netherlands
- Tunisia
- Turkey
- United Kingdom
- United States

The international Society for Technology, Education and Science (ISTES) offers several conferences on Education and Social Science, held in different cities and countries. Scholars and researchers from worldwide have the opportunities to display their researches on education, exchange visions and get acquainted with colleagues for future collaboration.

Above all, these annual gatherings bring scholars closer to others' schools and universities systems, curricula and about the actual state of researches for more than 50 countries.

The present annual book on Studies on Social and Education Sciences 2022 consists of 23 chapters that cover the latest trends in Education and Social Science studies. Namely, technology-oriented education, STEM-Education, Leadership and Management, etc.

We would emphasize that we've been attending and participating to ISTES conferences for years, with our mentors, then with our colleagues and lately with our students, and we can say that at every conference we were meeting with international researchers and teachers, we could benefit from their publications.

Thank you ISTES for making of each conference a meeting hub for educators, teachers and laypersons.

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SECTION I - STUDIES ON SOCIAL SCIENCES

Chapter 1 - Packing the United States Supreme Court and Judicial Interpretive Philosophy: Implications for Religion in the Public Schools

Timothy John Seigler

Chapter Highlights

- In this article, I will discuss the nature of the judicial philosophy of originalism and why a President might seek to "pack the court" with a nominee who holds to originalism rather than another method of constitutional interpretation.
- Likewise, the question will be raised as to why a democratic president and a senate might dominated by democrats pushed to have the United States Supreme Court packed with non-originalist justices.
- The short answer lies in the social, economic, and political implications that result from applying various methods of constitutional interpretation.
- Court packing makes a difference.
- One area of social life that is likely to significantly impacted by "court packing," is the area of religion and the public schools.

Introduction

On January 27, 2022, President Joe Biden publicly announced the retirement of Supreme Court Justice Stephen Breyer. His retirement is expected to begin at the end of the October term. So, what is the fuss surrounding his replacement all about. Part of the contention centers around race equity. President Biden promised to "pack the court" with an African-American female, but not just any female of color. She would be of African-American descent. Having a sufficiently-hued skin tone, however, would not be enough to qualify her as a successor to Justice Breyer. Furthermore, no female nominee would even make it onto the "shortlist" without the acquisition of a highly regarded legal education, years of experience in litigation, and an exemplary tenure on the judicial bench. Presuming that those boxes are checked, Biden is expected to nominate an African-American female whose judicial philosophy is likely to yield outcomes favorable to the democratic agenda. Once appointed, the Supreme Court conservative imbalance notwithstanding, her judicial philosophy and her ability to persuade her colleagues to follow her legal reasoning could become of import to host of issues, including religion in the public schools.

The attempt by Biden to pack the court is not without a historical context. Court-packing has been readily practiced throughout U.S. history. Presidents have nominated judicial candidates likely to render opinions germane to party political promises made. Liberal President Clinton nominated liberals Stephen Breyer. Conservative President George W. Bush nominated conservatives John Roberts and Samuel Alito. Liberal President Barack Obama nominated liberals Elena Kagan and Sonia Sotomayor. Then, the jurisprudential pendulum shifted to the right again under the Trump administration.

In 2017, President Donald Trump appointed conservative justice, Neil Gorsuch, an Episcopalian, raised Catholic, to replace the late Catholic Justice, Antonin Kennedy, to the United States Supreme Court. In 2018, Trump nominated Bret Michael Cavanaugh, a Catholic. In 2020, the 45th President nominated Amy Coney Barrett, a charismatic Catholic. The three conservative Justices were confirmed by the Republican-controlled United States senate. In 2022, the jurisprudential pendulum shifted to the left again under the Biden administration. The President has chosen moderate liberal, D.C. federal Court of Appeals Justice, Ketanji Brown Jackson as his nominee of to replace 88-year-old Justice Stephen Breyer, for whom she clerked. Outside of nominating a duly qualify African-American

female, the President must then comply with constitutional and administrative laws which establish a process by which the Senate could acquire knowledge needed to provide informed advice to a president.

Article II, Section 2, Clause 2, states that the President "shall nominate, and by and with the Advice and Consent of the Senate, shall appoint … Judges of the supreme Court." After the president publicly announces his nominee, the senate interrogation of the nominee can begin. Such inquiry must be done according to administrative law protocols.

Article I, Section V, Clause II allows for both houses to determine the rules of their proceedings. By common practice however, the rules of the House are publicly acknowledged, but pragmatically ignored. The rules of the majority party of the senate generally carries the day. Such rules allow committee members to ask the nominee questions about prior statements, their views on previously decided cases of the Supreme Court, (not currently before the court or those working their way up the court system), as well as matters related to court procedures. For more than 30 years, at least since the nomination of Justice Robert Bork in 1987, nominees have been asked about their judicial philosophy. Such inquiry was certainly the case during the confirmation hearing Judge Ketanji Brown Jackson between March 21-23, 2022. Why inquiry into her judicial philosophy of those nominees who preceded her?

There seems to be a relationship between interpretive methods applied to various constitutional provisions and their outcomes. For instance, the application of the interpretive approach of original Intent, generally, yields meanings of the Religion Clauses, (namely the Free Exercise Clause and the Establishment Clause) that tend to favor political conservatives. Alternatives to Original Intent such as Structural Philosophy, Textualism, Moral Philosophy, and Stare Decisis, generally lend themselves to meanings of the Religion Clauses that tend to favor political liberals. Each interpretive method has its advocates and critics. Justices, nonetheless, have, collectively employed all of these interpretive methods at some point in the history of the Supreme Court. Originalism, however, is the interpretive approach, although out of usage in recent judicial history, susceptible for resurfacing in the area of religion, particularly in light of the conservative majority. We turn then to the nature of originalism.

The Nature of Original Intent

Originalism, also known as originalism, is a method of constitutional interpretation that views the constitutional text as a written instrument containing the expressed state of mind of its drafters and ratifiers. Originalism presumes that relevant individual and/or collective mental states are discoverable through linguistic and historical analysis. Once discovered, the content of the framers' state of mind, for "strict" originalists, ought to be applied to modern legal problems substantively specific and equally-analogous problems addressed by the framers. (Berger, 1987) For "moderate" origi¬nalists, mental states of the framers that have been identified, usually consisting of beliefs, values, and purposes, ought to be converted into principles at a level of abstraction consistent with the mental state of the framers (Bork, 1986, p. 48).

The creation of principles at a level of abstraction consistent with the mental states of the framers, could become problematic if the level of abstraction is too high. Creating “bridge” abstraction is a justice-contrived endeavor used to bridge a “hermeneutical gap" between the world of the justice and the world of the framers. Framers could not have intended that constitutional language be applied to specific circumstances in the modern world for which they had no way of knowing would exist. The notion that the framers could have intended free universal Wi-Fi for everyone was implausible. Nonetheless, moderate originalists readily endorse the use of abstract principles as long as the level of abstraction is closely connected with the direct or vicarious experiences of the framer and his world. Taxes existed in the framers world, and so did Baptist churches. Therefore, an abstract principle, that supported the use of taxes to pay public bus drivers to take citizens to the Baptist state convention, although likely to be well-debated, was, at least, conceivable. On the other hand, Jefferson and Madison could not likely have intended an establishment of a lottery to win Super Bowl tickets in the state of Virginia.

Originalists, even those not totally satisfied with the method, generally view originalism as a viable interpretive method. They have characterized the meaning that the framers intended the language to have as "fixed," (Scalia, 1986, p. 840) "stable," "objective," (BeVier, 1996, p. 288) "fair," and conducive to judicial restraint. (Bork, 1990, p. 154) Originalism has been presented as the "law" of the Constitution and when compared to it alternatives considered the lesser evil (Morrison, 2019, p. 3).

Non-originalists, on the other hand, have their own perception of originalism. They have character¬ized the doctrine as a "time-travel theory," (Levy, 1988, p. 329) and a kind of "arrogance." (Brennen, 1986, p. 9) Originalism has also been referred to as the doctrine of the "dead hand" (Sager, 1996, p. 275) and its "ghosts," as well as been deemed inapplicable in the resolution of modern legal disputes (Sunstein, 1993, p.211).

Regardless of whether the interpretive approach is an “arrogant”, “time-travel theory” or an “objective, lesser evil”, the philosophy of interpretation, when applied to the Religion Clauses of the United States Constitution, has often led to Supreme Court decisions that allowed Protestant religious expression in public schools to flourish. Moreover, with Trump re-packing the court with additional conservatives, a lowering of the “wall” between government and religion in state-funded public schools becomes even more probable.

The Sitting Conservative Court: A Future of Fear or Hope

Packing the court with conservatives or liberals can have significant implications on American culture as well as the culture of public schools. The conservative-liberal advantage on the federal courts could very well support or denounce civil unions, a right to an abortion, a grant of police immunity when establishing “law and order,” the right of churches to gather amidst a global pandemic, or whether public schools can have a “condom Friday” as a part of its sex education program. The conservative-liberal balance of the court may very well determine whether Muslims get a national religious holiday equivalent to Good Friday or whether school districts would require teacher to introduce the right to gay marriages as a legitimate option for American children to consider.

Regarding religion, liberal appointees are expected to protect privacy domains and to keep the church separate from the state. Supreme Court opinions, influenced by liberal judicial philosophies, should have the effect of promoting racial justice and gender freedom. The oppressive patriarchal systems of dead, White men must be brought to an end by their judicial renderings.

Conservative Justices, once appointed, are expected to apply their judicial philosophy in a manner that would save America from secular humanism, the “helliwood,” film industry, and

other societal clutches of the devil. The judicial philosophy of conservatives on the Court, however, is expected to facilitate the return of America to its Judeo-Christian roots and Protestant Bible-based Christian values established by the framers themselves.

Christian Heritage and National Identity

Judeo-Christian Protestantism, although preceded by Native American religions and early Catholic evangelistic efforts, has been the prominent religion in the United States (Wilson, 2014). Associated with Judeo-Christian Protestantism were notions of Christian heritage and national Christian identity. Practices of traditional Christianity, such as prayer, Bible reading, teaching the Biblical creation, and posting of the Ten Commandments were evident in society and public schools well into the 1950s. The historical roots of traditional Christianity, Christian heritage, and Christian national identity can be traced to colonial America. Advancing the Christian faith was a priority for colonists who intended to go to Virginia but landed in New England.

> "Having undertaken for the Glory of God, and Advancement of the Christian Faith, and the Honour of our King and Country, a Voyage to plant the first Colony in the northern Parts of Virginia; Do by these Presents, solemnly and mutually, in the Presence of God and one another, covenant and combine ourselves together into a civil Body Politick, for our better Ordering and Preservation, and Furtherance of the Ends aforesaid." (Mayflower Compact, 1620).

In 1642, the Massachusetts General Court passed a law that required children to read and understand principles of religion. In 1647, the Massachusetts "Old Deluder" law was passed. The law required reading be taught so that the principles of religion and the law of the country could be read and understood. It was intended to defend against the deceptions and the Deceiver (the devil), who the Puritans believed tricked ignorant people into sinning by filling the minds of children with scripture.

> The United States Supreme Court in, 1892, described the nation as "Christian." If we pass beyond these matters to a view of American life, as expressed by its laws, its business, its customs, and its society, we find everywhere a clear recognition of the same truth. Among other matters note the following: The form of oath universally

> prevailing, concluding with an appeal to the Almighty; the custom of opening sessions of all deliberative bodies and most conventions with prayer; the prefatory words of all wills, ……"In the name of God, amen;" the laws respecting the observance of the Sabbath, with the general cessation of all secular business, and the closing of courts, legislatures, and other similar public assemblies on that day; the churches and church organizations which abound in every city, town, and hamlet; the multitude of charitable organizations existing everywhere under Christian auspices,… …the gigantic missionary associations, with general support, and aiming to establish Christian missions in every quarter of the globe. These and many other matters which might be noticed, add a volume of unofficial declarations to the mass of organic utterances that this is a Christian nation (Holy Trinity Church v. United State (1892).

In 1952, the United States Supreme Court stated, “We are a religious people whose institutions presuppose a Supreme Being” (Zorach v. Clauson, 1952). As late as 1955, 77 percent of the public schools in the United States had some form of Judeo-Christian expression (Conway, 1956). Traditional Christians, especially those who desire that "religion" be returned to the public schools, desired more than deistic religion, especially in light of the nation’s religious heritage. Among them are the Southern Baptist, National Baptists, Methodists, African-Methodists, Church of God, Disciples of Christ, Assemblies of God Pentecostals, and some independent charismatic denominations. (North, 1991). Their beliefs consist of the essentials or the "fundamentals" of traditional protestant and Catholic theology (Tillich, 1955).

As would be expected, there has never been absolute agreement amongst Christians within their own respective denomination regarding how much and what kind of Christianity should be returned to public schools. Similar disagreements exist, likewise, amongst liberals regarding how to keep public schools secular. There is, however, consensus among Christian conservatives and moderates that the United States Supreme Court has gone too far in removing the Christian practices from public schools, particularly when removing those religious practices that were a part of the nation’s heritage and identity for some two hundred years. The judicial philosophy of the Warren Burger court fulfilled its duty. Religion in public schools flourish when originalism prevailed. (Sawyer, 2019) And why shouldn’t originalism prevail? The framers were Christians, with Jefferson being the only apparent deist. Nonetheless, the Burger Court opined in a manner consistent with the framers intent.

Not all Burger Court justices were ultra-conservative or ultra-liberal. The pursuit of religious and racial justice challenged justices to interpret constitutional provisions from a moderate conservative or moderate liberal position. Demands for religious freedom and mandates to live free from racial discrimination gave rise to "moderate" judicial interpretive philosophies, many of which yielded both moderately liberal and moderately conservative outcomes.

Moderate conservative Justices often waffled between anti-racial discrimination and national religious identity. Fred Vinson was such a moderate. Justice Vinson was a Franklin D. Roosevelt appointee, whose judicial philosophy led him to be liberal on matters of racial justice as evident in cases such as Sweatt v. Painter (1950), McLaurin v. Oklahoma State Regents (1950), and Youngstown Sheet & Tube Co. v. Sawyer (1952). Vinson opined that racial discrimination was unconstitutional.

On the religious front, however, the judicial philosophy of Justice Vinson favored conservatives. He supported religion in schools in cases such as Everson v. Board of Ed. (1947) and Zorach v. Clauson (1952). The justice, in both cases, appealed to the original intent of the framers of the constitution for legal support. Then the tide changed at his death in September of 1953. The judicial philosophy of his successor, Chief Justice Earl Warren would prove to favor the democratic party regarding matters of race and religion. Rather than to appeal to the original intent of the framers of the constitution, on the matter of race, Warren would take a moral/philosophical and doctrinal approach, an approach that utilized social science data and moral rationales, the results of which were congruent with progressive sentiments of racial justice. On matters of religion, he would rely on a doctrinal-stare decisis interpretive approach, the effect of which yielded liberal outcomes. Public schools would become progressively secularized and the wall erected between church and state became higher and higher.

Under the Moral/Philosophical approach of Chief Justice Earl Warren, new legal doctrines emerged, resulting in the removal of religious activities such as prayer, Bible reading, and teaching the Biblical creation. In rulings in Engel v. Vital (1963) and Abington v. Schempp (1963), liberal judicial philosophies prevailed and progressively separated the church from the state. In Lee v. Weisman (1997), prayer was also banned at graduations and athletic events, even if student-led. The Court in Epperson v. Arkansas (1968) and Edward v.

Aguillard (1987), while deciding that creationism and creation science violated the Establishment Clause, ruled in favor of teaching of evolution. In Mozert v. Hawkins, a 6th Cir. (1987) case, the district court held that references to evolution, humanism, magic, and mental telepathy in reading materials did not amount to what has been referred to as a "religion of secular humanism" barred by the Establishment Clause. Public schools removed postings of the Ten Commandments as a result of Stone v. Graham (1980). For religious conservatives, the "religion of secular humanism," represented a "dethroning" of God and faith in Him, substituted for an "enthroning" of reason and man's reliance on it. These outcomes have been influenced by a collection of judicial philosophies.

According to modern scholars, "It takes a theory to beat a theory, in the following sense: either originalism is our law, or something else …" (Baude & Sachs, 2019, p1445) Here is where a discussion on the alternatives to originalism might be helpful, particularly as a preparatory step for political activism during the senate confirmation process.

Alternative Constitutional Theories to Originalism

The methods of interpreting Constitutional language employed by the Supreme Court falls within two major philosophical categories. The first, the strict construction philosophy, assumes the premise that Constitutional interpretations should rely on constitutional language, values, principles, history, and the original intent of its framers and ratifiers of the Constitution. The second, the "living document" philosophy, assumes the premise that constitutional interpretation should be guided by values and processes outside the "four corners" of the Constitutional text. Meanings of the text should come from inferences drawn by an analysis of the "plain language" of the text, structure and design of the Constitution, moral philosophy, natural law, neutral principles, or the doctrine of stare decisis. Both the strict construction and "living document" methods of interpretations have been applied to the forementioned cases evoking the Establishment Clause, yielding results correlative to judicial philosophies. We turn to the first alternative, the structural analysis interpretive approach.

Structural Analysis

Some interpreters who view the Constitution as a "living document" look to its design and structure and from it infer the purpose of the Constitution. For instance, inferences drawn

from the structure of the unamended Constitution has led to notions that the Constitution is overwhelmingly concerned with processes and structure, (Hart, 1980) The addition of the Bill of Rights, furthermore, suggested that certain fundamental values, although presumed protected by limited powers of government, should be enshrined. A change in constitutional structure implied a purpose for those changes. In the case of the Bill of Rights that purpose was to protect inalienable rights.

Justice Hugo Black, in Engel, appeals to the purpose of the Bill of Rights to strike down a "governmental establishment" in the form of school prayers composed by governmental officials. The framers allegedly added the Bill of Rights to protect against religious establishments as they knew them. It was added to protect against government infringement and secure individual freedoms. A governmental establishment of religion would be an inherent violation of the freedom - not to belong to a religion or religious institution established by government.

It should be noted, however, that the inferences drawn from the structure of the constitution are creations by justices, not the framers. Liberal justices could argue that government-composed prayer created to be recited by children, thereby establishing religion. The prayer therefore should be banned. Conservative justices could argue that, while prayer is a religious expression, the prohibition is against a religious establishment, meaning an organization with a hierarchy of authority, democratic processes, and voting members, such as the Anglican, Baptist, or Methodist churches. A 22-word prayer, however, composed would not constitution an institutional establishment and should be allowed.

The structural approaches have also been used to interpret matters pertaining to race. The Civil Rights amendments added to the U.S. Constitution between 1865-1870, resulted in a structural change of interpretive importance. Justice Thurgood Marshall viewed the document in its beginning form as racist and sexist. He asserted that even the government that the framers devised was defective from the start. It required several amendments, a civil war, and massive social transformation to attain the system of Constitutional government that would respect individual freedoms and human rights. (Marshall, 1987)

The Constitution, thus, according to Marshall, should not be celebrated because of its status at its conception, but because it, with its Bill of Rights and other amendments, and the

manner in which the Supreme Court construes its provisions has made it a "living" document (Marshall, 1987). The change in the structure of the constitution serves as a rationale for protecting against racial discrimination. So could be said about the Nineteenth Amendment as pertaining to the rights of women. While justices who adhere to the interpretive philosophy of original intent are confined to the framers world view, justices who adhere to a structural approach are free to create rationales for structural changes beyond the framer's paradigm.

Although the framers embedded within the Ninth Amendment the presumption of the existence of other rights not listed, they still would not likely have approved of a right of negroes to vote for a president of the United States, nor have approved of an African-American woman serving on the highest court in the land. For the framers, rights, even those not yet enumerated were preserved for White Americans. There were never to be structural changes that gave negros or their descendants such privileges. The interpretive application of original intent to race matters would make the Thirteenth, Fourteenth, and Fifteenth Amendment susceptible to revocation. The structural approach and stare decisis are interpretive methods that would protect against such a reversal.

Textualism

Members of the Supreme Court and other legal scholars, regardless of inferential guidance from the structure of the constitution, find deriving meaning of various provisions of the Constitutional text at the center of the interpretive task. A strict textualist, someone who relies on the "plain language," believes that the text is the only step in interpretation. Other more moderate textualist claim that the texts should be combined with other liberal methods of interpretation, including lexical analysis and the use of words commonly found in other documents. Supreme Court Justice Antonin Scalia sought to persuade is colleagues to adopt textualism as the Court's a method of interpretation of statutes (Pushaw, 2016).

Judicial applications of textualism are likely to produce outcomes favorable to both liberals or conservatives. The interpretive method allows justices to read modern constructs into the text that the framers would not likely have allowed. For the liberal textualist interpreter, equal protection could be interpreted as meaning "equal protection," even for same-sex marriages. A conservative textualist, however, could infer "equal protection" to mean equal protection, but for those who qualified for it, and only hetero-sexual marriages would be eligible for such

protection. The framers would most certainly have denounced same-sex marriages and perhaps advocated for the imprisonment of the unnatural couple. The safer practice for textualists was to merge textualism with another interpretive method. Such was the circumstance involving a 1984 statute regarding equal access to school facilities and a 1990 Supreme Court case that adjudicated the dispute over whether after school clubs could have equal access.

In statutory-based cases involving religion, the Supreme Court initially used a moderate application of textualism, exploring legislative intent, but then combine textualism with stare decisis. In 1984, Congress passed the Equal Access Act. The act allowed "non-curricular' clubs such as the Gay-Straight Alliance equal access to school facilities as along as at least one other non-curricular club was permitted. The Supreme Court's holding in Board of Education v Mergens, 469 U.S. 226 (1990) affirmed the right of non-curricular clubs to function without discrimination based on religious or other viewpoints. Textualism was combined with the three-pronged Lemon Test. The combined interpretive methods on one hand provided a win-win for equal access afforded to the Gay-Straight Alliance and for after school religious groups. On the other hand, those who want a separation between church and state or for those who wanted traditional morality brought back to publics schools, the interpretive methods yielded a win-lose by permitting the "unwanteds."

Moral Philosophy-Natural Law

The idea of using moral philosophy as an interpretive is antithetical to the disposition of judicial restraint. Personal morals are not to serve as the basis of Supreme Court opinion. Substantive due process, however, based upon natural law has served as a legal segue for constitutional interpretation based upon moral philosophy. Substantive due process is the notion that certain inalienable, natural law rights, unrelated to procedure should be protected.

Thomas Grey contends that there is an inherent morality of natural law and that principle based upon natural law should be given constitutional status (Grey, 1985). Natural law is a construct of governance deduced by observation of human nature and based upon values intrinsic to the human experience. Natural law, at times, intersects with eternal or divine law as divine sources reveal about human nature, what natural observation are limited to disclose.

The innate notion of the existence of God or a divine "other" constitutes a right to pursue a relationship with God in light of one's conscience. An attraction with the opposite gender, and the capability to covenant and reproduce serves as a self-evident natural right to marriage and family. The ability to make a free-will and informed choice constitutes a right to contract as well as enables humankind to choose with whom one might associate, individually or in community. The human capacity to create and manipulate ideas, form judgements, and the vocalize them to others evinces a natural right to speak according to one's conscience. The inclination to clothe oneself and construct habitats for the preservation of self and to safeguard ones privacy is fundamental to human existence and personal happiness. Natural law endows individuals with a right to work in order to satisfy ones hunger and thirst. For Grey, modern constitutional provisions are undergirded by higher moral, God-given laws. It is interesting to note that liberal Justice Thurgood Marshall and conservative Clarence Thomas have both drawn from natural law to oppose racial injustice (Barker, 171) Thomas Jefferson, on the other hand, use natural law to affirm the inferiority of the negro. The yield of the interpretive method seems to depend upon the ideological predisposition of the individual applying the method.

Stare Decisis and Doctrinal Analysis

Constitutional theorists, nonetheless, have also subscribed to the postulate that constitutional interpretation should be guided by the doctrine of stare decisis. The Latin phrase literally means "to stand by things decided." The Supreme Court, according to this doctrine, should look to previously decided cases for guidance in adjudicating future cases (Monaghan, 1988). Monaghan argues that stare decisis operates to promote system-wide stability and continuity by ensuring the survival of governmental norms that have achieved unsurpassed importance in American society.

Regarding religion in public schools, the United States Supreme Court, at least for the present time, seems judicially committed to the "Lemon Test," a similar "neutrality test," or a "coercion test." The operative words here are "until now." The conservative shift in the composition of the court may get a chance to express its conservatism. In fact, newly appointed Justice Amy Coney Barrett, argued for a more relaxed form of stare decisis (Barrett, 2017). All that is necessary is the right case to brought before her and her fellow conservatives justices, before a relaxed interpretation of stare decisis or an incremental return

to originalism emerges. Liberals are not likely to support a Supreme Court nominee who might take a "relaxed" position on the precedent of Brown or Roe. Biden's nominee is likely to be grilled on her view of stare decisis, as well as other methods of constitutional interpretation.

Originalism, Multiculturalism, and Religious Pluralism

Between 1900 and 1914, some 1,900 people on average passed through Ellis Island in New York each day. Some days there were double that number of arrivals. (New York Times, 1893) The nation's diversity can be traced to the arrival of immigrants from all over the world during this period and thereafter. Irish, Greeks, Serbs, Turks, Poles, Italians, French, Germans, and Jews came in waves. Other ethnicities from Scandinavia, Russia, the Baltic, Balkans, India, Africa, and people from other parts of the world likewise flooded the country, bringing their religions and cultural ways of life with them. The United States, just over 120 years later, has maintained its diversity. Between 2010 and 2020, the multiracial population has grown 276%, from 9 million to 33.8 million. (U.S. Census Bureau, 2020).

The United States, moreover, is one of the most religiously diverse cultures in the world. Its religious diversity, however, is heavily skewed toward Christianity. About 14% of Americans are White evangelical Protestants, 16% are White non-evangelical Christians. Catholic Christians make up roughly 12% of the population. Over 25% of the population view themselves as Christians of African-American or of Hispanic descent. With the addition of the almost 2 percent of Latter-Day Saints and Orthodox Christians included in the mix, over 70% of the population in the United States, is affiliated with some brand of Christianity. The religions of Islam, Judaism, Buddhism, Hinduism, and other alternative religions make up about 5%. Some 23% of Americans have no affiliations with religion or identify with atheism or agnosticism (PRRI, 2020).

How does the Supreme Court reconcile religious justice with an ethnically diverse culture? For non-originalist the resolved is less complex. The structural approach and the moral philosophy method would likely produce outcomes consistent with a multi-cultural, multi-religion society. Muslims, Hindus, Buddhists, Atheists, and Agnostics would be placed on equal footing with Catholics and Protestants, regardless of the religious heritage of the nations. Prayer would be allowed for all or denied to all. The Bible, Hebrew Old Testament,

the Tripitaka, the Qur'an, and the Vedas would be made readily available to all public-school children. Religious exceptions would be made to uniform requirements so the religious garb could be worn. Special prayer rooms would be made before school, during recess, and after school. Halal dietary offerings would be made and paid for by free and reduced lunch vouchers. The master calendar would accommodate major religious holidays determined by some equitable system. Where there was a judicial will, a judicial interpretive way could be made.

Justices who might adhere to the interpretive method of original intent would be hard pressed to infer that the framers could have intended what they opposed outright. The framers considered the "mohammedans" and members of other religions such as Buddhism, and Hinduism, as the religions of heathens. It is hardly unlikely that they would endorse efforts to accommodate expressions of those religions in public schools.

The used of original intent as an interpretive method, even where applicable, would require that an abstraction bridge be created to overcome a hermeneutical gap between the world of the framers and the modern world, a multicultural world replete with religious plurality. In the world of the framers, Protestant Christianity and the cultures of Europe were deemed superior. Even with a bridge abstraction, an legitimate employment of original intent is likely to posed interpretive problems for the modern conservative court.

One of the major modern-day challenges that conservatives justice would face is applying the method in light of post-Bill of Right Amendments, particularly the Civil War Amendments. What does the Supreme Court do when the purpose for adding the amendments conflict the beliefs and values of the framers? While it is certainly true that the framers adhered to Christian moral framework, what is often overlooked is the reality that their religious intent and their racial intent stemmed from a "brand" of Christianity that allowed Christians to own, as slaves, other Christians of color. It should not be a surprise then that the brand of Christianity to which George Washington, Thomas Jefferson, James Madison, Benjamin Franklin, and Alexanders Hamilton subscribed would, through the creation of abstract principles, sustain prayer and Bible reading in public schools, while then denying people of color liberty from enslavement, the right to read, and the right to follow the Biblical mandate in holy matrimony. The moderate judicial philosophy Justice Fred Vison found a way to be conservative on the matter of religion but liberal when it racial justices.

The conservative majority, with a Latina and likely two African-Americans in a post-civil rights era would be hard pressed to impose a "strict" originalists construction of the religion clauses. The structural approach, particularly with the addition of the post-civil war amendments would render most abstract principles on racial matters null and void. The framers could not have intended equal seating with free negroes on buses in Montgomery, Alabama when they knew nothing about buses. Even if, through the creation of an abstract principle, justices could infer that the framers held a separate and unequal position, such an application of original intent would be barred by stare decisis and the holding in Brown v Board of Ed, 1954.

Multiculturalism and religious pluralism have made the used of original intent quite a challenge to apply to modern circumstances. Legal and sociological changes over time have widened the hermeneutical gap to the extent that any legitimate use of original intent is minimal and confined in scope to a few applicable categories of exception. Nonetheless, court-packing presidents are still willing to nominate candidates bodacious enough to give originalism a chance where it might apply. In the case of President Biden, the good Catholic, but registered democrat, may prefer a moderate liberal who would "relax' the holding in Roe (so as to favor a right to life), and, in Vinson-like fashion, support the lowering of the wall between church and state, while publicly affirming the value of Black Lives.

Debate over "Court-packing" Reform

There are two interrelated dimensions to court-packing, one procedural and the other ideological. The United States Constitution and sundry Judiciary Acts through out history have governed the initial number of Supreme Court justices and the expansion or reduction of that numbers. Reducing or increasing the number of Justices is not an end in itself. The indirect, and perhaps, more important purpose is to "pack' the Court with justices, who judicial philosophies are more likely to outcomes that favor one political party or the other.

President Biden, in April of 2022, is expected to sign an executive order to establish a bipartisan commission to explore the realties that accompany expanded the number of members of the court. (WhiteHouse.Gov). However, one year ago, April 19, 2021, the Senate Republicans passed S. Res. 164. The resolution conveyed the sense of the Senate that the

number of justices of the Supreme Court of the United States should remain at nine (117th Congress, 1st Session, April 19, 2022). With the 6-3 conservative majority on the Supreme court, the Biden court “packing” reform proposal would have to increase the number of Supreme Court justice by four, just to get a 7-6 majority. Nonetheless, President Biden would not be the first president to urge congress to change the number of Supreme Court justices.

Article III, Section 1 of the United States Constitution says: "The judicial Power of the United States, shall be vested in one supreme Court, and in such inferior Courts as the Congress may from time to time ordain and establish." The Constitution did not prescribe a limit on the number of justices who could serve on the bench at one time. According to Section 1 of the Judiciary Act of 1789 the Supreme Court, "shall consist of a chief justice and five associate justices…", totaling six members (Judiciary Act of 1789, Sept. 24, 1789, ch. 20, 1 Stat. 73).

In 1789, the first Supreme Court consisted of Chief Justice John Jay, James Wilson, William Cushing, John Blair, John Rutledge, and James Iredell. The landmark case for the first court was Marbury v. Madison, 5 U.S. 137 (1803), a case that would ultimately opinions of the Supreme Court, where they apply, as the final authority on matters of law by declaring a matter unconstitutional. Thomas Jefferson won the election over John Adams in 1800. The Judiciary Act of 1801 allowed for the creation of new district courts and justices of the peace. During the March “lamb duck” period, John Adams commissioned William Marbury and some 40 other justices to positions of district judges or justices of the peace. Secretary of State, James Madison refused to deliver the commissions. The matter came before the United States Supreme Court, ruling on its own authority granted by the Constitution. The issues before the Court pertained to whether the Supreme Court had the authority to order the Secretary of State to delivery the commissions. The six-member Court ruled in it own favor.

In 1801, there was a failed attempt to reduce the court to five members. The proposal intended that “from and after the next vacancy that shall happen in the said [Supreme] court, it shall consist of five justices only; that is to say, of one chief justice, and four associate justices." (Judiciary Act of 1801 2 Stat. 89, 1801). In 1807, a seventh associate was added to the Supreme Court due to western territorial expansion, inclusive of the states of Ohio, Kentucky, and Tennessee. United States Statutes at Large (1 Stat. 73)

In response to the Great Depression of 1929, FDR offered a a series of New Deal programs beginning in 1933. In 1935, the United States Supreme Court rendered three opinions that undermined his New Deal Efforts: Humphrey's Executor v. United States, 295 U.S. 602 (1935), Louisville Joint Stock Land Bank v. Radford, 295 U.S. 555 (1935), and A.L.A. Schechter Poultry Corp. v. United States, (295 U.S. 495, (1935).

On February 5, 1937, via the Judicial Procedures Reform Bill, President Franklin D. Roosevelt, wanting to establish a liberal majority on the Supreme Court, expressed his intention to increase the number of Supreme Court justices to as many as 15 members. The President. His court-packing bill failed in the senate by of vote of 70-22.

On March 3, 1837, particularly in light of addition of the eighth and ninth circuits, congress passed legislation which stated, [t]hat the Supreme Court of the United States shall hereafter consist of a chief justice, and eight associate judges . . . and for this purpose there shall be appointed two additional justices of said court, with the like powers, and to take the same oaths, perform the same duties, and be entitled to the same salary, as the other associate judges." (Eighth and Ninth Circuits Act of 1837, 5 Stat. 176).

In 1863, in light of the growth of Oregon and California, the Tenth Circuit was created, thereby opening the door for a tenth supreme court justice. The Tenth Circuit Act of 1863 (12 Stat. 794). In 1866, legislation was passed that provided "[t]hat no vacancy in the office of associate justice of the supreme court shall be filled by appointment until the number of associate justices shall be reduced to six; and thereafter the said supreme court shall consist of a chief justice of the United States and six associate justices." That Supreme Court back to seven members, one justice for each circuit. (The Judicial Circuits Act of 1866 (ch. 210, 14 Stat. 209)

In 1869, President Grant, with the help of the congress, added two seats to the Supreme Court, back to nine, where it remains today. (16 Stat. 44; chapter 22)

For Biden to succeed in his court-packing effort, it is likely that he would need to be reelected for a second term and democrats would have to control both chambers of government. In order to secures outcomes that favor the democratic party, the President most then nominate four candidates whose judicial philosophy would yield outcomes to his liking. Republicans are not likely to allow such a maneuver without contestation. Ultimately, in Marbury-like fashion, the United States Supreme Court may have to rule on a matter that pertains to itself

whether the principle of separation of powers protects the United States Supreme Court from the whims of the political party in control or whether legislative branch of government has the right to determine the size of the Court whenever it wishes. The Court, I suspect, will rule in favor of its own preservation, introducing a new construct of judicial scrutiny and employing original intent analysis, to ultimately opine that the legislature has a right to resize the membership of individual court the number of courts systemwide when absolutely necessary to enhance the efficiency of the court system, and not done for the purpose of achieving partisan ideological ends.

Conclusion

There is no crystal ball which allows for clear insight into the future. What is more plausible to deduce is the fact that the nature of American culture in the public square is likely to have a trickledown effect on the culture of public schools. Behaviors, “moral” or “immoral”, that are deemed constitutionally permissible by the Supreme and federal courts are likely to appear in public school curriculum and endorsed as legitimate practices of the schoolhouse. With voting rights and abortion on the political bubble, a butting of political and judicial heads is inevitable.

In preparation for what seems to be an inevitable collision course, educators, churches, and anyone else so interested, would be well served by understanding the impact of court packing on the religion in public school and social life in general. The United States is no longer the over whelming White and Protestant. Other religions such as Islam, Hinduism, and atheism have become more prevalent in recent years. Parents and religious organization, throughout the country, are asking that accommodations be made for non-protestant religious expression in public schools. There are also quests for the acknowledgment and celebration of non-Protestant religious holidays. Although originalism may carry the vote on the Supreme Court ideologically, justices who use the interpretive method would, for sure, face a wider hermeneutical gap. While the framers could not likely have conceived of “one nation, under Buddha, indivisible,” the Supreme Court must consider the possibly that such a change in the school pledge be might be requested. Upon such an occasion, some judicial philosophy must apply.

All judicial interpretive methods are susceptible to subjectivism, judicial restraint notwithstanding. It is certainly true that the use of originalism up until the mid-1950s had generally favored Judeo-Christian religion and an identification with the Christian heritage of early America. But America has change in many ways, including the manner in which multiculturalism is acknowledged and celebrated. The religious and ethnic changes in the United States have afforded current conservative Supreme Court justices and the President's nominee to view original intent in light of how the Constitution has evolved. In doing so, what the Court may find is that the interpretive method, even with the use of lower abstract principles, is only plausible within a limited scope of applicability. Raising abstract principles beyond such plausible limited scopes may lead to court opinions that could be viewed as judicial fiction, rather than renderings that embed the original intent of the framers.

Despite the subjectivism inherent in original intent, moral philosophy, textualism, structural analysis, and stare decisis, Supreme Court justices and nominees a free to embrace one or all of them. What seems to be more important than the labels of the interpretive method, is the liberal or conservative ideological persuasion that justices bring to the court. The apparent correlative associations between interpretive methods and outcomes seems to be more perceptual rather than substantive. Justices seem to be able to reach liberal or conservative outcomes regardless of the interpretive methods selected. What should be the public response in like of such subjectivism?

There is something that all interested constituencies can do in response to court nominations and local elections of judges. Empower yourself with information about the judicial candidate. Try to find out what political party or associations to which they might affiliate. Seek to determine whether they belong to a religious organization. Review speeches and written opinions of the candidate. Become as politically active as much as possible in the process of court appointments and judicial elections, at all levels. Then cross your fingers or pray, or both!

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Chapter 2 - Critical Interpretation of A Non-Creative Supervision Practice for Ph.D. Students

Amjad Almusaed, Asaad Almssad, Marisol Rico Cortez

Chapter Highlights

- Ph.D. students need to be supervised by someone with an international reputation so that the name on the recommendation letter carries weight. But they also must not be professors traveling from place to place, frequently leaving campus, and missing mentoring sessions to advance their careers.
- They have to be recognized, well-known, but also able to guide you without constantly refusing to meet you just because you have to take outside of the university.
- Many students affirm that they never received any satisfactory, effective, or useful guidance during the study. The student in Ph.D. research-level needs to have the right to choose a supervisor with whom he has a good relationship. However, as the bureaucracy in graduate management at universities increases, administrators and administrators' "pair" prospective doctoral students with supervisors more and more frequently.
- That will create bad cooperation and an uncreative scientifical product. A good supervisor-student relationship requires the joint efforts of both parties. Many Ph.D. students get into unnecessary trouble because they make some very common mistakes in their relationship with their supervisors. Unfortunately, our experience tells us that many students do not think deeply about this relationship and that most problems are predictable and avoidable.
- The study aims to interpret the negative action of supervisor practices of Ph.D. students during the supervising phasis and will classify the critical factors and types of a bad Ph.D. supervision.

Introduction

Ph.D. is an acronym that stands for Doctor of Philosophy. This is the highest academic degree awarded in several foreign countries (Stewart Manley, 2019). It is received by a graduate of the third level of higher education (according to the Bologna system), who has prepared and defended a dissertation. The owner of a Doctor of Philosophy does not necessarily have to study "Philosophy". The so-called Doctor of Philosophy means that the owner has a considerable understanding of the theory, content, and development of its knowledge field, can conduct research independently, and make achievements in the academic field in this field (Aameri, B., 2016). The Doctor of Philosophy (PhD)-education is a research training which aims to prepare the doctoral student to become an independent researcher who can make significant contributions to academia and/or industry.

Quality supervision, according to Latona and Browne (2001), may be characterized as requiring precise and timely response, frequent encounters. That include open debate about responsibilities and duties, a supportive and collegial connection, and support to begin working on topics of interest early in the program to maintain the flow of work throughout the program (Latona, K., & Browne, M., 2001). Over the past decade, there has been a considerable resurgence of interest in the role of creativity in educational and organizational contexts and in understanding the conditions and processes that appear to enable creativity (Denise W., Dorothy F., Dorothy M., 2008). Interventions in the quality of research training provided in universities today focus largely on educating supervisors and monitoring their performance as well as the student progress (Lesley Johnson, Alison Lee & Bill Green, 2000) The dilemma for supervisors and their students is that little advice is provided in the training programs of PhD students or supervisors on how to develop these qualities (Denise W., Dorothy F., Dorothy M., 2008). Interdisciplinary supervision strengthens unity and a holistic view in students' communities, which are composed across disciplines. According to (Holligan, 2005, p. 276), one view of doctoral study is that it is essentially a system of training in both technical and intellectual skills, the possession of which will ultimately lead to original contributions.

In everyday life, there may be a tendency for the various students' communities to close in on their research target perspective, which can lead to contradictions and conceptual-

struggles (Romane Viennet, Beatriz Pont, 2017). Interdisciplinary supervision leads to scientific differences becoming a resource that can benefit the research communities. It not only creates learning and new opportunities for action in relation to everyday complex challenges. At the same time, it is an effective Ph.D. student's development, which is based on the work with the core task (Anne Lee, 2008). The study aims to find and discuss the negative aspects of doctoral supervising, which many of Ph.D. student around the worlds suffering.

Supervisors, Supervising and Creative Supervision within Practices

Supervision is usually carried out by a supervisor - a qualified consultant who conducts supervision by professionally advising a consultant who has applied for supervision (Kevin D Forsyth, 2009). Relationship work is complex and unpredictable because it involves student communities. It regards problems as something unique that takes place in the relationship between doctoral student and supervisor. The tutorial has a touch of personal development. The supervisor helps doctoral students to reflect on their personal patterns and how they act as professionals and as human beings. (Al Makhamreh, M. and Stockley, D., 2020). The relationship between the supervisor and the Ph.D. student is built on the wrong basis. The supervisor often "runs" after the Ph.D. student, seeks sections from him, approves the unfulfilled individual plan of the Ph.D. student. Working with a Ph.D. student is purely individual. It brings the necessary results if there is mutual understanding. The supervisor helps the Ph.D. student to understand the problem, give it a scientific interpretation, gain the necessary knowledge and skills of research work, writing scientific articles.

The correct selection of the supervisor depends on the work of the Ph.D. Student on the dissertation, its result (Natalia M., Nina B., Larisa D., 2015). Of no small importance is the psychological compatibility of these two people. Of course, the supervisor is selected considering the topic of dissertation research. The selection of a supervisor is carried out by the department. But it is possible (and this is very important) that the Ph.D. student himself will propose a supervisor. For a Ph.D. student, the value of a supervisor is the ability to constantly receive consultations, advice, recommendations, to experiment together (Paul, Pauline, Olson, Joanne K. and Gul, Raisa B.. 2014). Student should, taking the opportunity, "exploit" the scientific erudition, knowledge, experience of the supervisor, and not hope that he will pull him out at the defense of the dissertation. The mission of the supervisor is to help

the Ph.D. student to acquire the skills of a researcher, to study the topic from a deeply scientific position, to delve into its theoretical and practical aspects, to determine new facets of its study, to identify trends, patterns in the development of the phenomenon under study, to help expand the source base as much as possible and use it to reveal the scientific topic. A Ph.D. student should be in constant business contact with the supervisor (Bhattacherjee, Anol, 2012).

Many specialists believe that it is better to be known as annoying than inert, passive. First, it must be said about those who are engaged in daily Ph.D. studies. It is difficult for Ph.D. students to work with them, feeling under constant control. Of course, everything should be within reasonable limits, but we are sure that later his student will only be grateful to such a scientist. But if a Ph.D. student goes the independent way, this is his business, in the end, he is interested in completing the dissertation and its successful defense (Anna Sverdlik, Nathan C. Hall, Lynn McAlpine, Kyle Hubbard 2018). As it seems to us, recently there are scientific advisers, whose names are put on dissertations "by agreement". Previously, this was reported to when publishing monographs - the mention of a major scientist on the title as a scientific editor who carried out a "general editorial" created a certain authority for the publication.

The management of Ph.D. students do not require much trouble, that this work does not require significant knowledge, a lot of time and work, pedagogical experience, methodological skill has not been eliminated. Working with Ph.D students is immeasurably more difficult than with students if you treat it correctly and responsibly. Supervisors are not required to be the guardians of Ph.D students, but it is wrong to let their theoretical and practical training run its course (Anna D. Rowe, Karsten E. Zegwaard, 2017).

Problems Confronting Doctoral Students

Most Ph.D. Supervisors have excellent morality, but there will still be much moral corruption in the academic atmosphere. It is also unavoidable. In recent years, many Ph.D. Theresa M., Jude C. thought that supervisors have abused their power to allow students to do things beyond degree research, and the system introduced by the universities for solving this problem, although this system can solve the problem of doctoral students to a large extent (Theresa M., Jude C., 2008).

The problem of abuse of power by mentors can also cause some unavoidable disadvantages (See Figure 1). I hope that students can tell the supervisors one day: I'm sorry, I don't like your research direction. Or someone can specifically deal with the continuous situation of supervisors' academic misconduct, make supervision transparent, make the processing mechanism simple, fair, and effective, and lay off academic scumbags.

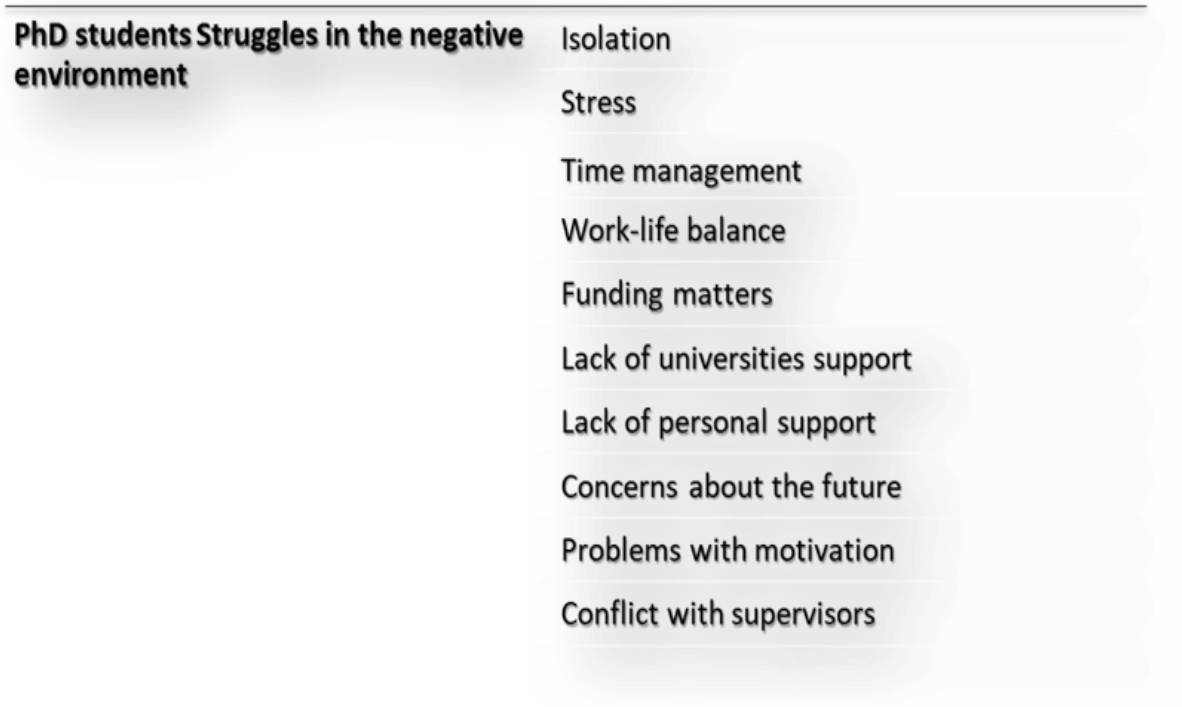

Figure 1. Student Sense in a Negative Supervision Environment (Amjad)

Conflict with the supervisor is the most crucial factor in the struggles of the students. Which may lead to the problem with motivation and stress, and negative sentiment.

A bad Ph.D. supervision in practices

Abusive Supervision

The consequences of abusing supervisory behavior based on the theory of justice. Bennett j. Tepper affirmed that Abusive supervision was associated with the lower supervising manner and non-cooperation, low Ph.D. student satisfaction, lower normative and emotional commitment, greater ongoing commitment, workplace conflict, and psychological distress for supervisors. (Bennett J. Tepper, 2000).

Figure 2. Abuse Stages and Reflection on Ph.D. Students

A Ph.D. supervisor with an abusive supervision style may respond in a disrespectful way, can humiliate students, responsibility other students for their personal errors, and/or break promises (See Figure 2). Abusive supervision is most often studied in the context of the study place. Abuse of supervision has been investigated as a precursor to negative performance outcomes for supervisors. Hanig S, et al think that the abusive supervision is a one-dimensional construct; however, it has recently been found that it is a four-dimensional construct. The abusive supervision is a four-dimensional construct in which yelling, behavior humiliation, scapegoats, and credit theft are described as dimensions of abusive supervision. Research on abusive supervision is imbalanced in two ways (Hanig S, Yang SW, Liang LH, Brown DJ, Lian H. 2021). Wang, G., Harms, P. D., & Mackey, J. D. classified that in two categories; first, with most research attention focused on the destructive consequences of abusive supervision, Second, with most research on abusive supervision centered on its main effects and the moderating effects of supervisor-related factors (Wang, G., Harms, P. D., & Mackey, J. D., 2014). Deviation in the study places is closely related to abuse of supervision. Abusive supervision is defined as students' perception of the supervisors to which they consistently display hostile verbal and non-verbal behavior. This can be when supervisors ridicule their students, show them a taciturn attitude, remind them of past failures, neglect them, place blame inappropriately, or explode into temper tantrums. It may seem that students who have been abused by their supervisors will either retaliate directly or leave by quitting their studies. In fact, many turn against their students by displaying organizational deviant behavior. Because supervisors' control many of the university's resources, they often

use or abuse everything they can. This misuse of resources can manifest itself in the form of time, office supplies, raw materials, finished products, or the services they provide.

Ambiguous Supervision

A supervising is ambiguous when the supervisor's comments and the supervising input process, are not clear with no prior of which of the selective orientation, subjects, research questions are correct. Ghadirian L, et al., thinks that the lack of knowledge and competencies created by ambiguous supervision and inadequate and appropriate feedback to students during the thesis supervising process. As well as inappropriate discussions about the thesis subjects and the supervisory process by the supervisor to guide the student. This will lead to a lack of familiarity with research methodology and science writing. (Ghadirian L, et al., 2014). An inappropriate research environment, which leads to a lack of motivation of students towards research activities, can lead to a devaluation of the supervision of theses and a lack of promotion of the effort of skills in this field.

Autocratic Supervision (Supervisory Control)

The dark or destructive side of supervision behavior has attracted the attention of many universities and Ph.D. supervising guides in recent years. Autocratic supervisors refer to the leadership that stresses the use of authority to control Ph.D. students (Cheng, M. Y., & Wang, L., 2015). Wang, Z., Liu, Y. & Liu, S, conclude that because, autocratic supervision has a negative connotation in the literature; this type of leadership is negatively related to students' attitudes, emotions, and perceptions. (Wang, Z., Liu, Y. & Liu, S., 2019).

An autocratic supervision or supervisory control or refers to the control of many individual aspects or total control of research loops. Autocratic supervision, also known as autocratic supervisor, is characterized by individual control over all decisions and little input from group members. Autocratic supervisors typically make choices based on their ideas and judgments and rarely accept advice from followers (See Figure 3). Under this type, the supervisor wields absolute power and wants complete obedience from his subordinates. Ph.D. students with a controlling supervisor haven't control of their work, and they are not allowed to make any research choices on their topic.

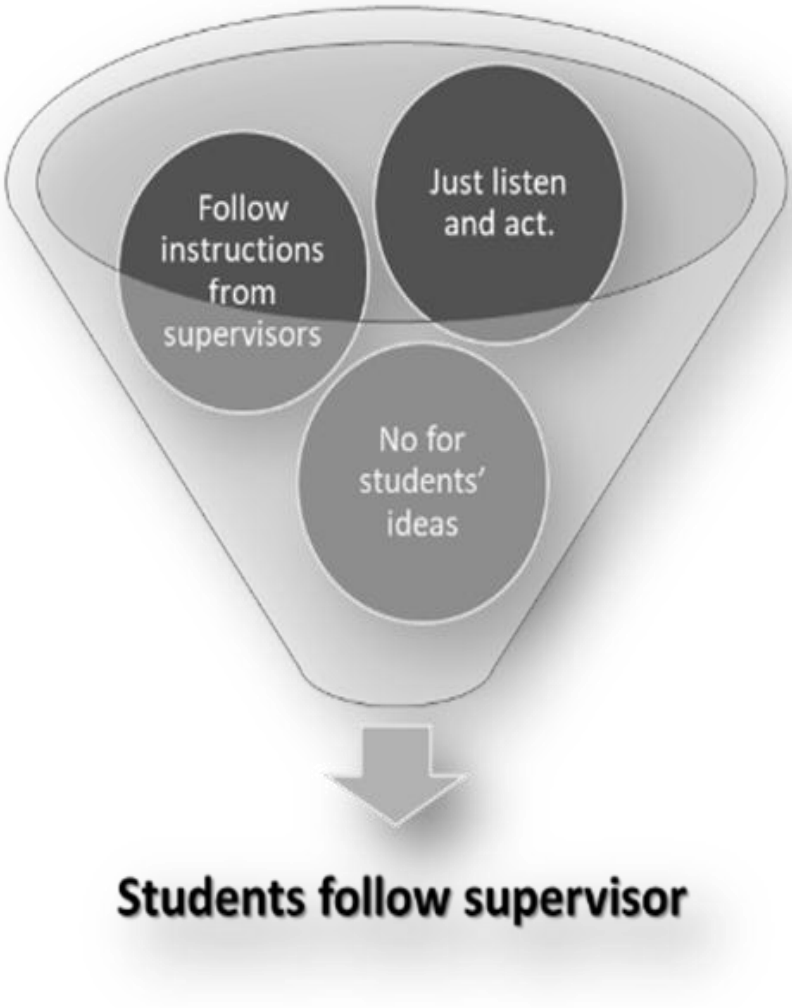

Figure 3. Supervisory Control (autocratic supervision) action

This kind of supervising refers to monitoring all process controllers at a higher level, not necessarily for the operation of each controller, but to provide the operator with the overall process situation and integrate the operations between the controllers. Hannah Snyder thought that they could not choose their topic for their publishing materials, the methodology or theoretical perspective they will use, or how they manage their project. Although building any doctoral research on and relating it to existing knowledge is the building block of Research communities and activities, regardless of discipline. Therefore, it needs to be done accurately should be a priority for all students (Hannah Snyder, 2019). This is either because they are told explicitly that they are not allowed to make their own choices, because they are told what to do without negotiation, or because their ideas are torpedoed until the supervisors' ways are 'chosen' the Ph.D. student. It represents a system mainly used negatively in supervising process (See Figure 4).

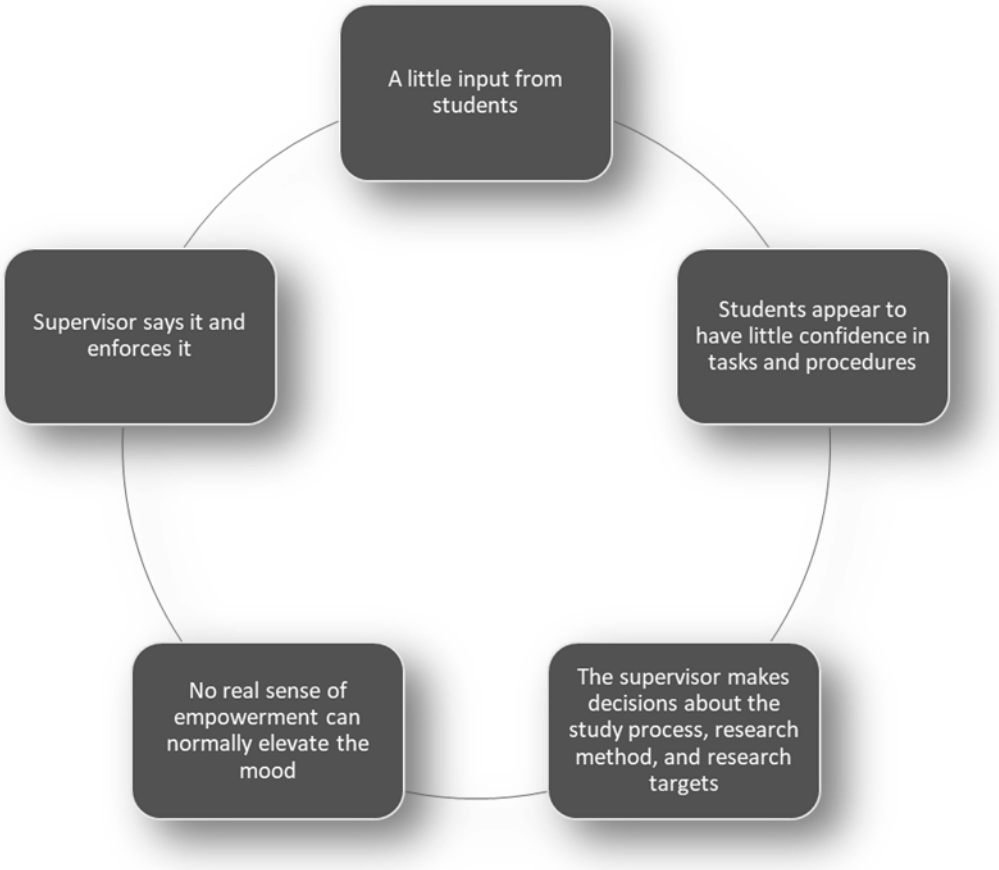

Figure 4. Typical features of the Supervisory Control

Passive Supervision

Active supervision, in general, creates a significant opportunity for creative action for research. Ph.D. supervision is associated with different expectations and responsibilities from both the student and the supervisor, but there is no single approach to the supervisor relationship (Christopher R. Madan, 2021). A passive supervisor does not like to make decisions and only intervenes in cases where there are severe or chronic problems. This type of supervision is characteristic of Inactivity, passivity, lack of trust, conservatism, and closeness. Loae Fakhri J , confirm that the supervisor resists any proposal from students for changing new lines of technology and methods. It represents a style of supervision that can be seen as the opposite of autocratic supervision. Supervision may not even be the appropriate term here, because it is characterized by an absence of guidance and avoidance of involvement (Loae Fakhri J., 2018). Sometimes, passive supervision is not a supervisor characteristic, but a period during which the supervisor loses interest in the doctoral thesis's student. Igwe, P.A et. al. thinks that the passive supervisor is supervisor who processes the

Ph. D students wrongly, where they do not criticize the work of students, but some supervisors go too far. Passive supervision is associated with more psychological distress among PhD students. They make students feel blamed for the study's results and feel emotionally detached. they also get the impression that their work does not cover the subject of the thesis (Igwe, P.A., Rahman, M., Ohalehi, P., Amaugo, A. and Anigbo, J.A., 2020). Oftentimes, they are afraid and cannot talk to the department manager. They feel weak in carrying out their responsibilities.

Apathetic Supervision

Apathy is a symptom, or a temporary mental state characterized by indifference, emotional coldness and indifference. It is manifested by indifference, detachment from what is happening, lack of motivation for any activity, decrease in emotions and slowness of actions. Supervisors who show up in the body but are inattentive or unaware about what is going on with their students, or even the university. They failed in the supervising process, and they accept whatever level of performance their students choose to give. The basic psychological mechanism of apathy in the supervising process is the depletion of mental energy reserves to help Ph.D. students (emotions, motives, involvement). Cropanzano, R., Weiss, H.M. and Elias, S.M confirm that a healthy supervising process and indifference are the results of prolonged excitation of the central nervous system (Cropanzano, R., Weiss, H.M. and Elias, S.M. 2003). A thesis supervisor with an apathetic supervisory style lacks commitment or passion for supervision, research and the student. This type of supervisor may use "shortcuts" in the search or not be interested in following the latest developments in the research discipline. Apathetic supervisions are not happy, nor are they disgruntled they're just there. Supervisions that have become apathetic typically go through their daily supervision requirements and missions, doing only the minimum required to complete targets, remaining detached from the research process. One real risk of apathetic supervision is that doctoral students get apathetic as well.

Ghost Supervision

Regarding this category of supervision Diana F Davis, thought that the ghost supervision reflects the supervisor, who is not around to help ph.d students much. It is the opposite of the previous type. It also appears as a more common one and can also occur when a Ph.D.

supervisor has many tasks to fulfill or too many students to supervise (Diana F Davis, 2019). The “ghost supervisor” is invisible, very rarely responding to emails, somebody who can be seen just seldom. For students who need more engagement and support, this type of supervision can turn into a nightmare, where students should grow into independent researchers and should be able to find solutions to problems alone. Almusaed conclude that there should always be a balance between constantly seeking the advice of the supervisor for every small problem and being left alone without any support at all (Almusaed, A. & Almssad, A., 2020).

Arrogant Supervision

Arrogant supervision represents a negative form of communication between the doctoral student and his/her supervisor in the supervision process. Where the supervisor regularly looks over the shoulders of the students, which can be an issue like passive supervision. Borden, L., Levy, P.E. & Silverman, S.B thought that arrogance is typically rooted in feelings of insecurity and used in the structure of the ego as a justification for mitigating such atrocious emotions (Borden, L., Levy, P.E. & Silverman, S.B., 2018). This comportment can be clarified by two scenarios:

- They are new supervisors who do not realize how to delegate or are over-compensating for their own inexperience
- They are control freaks

Because they think that if they're arrogant, they're going to communicate that they're in charge. Good supervision doesn't need to show arrogance.

Bureaucratic Strict Supervision

Kate N. Tibagwa,, David Onen, & Joseph Oonyu , affirm that the bureaucratic supervision represents a bad supervising, useless activity, waiting hours for taking initiative for the research process, forms that have already been canceled, and attempts to fight the research field (Kate N. Tibagwa,, David Onen, & Joseph Oonyu, 2016). The root cause of all these negative phenomena is not the bureaucracy as such, but shortcomings in the implementation of the rules of work and the goals of the universities or supervisors, the usual difficulties

associated with the size of the organization, the behavior of employees that do not correspond to the rules and objectives of the universities. Under this form certain working rules and guidelines are laid down by the supervisor and all the aides are required to follow these rules and procedures very closely. A serious mention of the violation of these rules and laws is taken by the supervisor. Callahan R.F. explain that the bureaucratic supervision relies on a clear instructions, restrictions, and chain of command, strict regulations, and compliance by Ph.D. Students (Callahan R.F., 2017). The main difference is that, with the former, the focus is on the leader who is responsible for making all the key decisions (see figure 5)

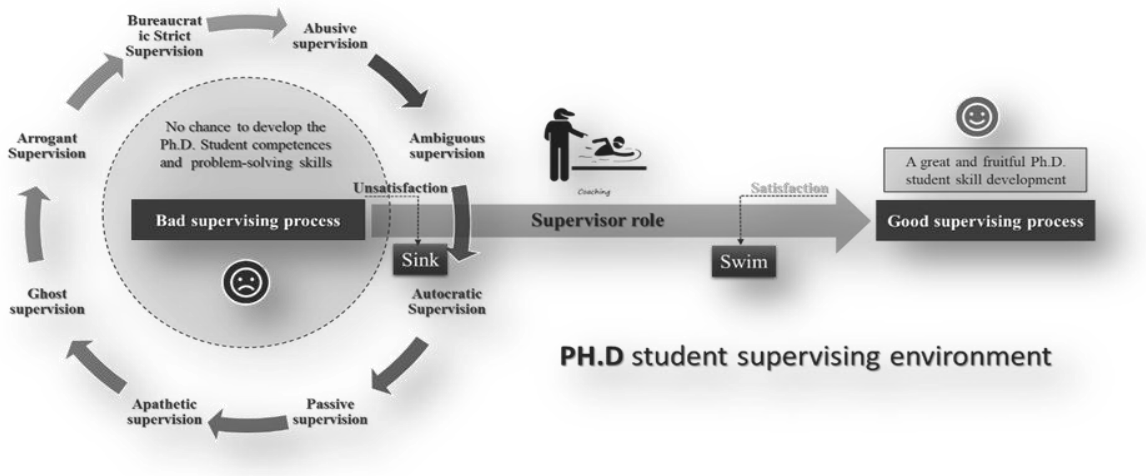

Figure 5: The Ph.D. students' supervising environment and categories

These categories of supervision are generally classified according to the behavior of supervisors towards their students. It is also not a full typology of bad Ph.D. supervision practices, but these seven types stood out in the literature that We found about bad Ph.D. supervision.

Survey and Analysis

A survey made between Ph.D. students from different universities from Africa, America, Asia and part of Europe. Ph.D. students were selected from different areas (Engineering, Business, Economy, etc) from the beginning until the last year of their doctorate. 45% of the respondents are studying in their first and second year, 13% are in the third and fourth year and the 9% are in their last year. In average The Ph.D. students have been met from 3 to 25 times with their supervisors per semester. More than 17% of respondents expressed that

supervisors are often very busy, where just over a 21% of Ph.D. students receive few assistance, the lowest has been 3 times per semester.

Survey showed that 17% of Ph.D. students feel negative regarding supervising. Passive supervision was the most common negative kind of supervision 17%, followed by authocratic supervision with 13%, abusive, apathetic ghost and bureaucratic strict supervision obtained 6% respectively.

Bad communication, bad supervising interaction, inconsistencies between opinions of the supervisors might become troublesome in knowing who to listen to, slow feedback. The lack of Gender equality still happen for instance, sexist comments/jokes. COVID has been found as another negative aspect during the Phd.
The lack of need for mutual scientific communication is a serious drawback in the training of Ph.d students. Moreover, 36% said that their supervisor has been helpful and the 21% said that their supervisor hasn't been helpful. and finally, 48% of respondents are satisfied whit doctorate experience.

Results Discussion

The supervisor required role

A. Kolmos, L. B. Kofoed & X. Y. Du , think that a lot of supervising Ph.D. specialists think that a good supervisor needs to work with their students in a friendly environment (A. Kolmos, L. B. Kofoed & X. Y. Du, 2008). And he has to support his students through all studies stages, both technically as well as personally, that because the negative feeling that a major part of students gets disheartened because of the scientifically work, which in some time not going as planned when they need moral support. In another hand, good supervising is to encourage and allow the student to take independent decisions about the research and then critique them friendly, which can help them to become a better independent researcher. Christine Halse & Janne Malfroy consider that many specialists in Ph.D. supervising think that a good supervisor requires to work with his student, in a friendly environment and he has to support his students through all studies stages, both technically as well as personally, that because the negative feeling that a major part of students get disheartened because of the scientifically work, which in some time not going as planned when they need moral support (Christine Halse & Janne Malfroy, 2010). In another hand, good supervising is to encourage

and allow the student to take independent decisions about the research and then critique them friendly, which can help them to become a better independent researcher. The supervisor bears full responsibility both for the level of theoretical training of the Ph.D. Student and the timeliness of the submission of the dissertation and for its content. The dissertation is a kind of mirror not only of the Ph.D. student but also of his supervisor. The supervisor bears full responsibility both for the level of theoretical training of the Ph.D. student and the timeliness of the submission of the dissertation and for its content. The dissertation is a kind of mirror not only of the Ph.D. student but also of his supervisor.

Adair, John G., and N. Vohra. thought that the supervisor assists the Ph.D. student, among other things, in drawing up a work plan and a schedule for working on a dissertation. It helps a novice researcher to master the methodology of researching a topic, problem, phenomenon (Adair, John G., and N. Vohra, 2003). His duty includes the disclosure of the mechanism of work on the dissertation. He recommends (at first) the necessary literature for fundamental study, reference, statistical and other publications, suggests how to get into the archives and find exactly what you need there. A good supervisor is a guide and mentor, not an encyclopedia or a self-help book. Many Ph.D. students are not satisfied with their supervisors. The positive role of the supervisor is to:

- Support the student through all stages of work both technically as well as personally (Almusaed, A., Almssad, A., & Cortez, M. R., 2021).
- Many times, students get disheartened because of the work not going as planned when they need moral support.
- Allow the student to take independent decisions about the research and then critique them so that the student can become a better independent researcher.

Collaboration, availability of funds, and facilitation in papers publication are the key features that must be contained in an active and productive Ph.D. supervisor have to be knowledgeable, cooperative, compassionate, flexible, supportive, inspirational, selfless, and have enough time for the supervising. The supervisor is obliged to write an official review of the completed dissertation and submit it for defense. He is the first scientist who testifies that the dissertation meets the requirements of the Higher Attestation Commission. Scientific

supervision of Ph.D. students is the most important part of the training of highly qualified specialists.

Murphy E, Dingwall R, Greatbatch D, Parker S, Watson P consider that if qualitative results are not achieved in this matter by departments with doctoral studies, with the current increase in recruitment, not only the overall level of work will decrease, but there will also be serious failures in conducting timely dissertation defenses (Murphy E, Dingwall R, Greatbatch D, Parker S, Watson P, 1999).

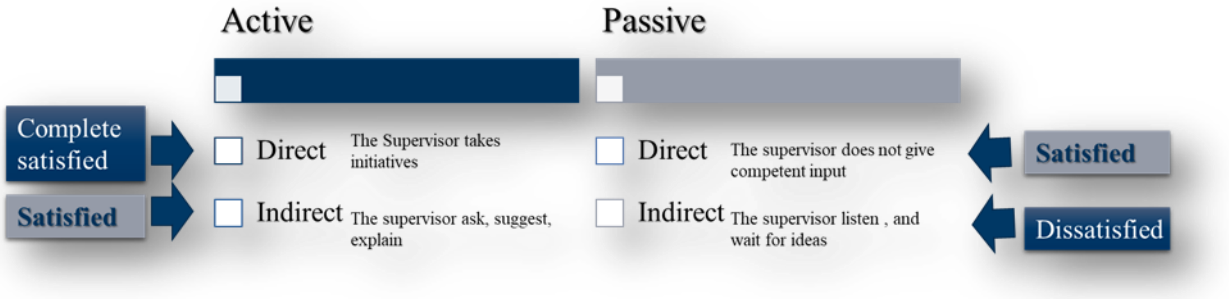

Figure 6: Supervisor - PhD Student interactions

A good supervising process can be realized by making a transformation in communication to rebuild another level useful for the new study stage; supervisors can provide the new stage and then the process just if he is knowledgeable, cooperative, compassionate, flexible, supportive, inspirational, selfless, and have enough time for the supervisor (see figure 6). Wichmann-Hansen G., Bach L.W., Eika B., Mulvany M.J. thought that the supervisor has to guide his student to manage Ph.D. student plan, in which way have to do the research task, to be clear and can cover the topic area, he can tell the student what information is required and help him to write a list of questions that are required to “lookup.”

Supervisors can provide the Ph.D. student with guidance and assistance related to study, planning, and how to manage the time and presenting the task of research to make the study atmosphere to the best advantage (Wichmann-Hansen G., Bach L.W., Eika B., Mulvany M.J., 2012). Supervisors have to build a strategy with his Ph.D. students from the start, with not too much information in the first meeting, the first time the student has to read a lot of articles, literature, etc. not to describe the problem that he had, he has to think about the study process. He has to know about the big area of the subject and what. It became healthy when

Ph.D. Students talk about what they think, related to subjects, what they like to use, text, method, and other subjects related to the topic.

Ph.D. Students position in pad supervising environment

The real research area for many specialists in supervising area is to establish an investigation environment that stimulates the students to work on their research with enthusiasm, leading to research results. Where all the time that Ph.D. is a big subject area is not a meal reservation at a restaurant or making a phone call and canceling it. The study in Ph.D. is based on a contract whose violation morally disqualifies the person who commits it. With a Ph.D., the study involves originality honor. It's just that the Ph.D., like any university degree, is a black-and-white thing. There is a minimum of criteria to be met for granting it. If they were not met and the title was still allowed. The research has to interact positively with the community, where good research works with community requirements, where the academy would incentivize scholars to improve society, not chase citations. Ross-Hellauer, et al, confirm that the research has to be designed not to win kudos within the academic community but rather to discover something new that will be useful for practitioners and have a real social impact (Ross-Hellauer , et al., 2020).

Conclusion

In the process of researching the chosen topic, many factors are essential: knowledge of the problem (topic), the interest of the applicant, his willingness to strictly follow the advice of the supervisor, and at the same time take the initiative. It is essential that the initiative is accompanied by the collection of new information, which would serve as a confirmation of the hypothesis and encourage the supervisor and Ph.D. student to have creative discussions. The role of the supervisor in the preparation of dissertations by doctoral students is well known:

- A deep respect for the opinion of a Ph.D. student and a doctoral student - from the moment they met until the defense of the dissertation.
- Providing all kinds of assistance in a deep understanding of the topic of dissertation research.

- Work according to a jointly defined plan, which should be as detailed and concretized as possible in time, which contributes to discipline, self-organization, and the supervisor (consultant) and his ward.
- Current (outside the regulation) working relationships, where the initiative is mainly for doctoral students.
- Practical assistance in formulating provisions, conclusions, in the scientific presentation of a fact (document) and its comprehension.
- Transfer of your experience in the search for materials.
- Developing a Ph.D student's ability to correctly draw up the scientific apparatus, a respectful attitude "to dots and dashes."

Supervisors should ensure that they undertake training as part of their continuing professional development to support their work as a supervisor. In addition, supervisors should take the initiative in updating their knowledge and skills by participating in a range of appropriate activities and sharing good practice.

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Chapter 3 - Accreditation towards the Internationalization of the Professions Staged on Industrial Revolution (IR) 4.0 Academic Milieu amidst the COVID-19 Pandemic

Dr. Janet R. Valdez, Dr. Mark Rey C. Santos

Chapter Highlights

- With the opportunities for improvement provided by the prestigious and credible accrediting bodies, academic institutions unceasingly provide education that comes close with peoples of diverse cultures through collaborative internationalization endeavors; education that allows mobility of students and faculty members opening opportunities for the influx of innovative ideas and creative learning; and education that bridges the gap among social classes and strata.
- The kind of education born in the 4IR can be matched by the tools provided by the fast-changing technology which benefits the students of this generation.
- Hence, the main concern of the study was to determine the relationship between the perceptions on the accreditation process and internationalization of the professions staged on Industrial Revolution 4.0 amidst the COVID-19 pandemic.
- The study utilized a descriptive correlational research design which quantified data through aset of standardized instruments administered through a universal sampling technique.

Introduction

Educational institutions are shaped and reshaped depending on the cultural setting. Currently, two (2) unexpected catalysts for change namely: the Industrial Revolution (IR) 4.0 and COVID-19 pandemic necessitated drastic shifts in educational paradigms.

The common buzzword in the contemporary educational milieu is Industrial Revolution 4.0 or 4IR, the strength of which according to Hussin (2018) should make change inevitable. The change rippled far and wide covering the educational arena; thus, Ovinova & Shraiber (2019) created a model of the educational process catering to Industrial Revolution 4.0 which integrates information technologies into different spheres of human life. IR 4.0 connects the digital and biological landscapes allowing movement and technological innovation in the virtual realm. With the Web 3.0, the web designed to interconnection or semantic web, dynamic educational institutions innovate as borderless, virtual, and global to address student mobility through various forms of internationalization. Moreover, contemporary learners breathe digital technology and mobile connectivity unknowing of the sphere without them. Education in the 4IR, therefore, rests to address the needs and potentials of the learners who are not only technologically-savvy; but, thrive on heavy dependence on digital and smart technologies; thus, Almeida and Simoes (2019) suggested learning by doing through experimentation and greater interactivity among stakeholders in the educational environment.

Aside from the adjustments to the fast-changing technology brought by IR 4.0, the world was caught unprepared with the global pandemic caused by the scare and spread of the novel Corona virus 19 or COVID-19. COVID-19 is short for Coronavirus disease 2019. It is an illness caused by a coronavirus named SARS-CoV-2 or COVID-19 which appeared in Wuhan, China in the late 2019 (Hansen, 2020). Brammer et al. (2020) described the profound effect on social and economic aspects such as: closure of borders; banning of mass gatherings; and enforced social distancing. Verlegh et al. (2021) revealed that the COVID-19 pandemic increased consumers' worries and made them lose their control over their lives.

The two (2) catalytic settings: IR 4.0 and COVID-19 did not prevent educational institutions to submit to accreditation process. Competing credible and highly renowned accrediting organizations and bodies continue to fathom excellence and quality on various areas. Academic institutions maintain their trust on the accreditation process which is aimed at

finding recommendations and actions for the improvement on the delivery of products and services. The Council for Higher Education Accreditation (CHEA) International Quality Group (CIQG) (2019) framed and explored the academic quality in relation to the future of higher education and accreditation. Higher education diversifies due to the influx of emerging trends, especially as offshoots of the global experience of the COVID-19 pandemic. Traditions were bridged. Educational paradigms shifted; hence, the necessity of accreditation to establish the equilibrium on the search for quality and excellence. Alaskar et al. (2019) found the high perceptions of process and purpose of institutional accreditation as significant predictors of motivation and involvement among participants in the accreditation process. Interestingly, it was also observed that the perception of purpose was significantly higher in government than private institutions. Barzansky et al. (2015) identified the factors that affected the implementation of continuous quality improvement and concluded that accreditation can enhance educational program quality and outcomes.

The paradigm shift in education necessitated a parallel need for parameters quantifying and qualifying the unavoidable change; thus, academic institutions searched for accreditations. Accreditation answers the cry for quality (Flores & Center for American Progress, 2019; Tapilatu et al., 2018; Cohen & Kisker, 2010 as cited in Flood & Roberts, 2017), status and prestige (Hail et al., 2019), a tool for promoting institutional improvement and excellence (Bloand, 2001; Lubinescu et al., 2001; Wheelan & Elgart, 2015 as cited in Flood & Roberts, 2017). Public and private schools, especially Higher Educational Institutions (HEIs), partnered with external accrediting bodies like the Philippine Association of Colleges and Universities Commission on Accreditation (PACUCOA) ensuring quality and visualizing recognition by similarly competitive national and international academic organizations.

The private Catholic higher educational institution (HEI), with its current commitment on the trifocal functions of globally-comparable quality instruction, genuinely-utilized research productivity, and research-based community extension anchored on the Catholic Augustinian- Marian vision and mission, walks with the rest of the world in the new educational era. The private Catholic HEI, with its unceasing pursuit for excellence, partners with accrediting bodies in identifying opportunities for improvement in different areas of the academe which ensure perpetual progress. Thus, the private Catholic HEI offers education that comes close with peoples of diverse cultures through collaborative internationalization endeavors; education that allows mobility of students and faculty members opening

opportunities for the influx of innovative ideas and creative learning; and education that bridges the gap among social classes and strata. The kind of education born in the 4IR can be matched by the tools provided by the fast-changing technology which benefits the students of this generation. The Catholic HEI's education is truly a continuous struggle in maintaining its culture of commitment because as what Aristotle once said, "Excellence is not an act; but a habit."

Hence, this study hoped to determine the relationship between the perceptions on the accreditation process and the internationalization of the professions staged on Industrial Revolution 4.0 academic milieu amidst the COVID-19 pandemic.

Theoretical/Conceptual Framework

The study was anchored on the National Quality Dialogue initiated by the Higher Education Accreditation (CHEA) (2019). It was a series of regional and national meetings, as well as, interviews with key administrations in the higher education. It was culminated with research and publications series. The Dialogue presented the future of higher education and accreditation by framing and exploring the academic quality. The diversification of higher education was observed through the emerging trends and educational experiences beyond the traditional. Five (5) significant factors of quality were explored namely: higher education and accreditation; research and policy instituted and foundations; alternative providers and alternative credentials; the federal government, and the employers.

Figure 1 shows the Conceptual Model of the Study. As can be gleaned from the same figure, the independent variable was the perceptions on accreditation, which was based on the responses of the personnel on the various aspects of the accreditation process namely: Institutional Relevance of Accreditation; Objectivity of Accreditation Evaluation; Internal Quality Unit Relevance for Accreditation; Value of Accreditation to Educational System; Continuous quality management; and Student Participation Value. On the other hand, the dependent variable was the internationalization of the professions, which was determined based on the dimensions such as: International Experiences; Foreign Language Ability; Academic Orientation; Assessment of Campus Climate; Faculty Involvement in Internationalization; and Attitudes and Beliefs About Internationalization.

The study aimed to determine the relationship between the perception on the accreditation process and the internationalization of the professions considering the current academic milieu submerged in the trends and shifts due to the Industrial Revolution 4.0 and the COVID-19 pandemic.

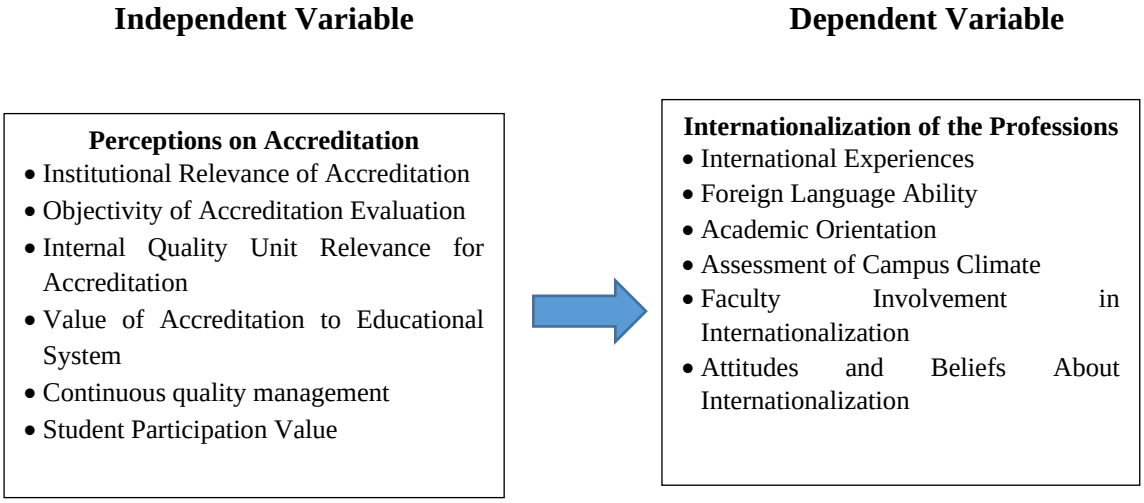

Figure 1. The Conceptual Model of the Study

Statement of the Problem

FroThe main concern of the study was to determine the relationship between the perceptions on the accreditation process and the internationalization of the professions during the Industrial Revolution (IR) 4.0 academic milieu amidst the COVID-19 pandemic. Specifically, the researchers aimed to find answers to the following questions:

1. How do institutional personnel perceive the accreditation process based on the following aspects:
    1.1 Institutional Relevance of Accreditation;
    1.2 Objectivity of Accreditation Evaluation;
    1.3 Internal Quality Unit Relevance for Accreditation;
    1.4 Value of Accreditation to Educational System;
    1.5 Continuous quality management; and
    1.6 Student Participation Value?
2. How may the internationalization of the profession be described based on the following dimensions:

2.1 International Experiences;

2.2 Foreign Language Ability;

2.3 Academic Orientation;

2.4 Assessment of Campus Climate;

2.5 Faculty Involvement in Internationalization; and

2.6 Attitudes and Beliefs About Internationalization?

3. Does a significant relationship exist between the perceptions on the accreditation process and the internationalization of the professions (In terms of academic orientation, assessment of campus climate, and attitudes and beliefs about internationalization)?

4. What is the role of accreditation on the internationalization of the professions?

5. What activities on the internationalization of professions may be proposed as accreditation standards based on the findings of the study?

Hypothesis of the Study

The null hypothesis was tested at 0.05 level of significance.
Ho1: No significant relationship exists between the perceptions on the accreditation process and the internationalization of the professions.

Scope and Delimitation

The focus of the study was the determination of the relationship between the perceptions on the accreditation process and the internationalization of the professions staged on Industrial Revolution 4.0 amidst the COVID-19 pandemic. Perceptions on the accreditation process was explored by asking the personnel from a higher educational institution to respond to provided statements as indicators of the aspects of the accreditation process such as: Institutional Relevance of Accreditation; Objectivity of Accreditation Evaluation; Internal Quality Unit Relevance for Accreditation; Value of Accreditation to Educational System; Continuous quality management; and Student Participation Value. On the other hand, the internationalization of the professions was described based on the following dimensions: International Experiences; Foreign Language Ability; Academic Orientation; Assessment of

Campus Climate; Faculty Involvement in Internationalization; and Attitudes and Beliefs about Internationalization.

Methodology of the Study

Methods and Techniques Used

The study utilized the descriptive correlational method of research to determine the relationship between the perceptions on the accreditation process and the internationalization of the professions. A descriptive research design characterizes or describes given variables using quantitative means or measurements. In this research, the perceptions on the accreditation process and the internationalization of the professions were quantified using weighted mean procedures and were interpreted using a set of descriptors. To evaluate the influence of the predictor variables to the criterion, a correlational study was employed in which the relationship between or among variables was assessed and determined (Joseph, 2014).

Succinctly, the main tasks of the study was to correlate the perceptions on the accreditation process and the internationalization of the professions. To accomplish this, the study utilized a quantitative research approach by deliberately measuring and analyzing quantitatively the subject variables. A quantitative study investigates specific phenomena by obtaining numerical data to objectively and effectively characterize the nature, relationship, and difference between and among variables.

A set of standardized questionnaire on the perceptions of the accreditation process and the internationalization of the professions was used as primary data gathering tools.

Respondents of the Study

The respondents of the study were the sixty-five (65) teaching personnel across the different departments and colleges of a private higher educational institution during the School Year 2021-2022, who specifically determined their perceptions on the accreditation process and the internationalization of the professions by responding to the set of standardized instruments. Table 1 shows the distribution of respondents for each department. As can be

gleaned from Table 1, the population of teacher-respondents from each department were as follows:

Basic Education Department (BED): 14 or 21.54%; College of Arts, Sciences, and Education (CASE): 11 or 16.92%; College of International Tourism and Hospitality Management (CITHM): 1 or 1.54%; College of Business, Entrepreneurship, and Accountancy (CBEA): 4 or 6.15%; College of Information Technology and Engineering (CITE): 1 or 1.54%; College of Allied Medical Professions (CAMP) 2 or 3.08%; Alternative Education (AE): 1 or 1.54%;and Graduate Studies (GS):31 or 47.69%.

Table 1. Respondents of the Study

Department	Population	Percentage
BED	14	21.54%
CASE	11	16.92%
CITHM	1	1.54%
CBEA	4	6.15%
CITE	1	1.54%
CAMP	2	3.08%
AE	1	1.54%
GS	31	47.69%
Total	**65**	**100%**

The table revealed that the most number of the teacher-respondents came from the Graduate Studies with thirty-one or 47.69% teacher-respondents. On the other hand the least number of teacher-respondents came from three (3) departments, namely: CITHM; CITE, and AE with one (1) teacher-respondent each or 1.54% of the total sixty-five (65) teacher-respondents.

The researchers believed that additional demographic information on the teacher-respondents may be relevant in the understanding of the findings of the study; thus, Tables 2, 3, and 4 on years of employment, teaching responsibilities, and academic preparations respectively were added.

Years of Employment

Table 2 showed the years of employment of the teacher-respondents. As can be gleaned from the same table, forty-two (42) or 64.62% of the teacher-respondents belonged to those employed by the higher educational institution from zero (0) to five (5) years. The years of employment of the teacher-respondents were as follows: ten (10) or 15.38% were employed for six (6) to ten (10) years; six (6) teacher respondents or 9.23% were employed for eleven (11) to fifteen (15) years and sixteen (16) to twenty (20) years. No one (0) teacher-respondent was employed for twenty-one (21) to twenty-five (25) years. Lastly, one (1) teacher-respondent or 1.54% was employed for twenty-six (26) or more years.

Table 2. Years of Employment

Years	Population	Percentage
0 - 5	42	64.62%
6 - 10	10	15.38%
11- 15	6	9.23%
16 - 20	6	9.23%
21 - 25	0	0.00%
26 years or more	1	1.54%
Total	**65**	**100%**

Teaching Responsibilities

Table 3 presented the teaching responsibilities of the sixty-five (65) teacher-respondents. Based on Table 3, most of the teacher respondents (23 or 35.38%) taught graduate students entirely. The least number of teacher-respondents (13 or 20.00%) taught some undergraduate and some graduate students. On the other hand, fourteen (14) or 21.54% and fifteen (15) or 23.08% of the teacher respondents taught entirely basic education and entirely undergraduate students respectively.

Table 3.Teaching Responsibilities

Teaching Resposibilities	Population	Percentage
Entirely basic education	14	21.54%
Entirely undergraduate	15	23.08%
Some undergraduate, some graduate	13	20.00%
Entirely graduate	23	35.38%
Total	**65**	**100%**

Academic Preparations

Table 4 revealed the academic preparations of the sixty-five (65) teacher-respondents of the study. The same table showed that most of the teacher-respondents or thirty-one (31 or 47.69%) attained a doctorate degree, either Doctor of Philosophy (PhD), Doctor of Education (EdD), or Medical Doctor (MD).

Table 4. Academic Preparations

Academic Preparations	Population	Percentage
PhD / EdD / MD	31	47.69%
MA / MS	22	33.85%
AB / BS	12	18.46%
Total	**65**	**100%**

There were twenty-two (22) or 33.85% of the teacher-respondents who attained a Master of Arts (MA) or a Master of Science (MS) degree of education. On the other hand, the least number of teacher-respondents or twelve (12 or 18.46%) graduated from an Bachelor of Arts (AB) or Bachelor of Science (BS) degree.

The academic preparations of the teacher-respondents which noted the attainment of a PhD or EdD or MD matched the information on the teaching responsibilities at the Graduate Studies.

Instruments of the Study

The study utilized two (2) standardized instruments: Bravo et al.'s Perceptions on Accreditation Process and Schwietz's Internationalization of the Academic Professions. These instruments measured the perceptions of the teaching personnel on the accreditation process and internationalization efforts apt for the current situation of a global pandemic.

The first instrument employed a five (5)-point Likert scale, ranging from strongly disagree (1) to strongly agree (5). Based on the results from the EFA, a 4-factor model was built and tested with IBM SPSS AMOS ver. 24. Factor A was on Institutional relevance of accreditation. It included loadings from scales assessing facets of positive effects of accreditation on the university. Factor B was on Objectivity of accreditation evaluation. It included loadings from items that assessed clarity, quality and completeness of functions and support from the national accreditation commission and peer reviewers. Factor C was on Internal Quality Unit relevance for accreditation.

It was associated with items that assessed value and functions of the internal quality unit, within the organization. Finally, Factor D was on Value of accreditation to educational system. It expanded the scope outside the university, towards the educational system as a whole, evaluating the value of accreditation for the system mentioned. The model had good to very good indices of fit, e.g., NFI = .947, PCLOSE = .684, RMR = .023, RMSEA = .045, SRMR = .036.

The second instrument on the internationalization of the professions was composed of the forty-nine (49) questions: nine (9) questions in international experiences; three (3) questions on foreign language ability; seven (7) questions on academic orientation; ten (10) questions on the assessment of campus climate; thirteen (13) questions on faculty involvement in internationalization; and fourteen (14) indicators on attitudes and beliefs about internationalization.

Data Gathering Procedure

The mode of data gathering was the survey questionnaire method. Each of the respondents was given a well-structured, well-instructed, and standardized set of questions to describe

quantitatively the perceptions on the accreditation process and the internationalization of the professions. Due to the global COVID-19 pandemic, the instruments were administered and collected virtually through online Google forms which included an introductory paragraph wherein the respondents were informed that the survey would be utilized for research purposes only and that their anonymity and privacy would be kept in strict confidentiality. Also, respondent were given the option to discontinue should they choose not to take part in the study.

Data Processing and Statistical Treatment

The data collected were tabulated and processed using Statistical Packages for Social Sciences (SPSS). The findings were presented using the necessary tables and figures. In order to analyze and interpret the data gathered, the following statistical measures were used:

- The perceptions on the accreditation process was quantified and described using the rating scale, range of scoring, and descriptors suggested in the Bravo et al.'s Perceptions on Accreditation Process instrument.

- The internationalization of the professions was quantified and described using the rating scale, range of scoring, and descriptors suggested in the Schwietz's Internationalization of the Academic Professions instrument. A 5-point Likert scale in which the respondents' responses for the given indicators may range from "Very significant" (5), "Significant" (4), "Moderately significant" (3), "Insignificant" (2) and "Very insignificant" (1). The scale is as follows:

Rating Scale	Range	Descriptive Evaluation
5	4.50-5.00	Very significant
4	3.50-4.49	Significant
3	2.50-3.49	Moderately significant
2	1.50-2.49	Insignificant
1	0.00-1.49	Very Insignificant

- A Pearson-r correlation was used to determine the relationship between the perceptions on the accreditation process and the internationalization of the professions.

Ethical Considerations

The researchers adhered to ethical considerations by protecting the individual personal information and communication to secure the data privacy of the respondents while ensuring free flow of information to promote innovation and growth. It ensures the security and protection of personal information. Thus, the personal details of respondents and research locale were kept in anonymity. Also, the researchers administered and collected the instruments virtually through Google Forms. Google Forms also provided a cover page which sought the permission of the respondents to consent to the administration of the questionnaire. This is considered the Informed Consent of the Respondents. Finally, the researchers submitted the study to the University's policies on ethics through the institution's Research and Ethics Committee, which ensured the gathering and handling of data with utmost security and confidentiality.

Results and Discussions

This section presents the perceptions on the accreditation process of the teacher-respondents, the internationalization of the professions, the relationship between the perceptions of the accreditation process and the internationalization of the professions, the role of accreditation on the internationalization of the professions, and the proposed activities on the internationalization of the professions.

Perceptions of the Accreditation Process

The perceptions of the teacher-respondents on the accreditation process were based on the following aspects: Institutional Relevance of Accreditation; Objectivity of Accreditation Evaluation; Internal Quality Unit Relevance for Accreditation; Value of Accreditation to Educational System; Continuous quality management; and Student Participation Value.

Institutional Relevance of Accreditation

Table 5 showed the perception of the teacher-respondents on the accreditation process based on the institutional relevance of accreditation. As can be gleaned from the same table, the teacher-respondents strongly agreed on the institutional relevance of accreditation as proven

by the grand mean of 4.61. Specifically, they strongly agreed on the indicators such as: ensuring the quality of the institution (4.60) and the promotion of quality of the institution (4.62). The relevance of accreditation as an answer for the pursuit of quality was corroborated by Flores & Center for American Progress (2019); Tapilatu et al. (2018); Cohen & Kisker (2010) as cited in Flood & Roberts (2017).

Table 5. Institutional Relevance of Accreditation

Indicators	Mean	Verbal Interpretation
The accreditation process fulfilled the function of publicly ensuring the quality of my institution.	4.60	Strongly Agree
The accreditation process fulfilled the function of promoting quality in my institution.	4.62	Strongly Agree
Grand Mean	4.61	Strongly Agree

Objectivity of Accreditation Evaluation

Table 6 presented the perceptions on accreditation process of the teacher-respondents based on the objectivity of accreditation evaluation. The same table revealed that they strongly agreed on the objectivity of the accreditation evaluation as proven by the grand mean of 4.51. Specifically, they strongly agreed on the realistic standards set by the accrediting bodies (4.52) and agreed on the valid and exhaustive recommendations of the evaluators (4.49). The submission of educational institutions to accrediting agencies such as the Philippine Association of Colleges and Universities Commission on Accreditation (PACUCOA) manifested the continuous patronage of academic institutions on the objectivity of accreditation evaluation. Noda (2021) emphasized the need for acccreditation to cultivate a 'culture of evidence' in universities to capture their initiatives and make such efforts empirically meaningful.

Table 6: Objectivity of Accreditation Evaluation

Indicators	Mean	Verbal Interpretation
The standards set by the accrediting bodies are realistic.	4.52	Strongly Agree
The evaluators' recommendations were valid and exhaustive.	4.49	Agree
Grand Mean	4.51	Strongly agree

Internal Quality Unit Relevance for Accreditation

Table 7 showed the perceptions of the teacher-respondents on the accreditation process based on the internal quality unit relevance for accreditation. As can be gleaned from the same table, the teacher-respondents strongly agreed on the institutional quality unit relevance of accreditation as proven by the grand mean of 4.58. Specifically, they strongly agreed (4.58) on the usefulness of the accreditation process to the faculty and staff of the institution.

Table 7: Internal Quality Unit Relevance for Accreditation

Indicators	Mean	Verbal Interpretation
The accreditation process was useful for the faculty and staff of my institution.	4.58	Strongly Agree
Grand Mean	4.58	Strongly Agree

Value of Accreditation to Educational System

Table 8: Value of accreditation to educational system

Indicators	Mean	Verbal Interpretation
The accreditation process helped clarify important strengths and concerns of the institution.	4.60	Strongly Agree
The accreditation process is one of the most important factors in ensuring educational improvement in the Philippines.	4.52	Strongly Agree
I would worry that the educational quality of higher education institutions could deteriorate if the accreditation process is ended.	4.20	Agree
Grand Mean	4.44	Agree

Continuous Quality Management

Table 8 showed the perceptions of the teacher-respondents on the accreditation process based on the value of accreditation process to the educational system. As can be gleaned from the same table, the teacher-respondents strongly agreed on the value of accreditation process to the educational system as proven by the grand mean of 4.44. Specifically, they strongly agreed on the following values of accreditation: clarification of the important strengths and concerns of the institution (4.60) and ensuring educational improvement in the Philippines

(4.52). They agreed that the lack of accreditation could deteriorate educational institutions (4.20). This finding was supported by Bloand (2001); Lubinescu et al. (2001); and Wheelan & Elgart (2015) as cited in Flood & Roberts (2017) who upheld that accreditation is a tool for promoting institutional improvement and excellence.

Table 9 presented the perceptions of the teacher-respondents on the accreditation process based on the continuous quality management. The same table showed their strong agreement to the continuous quality management as proven by the grand mean of 4.49. Specifically, they strongly agreed on the following indicators of the continuous quality management institutional momentum in addressing significant issues related to accreditation standards (4.60) and agreed on adequate training on how to prepare for accreditation visit (4.37). Barzansky et al. (2015) identified the factors that affected the implementation of continuous quality improvement and concluded that accreditation can enhance educational program quality and outcomes.

Table 9. Continuous Quality Management

Indicators	Mean	Verbal Interpretation
The accreditation process helped my institution gain momentum by addressing significant issues related to accreditation standards.	4.60	Strongly Agree
My institution received adequate training on how to prepare for an accreditation visit.	4.37	Agree
Grand Mean	4.48	Agree

Student Participation Value

Table 10 showed the perceptions of the teacher-respondents on the accreditation process based on the student participation. As can be gleaned from the same table, the teacher-respondents strongly agreed on the student participation value as proven by the grand mean of 4.58. Elassy (2015) revealed that students were not widely involved in the accreditation process and recommended to increase the student involvement in the process.

Table 10. Student Participation Value

Indicators	Mean	Verbal Interpretation
The accreditation process motivates my institution to focus more on assessing student learning.	4.58	Strongly Agree
Grand Mean	4.58	Strongly Agree

Table 11 revealed the perceptions of the institutional personnel on the accreditation process. The same table showed that the institutional personnel strongly agreed on all aspects of the

accreditation process as proven by the grand mean of 4.53. Specifically, the personnel strongly agreed on the following indicators: institutional relevance of accreditation (4.61), objectivity of accreditation evaluation (4.51), internal quality unit relevance for accreditation (4.58), value of accreditation to educational system (4.44), continuous quality management (4.48), and student participation value (4.58). The highest mean was on the institutional relevance of accreditation at 4.61. Alaskar et al. (2019) found the high perceptions of process and purpose of institutional accreditation as significant predictors of motivation and involvement among participants in the accreditation process. Interestingly, it was also observed that the perception of purpose was significantly higher in government than private institutions. However, the lowest mean was observed on the value of accreditation to the educational system at 4.44.

Table 11: Perceptions on the Accreditation of the Institutional Personnel

Indicators	Mean	Verbal Interpretation
Institutional Relevance of Accreditation	4.61	Strongly agree
Objectivity of Accreditation Evaluation	4.51	Strongly agree
Internal Quality Unit Relevance for Accreditation	4.58	Strongly Agree
Value of Accreditation to Educational System	4.44	Agree
Continuous quality management	4.48	Agree
Student Participation Value	4.58	Strongly Agree
Grand Mean	4.53	Strongly agree

Internationalization of the Professions

The internationalization of the professions was described based on the following dimensions: International Experiences; Foreign Language Ability; Academic Orientation; Assessment of Campus Climate; Faculty Involvement in Internationalization; and Attitudes and Beliefs About Internationalization.

International Experiences

On the internationalization of the professions, most of the institutional personnel never had international experiences. Particularly, the teacher–respondents never had international experiences in a country other than the Philippines on the following dimensions: classes before beginning college, 60 or 92.31%; academic experience as an undergraduate, 59 or 90.77%; academic experience as a graduate student, 49 or 75.38%; academic experience in teaching or conducting research as a faculty member, 47 or 72.31%; academic experience of

taking students to one or more foreign countries as a faculty member, 53 or 81.54%. The table revealed the one (1) month or less international experience of the teacher-respondents on the following: academic experience of teaching or conducting research (9 or 13.85%); academic experience as a graduate student (7 or 10.77%); taking students for an academic experience abroad (6 or 9.23%); and academic experience as an undergraduate student (1 or 1.54%). There were four (4) teacher-respondents or 6.15% who had more than a month but less than a year international experience on academic experience as a graduate student, academic experience teaching or conducting research, and taking students abroad as a faculty member. Also, three (3) or 4.62% of the teacher-respondents had more than a month but less than a year international experience in attending classes before beginning college and academic experience as an undergraduate student. Interestingly, five (5) teacher-respondents or 7.69% had more than one (1) year of an international experience on academic experience as graduate student and academic experience teaching or conducting research as a faculty member. Also, there were two (2) or 3.08% teacher-respondents with more than one (1) year of international experience on attending classes before beginning college, academic experience as an undergraduate student, and taking students abroad as a faculty member. The teacher-respondents with academic experiences in countries other than the Philippines had gone to the following regions: East Asia (6 or 7.69%); South and Central Asia (2 or 2.56%); South East Asia (20 or 25.64%); Eastern Europe (2 or 2.56%); Western Europe (2 or 2.56%); Central America (4 or 5.13%); South America (1 or 1.28%); North America (1 or 1.28%); Middle East (5 or 6.41%); and Australia/Oceania (5 or 6.41%). It was not applicable to 30 or 38.46% institutional personnel who never had an international experience. While forty-one (41 or 63.08%) of the institutional personnel had no academic experience in countries other than the Philippines, twenty (20 or 30.77%) had international experiences in one (1) to three (3) countries throughout their educational life. Two (2 or 3.08%) each teacher-respondents had international experience throughout their educational life in four (4) to six (6) countries and seven (7) to nine (9) countries. It is interesting to note that six (6) or 9.23% had lived outside of the Philippines before becoming a faculty member at the current private Catholic higher education institution for less than one (1) month, two or 33.33%); for six (6) to ten (10) years, two (2) or 33.33%; and for more than ten (10) years, two (2) or 33.33% while fifty-nine (59 or 90.77% had not lived outside of the country. Sotikova (2021) included the opportunity to travel to different countries during their studies and good relationship with foreign students as important factors in shaping international experiences in educational institutions.

Table 12. International Experiences

I have had the following experience in countries other than the Philippines for the length of time indicated for each.	Never	%	1 month or less	%	>1 mo & <1 yr	%	>= 1	%
Before beginning college, I attended classes in a country other than the Philippines.	60	92.31%	0	0.00%	3	4.62%	2	3.08%
As an undergraduate student, I had one or more academic experiences in a country (or countries) other than the Philippines.	59	90.77%	1	1.54%	3	4.62%	2	3.08%
As a graduate student, I had one or more academic experiences in a country (or countries) other than the Philippines.	49	75.38%	7	10.77%	4	6.15%	5	7.69%
As a faculty member, I had one or more academic experiences (teaching or conducting research) in a country (or countries) other than the Philippines.	47	72.31%	9	13.85%	4	6.15%	5	7.69%
As a faculty member, I have taken students to one or more foreign countries for an academic experience abroad.	53	81.54%	6	9.23%	4	6.15%	2	3.08%

If you have had academic experiences in countries other than the Philippines, which world regions have you gone to?	Africa	East Asia	South and Central Asia	South East Asia	Eastern Europe	Western Europe	Caribbean	Central America
	0	6	2	20	2	2	0	4
%	0.00%	7.69%	2.56%	25.64%	2.56%	2.56%	0.00%	5.13%

If you have had academic experiences in countries other than the Philippines throughout your educational life, please indicate the number of different countries in which you have had such experiences.	None	1-3	4-6	7-9	10&+
	41	20	2	2	0
%	63.08%	30.77%	3.08%	3.08%	0.00%

Have you ever lived outside of the Philippines before becoming a faculty member at your current institution? Do not include the time you may have spent abroad as a student.	Yes	No
	6	59
%	9.23%	90.77%

If yes, how long did you live outside of the Philippines?	<1	1-5	6-10	>10
	2	0	2	2
%	33.33%	0.00%	33.33%	33.33%

Foreign Language Ability

On the internationalization of the professions, the foreign language ability of the teacher-respondents may be described as follows: three (3) or 4.62% could not speak or read any other languages other than Filipino. Thirty-three (33) or 50.77% of the teacher-respondents could speak or read one (1) language other than Filipino.

Also, seventeen (17) or 26.15% could speak or read two (2) languages other than Filipino. Moreover, twelve (12) or 18.46% of the teacher-respondents could speak or read three (3) or more languages other than Filipino.

Furthermore, those who could speak or read a language other than Filipino had the ability in the other language/s to: understand only at a basic level of comprehension (54 or 87.10%); read some sections of a daily newspaper (52 or 83.87%); read a journal article (58 or 93.55%,) the highest foreign language ability; write an article or book for native speakers (47 or 75.81%); carry on an informal conversation about daily events with a native speaker (57 or 91.94%); and give a presentation on a topic to native speakers (49 or 79.03%).

Conversely, however, eight (8) or 12.90% could not understand the foreign language on a basic level of comprehension only. Ten (10) or 16.13% could not read some sections of a daily newspaper; four (4) or 6.45% could not read a journal article; fifteen (15) or 24.19% could not write an article or book for native speakers; five (5) or 8.06% could not carry an informal conversation about daily events with native speakers; and thirteen (13) or 20.97% could not give presentation on a topic to native speakers of a foreign language.

Besides Filipino, the fifty (50) or 80.65% of the teacher-respondents could speak or read English. Aside from English, three (3) or 4.84% could speak or read Spanish; one (1) or 1.61% could speak or read French; one (1) or 1.61% could speak or read other European languages; three (3) or 4.84% could speak or read Japanese; two (2) or 3.23% each could read or speak Chinese and other Asian languages.

Gardner (2018) revealed that students in internationalized institutions expected English not only a medium of instruction but also a lingua franca for social interaction with their peers and local counterparts.

Table 13. Foreign Language Ability

Besides Filipino, how many other languages can you speak or read?	None	1	2	3 or more						
	3	33	17	12						
%	4.62%	50.77%	26.15 %	18.46 %						
If you know a language other than Filipino, in that language are you able to:	Yes	%	No	%						
Understand that language at only a basic level of comprehension?	54	87.10%	8	12.90 %						
Read some sections of a daily newspaper?	52	83.87%	10	16.13 %						
Read a journal article in your field?	58	93.55%	4	6.45 %						
Write an article or book in your field for native speakers?	47	75.81%	15	24.19 %						
Carry on an informal conversation about daily events with a native speaker?	57	91.94%	5	8.06 %						
Give a presentation on a topic in your field to native speakers?	49	79.03%	13	20.97 %						
Besides Filipino, which language(s) can you speak or read:	English	Spanish	French	German	Other European Languages	Arabic	Japanese	Chinese	Other Asian Languages	African Languages
	50	3	1	0	1	0	3	2	2	0
%	80.65%	4.84%	1.61 %	0.00 %	1.61 %	0.00 %	4.84%	3.23%	3.23%	0.00%

Academic Orientation

Table 14 revealed the academic orientation of the teacher- respondents. As can be gleaned from the same table, they strongly agreed on all indicators of academic orientation on affiliation as proven by the Grand Mean of 4.86. They strongly agreed on all indicators of academic orientation on affiliation namely: importance of affiliation to academic discipline (4.88); importance of affiliation to the university (4.83), which was the lowest mean value; and importance of affiliation to the department (4.88).

Moreover, they agreed on the faculty preferences for teaching and research as proven by a

grand mean of 4.30. They agreed that faculty members were primarily teachers (4.35) and that faculty members were primarily researchers (3.92), the lowest mean value. Furthermore, they strongly agreed that faculty members were both teachers and researchers (4.63).

As to the preferences of the respondents, they were as follows: thirteen (13) or 20.00% was primarily in teaching; thirty-seven (37) or 56.92% was in teaching and in research but leaning towards teaching; none (0) or 0.00% was primarily in research; and fifteen (15) or 23.08% was in teaching and in research but leaning toward research.

Table 14. Academic Orientation

Indicators	Mean	Verbal Interpretation
1) My affiliation to my academic discipline is very important to me.	4.88	Strongly Agree
2) My affiliation to my university is very important to me.	4.83	Strongly Agree
3) My affiliation to my department is very important to me.	4.88	Strongly Agree
Grand Mean	4.86	Strongly Agree
We would like to learn more about your perceptions regarding faculty preferences for teaching and research. Please select an answer that best describes your perception.		
4) Faculty members view themselves primarily as teachers.	4.35	Agree
5) Faculty members view themselves as both teachers and researchers.	4.63	Strongly Agree
6) Faculty members view themselves primarily as researchers.	3.92	Agree
Grand Mean	4.30	Agree

Regarding your own preferences, do your interests lie primarily in teaching or in research?	Primarily in teaching	In both, but leaning toward teaching	Primarily in research	In both, but leaning toward research
	13	37	0	15
%	20.00%	56.92%	0.00%	23.08%

Assessment of Campus Climate

Table 15 showed the assessment of the campus climate. The same table revealed the agreement of the respondents to indicators of the assessment of the campus climate as proven by the grand mean of 4.09. Specifically, the respondents agreed on all indicators of the assessment of campus climate including an expressed commitment to internationalization by senior leaders (4.28); active involvement in internationalization by faculty and staff (4.25); faculty encouragement to include international perspectives and content in their courses (4.37); availability of funds to support internationalization and the development of faculty members' international skills and knowledge (3.85); participation in international activities by faculty members (4.25); international expertise as part of recruitment and selection

procedures of new faculty (3.97); recognition and favorable review of faculty involvement in internationalization activities by campus-wide promotions committee (4.09); recognition and favorable review of faculty involvement in internationalization activities by campus-wide tenure committee (4.11); opportunities for international scholars to teach, conduct research or develop collaborations with U.S.-based faculty(3.77); and commitment to international education (4.00).

Table 15. Assessment of Campus Climate

Indicators	Mean	Verbal Interpretation
1) There is an expressed commitment to internationalization by senior leaders.	4.28	Agree
2) There is active involvement in internationalization by faculty and staff.	4.25	Agree
3) Faculty are actively encouraged to include international perspectives and content in their courses.	4.37	Agree
4) Funds are available to support internationalization and the development of faculty members' international skills and knowledge.	3.85	Agree
5) Participation in international activities by faculty members is viewed favorably by my department.	4.25	Agree
6) International expertise is part of recruitment and selection procedures of new faculty.	3.97	Agree
7) The campus wide promotions committee recognizes and favorably reviews faculty involvement in internationalization activities.	4.09	Agree
8) The campus wide tenure committee recognizes and favorably reviews faculty involvement in internationalization activities.	4.11	Agree
9) There are opportunities for international scholars to teach, conduct research or develop collaborations with U.S.-based faculty.	3.77	Agree
10) Commitment to international education is primarily symbolic.	4.00	Agree
Grand Mean	4.09	Agree

Faculty Involvement in Internationalization

Moreover, the indicator on the assessment of campus climate with the highest mean value was on faculty encouragement to include international perspectives and content in their courses (4.37) while the lowest mean value was on opportunities for international scholars to teach, conduct research or develop collaborations with U.S.-based faculty (3.77).

Valadez (2021) revealed the sustained role of campus environment, as positive perceptions of campus climate are associated with positive engagement and negative perceptions with negative engagement. Also, Jean-Francois (2019) revealed that self-determination has influenced the intercultural strategies of integration used by international students on a US university campus.

Table 16 described the faculty involvement in internationalization. As can be gleaned from the same table, the respondents affirmed their involvement in international activities related to teaching, research, and scholarship in the past three (3) years as follows: teaching a course that included a significant component about other countries, cultures, or global issues (43 or 66.15%); revision of an existing course or proposed a new course that included a significant component about other countries, cultures, or global issues (25 or 38.46%); revision of an existing program of study or proposed a new program of study that included a significant component about other countries, cultures, or global issues (20 or 30.77%); teaching a foreign college or university located outside of the Philippines (7 or 10.77%); presentation of research or creative works at seminars, conferences or exhibitions held outside the Philippines (20 or 30.77%); conduct of research outside the Philippines (10 or 15.38%); submission to or publication in a foreign journal or press, excluding reprints (17 or 26.15%); work with local organization or schools on projects of an international nature (20 or 30.77%); travel outside the Philippines to participate in a professional service or development project at a foreign college of university (11 or 16.92%); involvement in the development or delivery of education programs to other countries through any of a variety of delivery modes (face to face, distance, e-learning) or through different administrative arrangements (franchises, twinning, branch campuses, etc.) (13 or 20.00%); planning campus events of an international nature (10 or 15.38%); involvement with campus-based student clubs and associations of an international nature (10 or 15.38%); and involvement in a grant-funded project of an international nature (5 or 7.69%).

Inversely however, the respondents responded ‘no’ to their involvement in international activities related to teaching, research, and scholarship in the past three (3) years. These activities were as follows: teaching a course that included a significant component about other countries, cultures, or global issues (22 or 33.85%); revision of an existing course or proposed a new course that included a significant component about other countries, cultures, or global issues (40 or 61.54%); revision of an existing program of study or proposed a new program of study that included a significant component about other countries, cultures, or global issues (45 or 69.23%); teaching a foreign college or university located outside of the Philippines (58 or 89.23%); presentation of research or creative works at seminars, conferences or exhibitions held outside the Philippines (45 or 69.23%); conduct of research outside the Philippines (55 or 84.62%); submission to or publication in a foreign journal or press, excluding reprints (48 or 73.85%); work with local organization or schools on projects

of an international nature (45 or 69.23%); travel outside the Philippines to participate in a professional service or development project at a foreign college of university (54 or 83.08%); involvement in the development or delivery of education programs to other countries through any of a variety of delivery modes (face to face, distance, e-learning) or through different administrative arrangements (franchises, twinning, branch campuses, etc.) (52 or 80.00%); planning campus events of an international nature (55 or 84.62%); involvement with campus-based student clubs and associations of an international nature (55 or 84.62%); and involvement in a grant-funded project of an international nature (60 or 92.31%).

Interestingly, the respondents only showed faculty involvement in internationalization in terms of teaching a course that included a significant component about other countries, cultures, or global issues. Nyangau (2018) showed that intrinsic rewards, rather than extrinsic rewards, have a stronger influence on faculty involvement in internationalization. Inversely though, time-commitment, lack of rewards, and insufficient funding are some of the barriers to increased faculty participation in internationalization. Moreover, Nyangau (2020) proved that strong efficacy beliefs and positive perceptions about organizational context are strong influences on faculty behavior relative to international engagement.

Table 16. Faculty Involvement in Internationalization

In this section, we would like to learn more about your involvement in international activities related to your teaching, research, and scholarship.	Yes	%	No	%
In the past three years, have you taught a course that includes a significant component about other countries, cultures, or global issues?	43	66.15%	22	33.85%
In the past three years, have you revised an existing course or proposed a new course that includes a significant component about other countries, cultures, or global issues?	25	38.46%	40	61.54%
In the past three years, have you revised an existing program of study or proposed a new program of study that includes a significant component about other countries, cultures, or global issues?	20	30.77%	45	69.23%
In the past three years, have you taught a foreign college or university located outside of the Philippines?	7	10.77%	58	89.23%
In the past three years, have you presented your research or creative works at seminars, conferences or exhibitions held outside the Philippines?	20	30.77%	45	69.23%
In the past three years, have you conducted research outside the Philippines?	10	15.38%	55	84.62%
In the past three years, have you submitted to or published in a foreign journal or press, excluding reprints?	17	26.15%	48	73.85%
In the past three years, have you worked with local organization or schools on projects of an international nature?	20	30.77%	45	69.23%
In the past three years, have you traveled outside the Philippines to participate in a professional service or development project at a foreign college of university?	11	16.92%	54	83.08%
In the past three years, have you been involved in the development or delivery of	13	20.00%	52	80.00%

education programs to other countries through any of a variety of delivery modes (face to face, distance, e-learning) or through different administrative arrangements (franchises, twinning, branch campuses, etc.)?				
In the past three years, have you planned campus events of an international nature?	10	15.38%	55	84.62%
In the past three years, have you been involved with campus-based student clubs and associations of an international nature?	10	15.38%	55	84.62%
In the past three years, have you been involved in a grant-funded project of an international nature?	5	7.69%	60	92.31%

Attitudes and Beliefs about Internationalization

Table 17 showed the attitudes and beliefs about internationalization. As can be gleaned from the same table, the teacher-respondents agreed on the attitudes and beliefs about internationalization as proven by the grand mean of 4.38. Specifically, the respondents strongly agreed on six (6) out of fourteen (14 indicators on the attitudes and beliefs about internationalization as follows: importance of the knowledge on international issues (4.69); importance of the knowledge on international issues to the younger generations (4.65); importance of connections with scholars in other countries to professional work (4.65); reading of books and journals published abroad in order to keep up with developments in the discipline (4.66); importance of an international perspective in the discipline and valued part in teaching and research (4.63); and enriching the learning experience of students on the presence of international students (4.51).

Moreover, the respondents agreed on eight (8) out of fourteen (14) indicators on the attitudes and beliefs about internationalization. They agreed on the following indicators: development of an international perspective in teaching (4.37); development of an international perspective in research (4.25); the more time spent on teaching students about other countries, cultures, or global issues, the less available time for teaching the basics (4.05); international education as a useful but not a necessary component of undergraduate education (3.85); requirement of all students in colleges and universities to take courses covering international topics (4.31); graduation with an awareness about other countries, cultures, or global issues of most undergraduate students (4.18); the responsibility of ALL faculty to provide undergraduate students with an awareness of other countries, cultures, or global issues (4.40); and international focus on the curriculum at the institution (4.15).

Furthermore, the indicator on attitudes and beliefs about internationalization with the highest

mean value was on the importance of the knowledge on international issues (4.69), while the lowest value was on international education as a useful but not a necessary component of undergraduate education (3.85). Bernardo (2019) found that polyculturalism was associated with more positive perceptions of the effects of globalization on the economy and culture of Macau, and there was a positive trend in the perceived effect of migration on Macau society.

Table 17. Attitudes and Beliefs about Internationalization

Indicators	Mean	Verbal Interpretation
1) Knowledge of international issues is important to me.	4.69	Strongly Agree
2) Knowledge of international issues is important for younger generations.	4.65	Strongly Agree
3) Connections with scholars in other countries are very important to my professional work.	4.65	Strongly Agree
4) In order to keep up with developments in my discipline, a scholar, must read books and journals published abroad.	4.66	Strongly Agree
5) An international perspective in my discipline is an important and valued part of my teaching and research.	4.63	Strongly Agree
6) I am developing more of an international perspective in my teaching.	4.37	Agree
7) I am developing more of an international perspective in my research.	4.25	Agree
8) The more time that is spent teaching students about other countries, cultures, or global issues, the less time is available for teaching the basics.	4.05	Agree
9) International education is a useful but not a necessary component of undergraduate education.	3.85	Agree
10) Colleges and universities should require all students to take courses covering international topics.	4.31	Agree
11) The presence of international students (students from other countries) on U.S. campuses enriches the learning experience for American students.	4.51	Strongly Agree
12) Most undergraduate students graduate with an awareness about other countries, cultures, or global issues.	4.18	Agree
13) It is the responsibility of ALL faculty to provide undergraduate students with an awareness of other countries, cultures, or global issues.	4.40	Agree
14) The curriculum at my institution should be more international in focus.	4.15	Agree
Grand Mean	4.38	Agree

The Relationship between the Perceptions of the Accreditation Process and the Internationalization of the Professions

Table 18 revealed the significant relationship between the perceptions of the accreditation process and the internationalization of the professions. The computed r of 0.5725 means that there is a moderate positive relationship between the perception on accreditation and

internationalization of the academic profession. Since the correlation is positive; therefore, there is a direct relationship between the independent variable and the dependent variable. We can therefore claim that the higher the perception of the staff on accreditation, the bigger the chance for them to internationalize their academic profession and vice versa. Also, this is a moderate positive correlation, which means there is a tendency for high X variable scores go with high Y variable scores and vice versa. Since the p-value or sig-value 0.00001 is less than the level of significance 0.05, the null hypothesis (Ho) is rejected and therefore the test is significant.

Based on this result, we can claim that a significant relationship exist between the perceptions on the accreditation process and internationalization of the academic professions. Sun et al. (2018) recognized the intensification of internationalization through accreditation. Similarly, Landoni (2005) observed that accreditation opens an opportunity for cooperation between the State and the universities due to the international challenge. Noori & Anderson (2013) focused on accreditation and accreditation practices in the context of globalization.

Table 18. Pearson r Correlation on the Relationship between the Perceptions of the Accreditation Process and the Internationalization of the Professions

Correlations		Perception on Accreditation	Internationalization of the Academic Profession
Perception on Accreditation	Pearson Correlation	1	.572**
	Sig. (2-tailed)		0.00001
	N	65	65
Internationalization of the Academic Profession	Pearson Correlation	.572**	1
	Sig. (2-tailed)	0.00001	
	N	65	65

*** Correlation is significant at the 0.05 level (2-tailed).*

The Role of the Accreditation Process on the Internationalization of the Professions

Table 19 showed the role of the accreditation process on the internationalization of the professions. The same table revealed that, overall, the respondents strongly agreed that the internationalization of the professions is significant to the institution (4.62); that the

accreditation process is significant to the institution (4.63, the highest mean value; and that accreditation plays a significant role towards the internationalization of the professions (4.57), the lowest mean value. Eaton (2002) discussed how accreditation protects the quality in the emerging internationalization of higher education. Furthermore, Kumar et al. (2020) proved that accreditation was a powerful tool of quality assurance in the context of globalization.

Table 19. The Role of the Accreditation Process on the Internationalization of the Professions

	Strongly Agree 5	Agree 4	Neither Agree Nor Disagree 3	Disagree 2	Strongly Disagree 1	Don't know 0	Mean	Description
Overall, I believe that the Internationalization of the profession is significant to the institution.	44	20	0	0	0	1	4.62	Strongly Agree
Overall, I believe that the accreditation process is significant to the institution.	46	17	1	0	0	1	4.63	Strongly Agree
Overall, I believe that the accreditation process plays a significant role towards the internationalization of the professions.	42	21	1	0	0	1	4.57	Strongly Agree

Activities on the Internationalization of Professions proposed as Accreditation Standards based on the Findings of the Study

The following activities on the internationalization of the professions are proposed as accreditation standards based on the findings of the study:

- Acquisition of international experience through teaching or research by faculty members;
- International linkages and networks of the higher educational institutions (HEIs) which encourage faculty collaboration and partnership with a foreign institution;
- Recognition of faculty involvement in internationalization activities in teaching and research;
- Inclusion of topics on countries, cultures, and global issues as components of a course; and
- Connections with scholars in other countries.

Conclusions

Based on the findings of the study, the researchers present the following conclusions as follows:

- That the institutional personnel perceived the accreditation process as relevant factor in continuous management quality and ensuring excellence of the organization;
- That the teachers were aware on the international issues and global concerns in teaching; although, they had less international experience;
- That significant relationship exists between the perceptions on the accreditation process and the internationalization of the professions;
- That the accreditation process plays a significant role in the internationalization of the professions; and
- That there are proposed on the internationalization of the professions that may be used as accreditation standards based on the findings of the study.

Recommendations

Based on the findings and conclusions of the study, the following recommendations were hereby proposed:

- The higher educational institutions (HEIs) and other organizations should continuously submit their organization to accreditation by reputable accrediting bodies and agencies to identify the organizational strengths and weaknesses or areas of

improvement that may be utilized in enhancing the quality of the delivery of service to its stakeholders.

• The teachers in the higher educational institutions (HEIs) should network and collaborate with foreign colleges and universities to experience internationalization in teaching and research.

• Accreditation should include the internationalization of the professions as one of the areas of the accreditation process.

• The internationalization of the professions among academic institutions should be focused for enhancement by the accreditation process.

• Accrediting agencies and bodies should consider the proposed activities on the internationalization of the professions as accreditation standards.

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Chapter 4 - The Importance of Instructional Technologies and Material Design in Turkish-Literature Teaching

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Chapter Highlights

- A nation's cultural ideals are reflected through a variety of works of literature.
- In order to perceive, embrace, and spread the values that our society has developed through the years, it is essential to teach literature.
- In today's education approach, where it is necessary to appeal to many senses with a constructivist learning approach, it is a necessity to abandon the traditional education approach, to use, develop and prefer technological tools and equipment in language-literature education and training.
- It is part of the modern educational approach. For this reason, the basic skills of "critical thinking, creative thinking, communication, research-inquiry, problem-solving skills, using information technologies, entrepreneurship, using Turkish correctly, effectively and beautifully" were determined in the Ministry of National Education Turkish Teaching Programme (MEB, 2019).
- In the Turkish Language and Literature Curriculum (MEB, 2018) of the Ministry of National Education" "information literacy, critical thinking, visual literacy, communication and cooperation, and media literacy" competencies.

Introduction

Humans acquire the capacity to communicate with their surroundings and share their feelings, thoughts, and beliefs with others from the time of birth as part of their biological and mental development. It takes place in language. A means of communication is language. Language is the means through which a person with a social element may interact with others and express himself. Many of our connections with other people are mediated by language, which also influences our social interactions and serves as a tool in all facets of our life. Everywhere we go, including work, school, markets, and streets, it is all around us. The language of a nation is shaped and developed by the reflection of ideas, cultures, conventions, traditions, and life experiences from the past to the present. People and language are inextricably linked because language produces a complicated structure, and every person is a complex world just waiting to be explored (Bulut et al., 2012:130). One of the most fundamental forms of interhuman communication, language is a holdover from earlier civilizations. Language makes sure that people point each other in the right direction from the past to the present and the future. The common language indicates a shared fate. It is well-established that individuals who share a language have similar backgrounds, cultures, customs, and values (Özkan, 2003). A language with these characteristics not only conveys a culture but also a wealth of ideas, interpretations, and national independence. a country that cannot defend its language from foreign language influence; It is not only that society's terrifying nightmare to come across a generation detached from its past and alien to its culture and values, but it is also universally acknowledged that being human is not the only thing that sustains societies. Future generations also receive spiritual qualities through language, in addition to technological and civil advancements (Sezer, 2018:74). Turkish as a mother tongue provides excellent semantic richness in this context, allowing for the complete and efficient expression of feelings, thoughts, and dreams. A language must be processed for centuries and systematized with a unity of norms for its historical richness, scientific language, and literary language to acquire perfection in this sense. Turkish is also a “poetry-like” language with traits like having many vowels, adhering to a vowel rule, being pleasant to the ear with consonant affinity, itching the ear, building blocks, and grouping of related words. Making emphasis and intonation within a rule are aspects of a layout. Turkish has developed flawless reasoning over the years, as well as perfect operating order, ideal drought, perfect melody, and beauty that is pleasing to the eye and spirit. One of the oldest and most complex languages in the world is this cultural tongue, Turkish. One of the oldest nations in

the world is the Turks. Turkish is one of the oldest and most culturally diverse languages in the world (İşcan, 2007). With its thousands of years of history, Turkish is one of the oldest and richest languages in the world. However, one could assert that there are issues with education (Ağar, 2006:1). The following is how Kavcar explains the connection between language, literature, and education: Language serves as a mirror through which societies' ways of life, worldviews, and cultures can be seen. As a result, language is likewise impacted by changes in society. Language shifts have a social impact as well. The evolution of language instruction is also influenced by societal trends and occurrences. Education also has a role in the improvement of these conditions. In this sense, education, language, and literature are all interconnected. Education and literature both aim to benefit society and the individual (Kavcar, 1974: 9). Literature is the branch of art that uses words and letters to best capture human and social existence (Baraz, 1985: 2). Literature; It is a branch of fine arts. In a broad sense, all kinds of written works; In a narrow sense, only works written for artistic purposes enter the literary circle. Like poetry, verse and prose all works of art, novels, stories, plays, oratory that excite people's aesthetic sense; to the science that studies these works; The book that deals with this science as a subject is called literature (Karaalioğlu, 1980: 9). Regarding the origin of literature, the word literature comes from the Arabic word “edeb” and is connected to a more distant past, specifically the Arabic “edb” meaning “invitation to dinner”. The word literature has been used by Arabs for centuries in the sense of “good morals, linguistics, non-religious sciences and sciences arising from this tribe” (Bilgegil, 1989). A nation's cultural ideals are reflected through a variety of works of literature. The adoption and dissemination of these principles require the teaching of literature. Because what is depicted in literature is life and human. Literature assists the reader in understanding his true nature, which is principally that of a human being with all of his emotional facets. Literature teaches us to respect both our own and other people's unique personalities by helping us know and comprehend others as we know ourselves. It finds the most prevalent points of agreement between conflicts between people, people's environments, and society (Baraz, 1985: 2). The need for literary education cannot be disputed in order to purify our emotions, enliven our thoughts, and progress into the future, even though the artistic aspects of literature based on creative power, unique talent, and inspiration cannot be conveyed and taught through education (Mutluay, 1972: 354). A nation's cultural ideals are reflected through a variety of works of literature. In order to perceive, embrace, and spread the values that our society has developed through the years, it is essential to teach literature. However, the claimed goals of fostering thought and sensitivity education, increasing mother tongue

awareness, and accepting our cultural values are not met by teaching traditional Turkish literature in high schools (Baraz, 1985: 14). According to Mutluay, teaching Turkish Language and Literature in our schools cannot reach its goal; The student cannot be brought to the position of 'thinking right, understanding right, telling the truth what he knows' in the middle of the contrasts between the old language and the new, the old spelling and the present, the old literary taste and the (Mutluay, 1972, p.356).The results of Kantemir's (1976) study on the “Effectiveness of Teaching Turkish Language and Literary in High Schools” point to the need for the regeneration of literature instruction in our nation with a useful perspective and attitude (Kantemir, 1976, p.VII).

In today's education approach, where it is necessary to appeal to many senses with a constructivist learning approach, it is a necessity to abandon the traditional education approach, to use, develop and prefer technological tools and equipment in language-literature education and training. It is part of the modern educational approach. For this reason, the basic skills of “critical thinking, creative thinking, communication, research-inquiry, problem-solving skills, using information technologies, entrepreneurship, using Turkish correctly, effectively and beautifully” were determined in the Ministry of National Education Turkish Teaching Programme (MEB, 2019). In the Turkish Language and Literature Curriculum (MEB, 2018) of the Ministry of National Education” “information literacy, critical thinking, visual literacy, communication and cooperation, and media literacy” competencies.

Goals of Turkish-Literature Teaching

Within the fundamental parameters established by the citizenship state, the official language designated by the constitution and legislation shall be accepted and spoken. Turkish is the official language of the Republic of Turkey. In matters such as developing healthy communication, offering equal service, and guaranteeing unity and solidarity, it is crucial to use the official language as a foundation. The best schooling language instruction is required in this circumstance. Every person who is a citizen of a nation ought to be familiar with the official language chosen by the government because it is anticipated that he will desire to benefit from the educational opportunities. It is necessary to focus on a rigorous approach in the teaching of Turkish, which is the official language in Turkey. Teaching language skills is crucial at every stage of a person's life since people who are citizens will use the language in

any situation they come across (Karakuş, 2012: 5). Effective Turkish instruction, particularly mother language education, which forms the foundation of both formal and informal education in Turkey, acts as a tool for the development of national culture, national consciousness, and national identity in this setting. The Ministry of National Education's Turkish curricula aims to help Turkish students learn, adapt, and develop the Turkish language and culture, strengthen their national sensibilities in accordance with Atatürk's principles and reforms, and adapt to effective social relationships by adapting to their home country. Speaking a language accurately and fluently requires direct instruction rather than intrinsic aptitude (Baştuğ & Demirgüneş, 2016:17–18). Although there are six items in the 1968 Turkish curriculum, eight items in the 1982 Turkish curriculum, and 13 items in the 2005 Turkish curriculum, they should not be evaluated separately. In this context, the purpose of my Turkish education is to comply with the general purpose and basic principles of National Education. “It is to educate, help and guide them in terms of developing their understanding power, gaining expression skills and habits, listening and reading habits and pleasure, enriching their vocabulary, grasping basic grammar rules, awakening love, and awareness ” (Kavcar et al., 2016: 12).

The Ministry of National Education's 2019 Turkish Curriculum seeks to give pupils linguistic proficiency and lifelong learning capabilities in the areas of speaking, listening, watching, reading, and writing. These abilities provide them the ability to effectively communicate both privately and publicly. It is designed with integrity and incorporates information, abilities, and values so that students can read and write in Turkish voluntarily and successfully complete the Turkish Lesson Curriculum. It acknowledges that learning, personal and social growth, and developing professional abilities in all other fields require the development of language skills and competencies. Thematically prepared curricula frame reading and writing instruction such that students can derive meaning from reading in-text, extra-textually, and intertextually. From first grade through eighth grade, the structure and hierarchy of the acquisitions are set up in a way that will support students' development of both their foundational language skills and their advanced cognitive abilities. The acquisitions linked to grammar and spelling rules were constructed progressively and with increasing intensity in consideration of the pupils' developmental characteristics. With the Turkish Course Curriculum prepared by the General Purpose and Basic Principles of Turkish National Education expressed in the Basic Law of National Education No. 1739, students are better able to use Turkish consciously, correctly, and carefully by the rules of speaking and writing,

reading, listening/watching, and To help them develop their inner worlds of emotions, ideas, and dreams; to fall in love with and develop a habit of reading and writing; to verbally express their emotions, ideas, opinions, or theses clearly and effectively; to advance their research and discovery abilities; to interpret and construct information in their minds, and to access information. The goal is to employ written and visual materials and multimedia tools to hone organizing, questioning, using, generating, critically evaluating, and questioning abilities. Additionally, it aims to develop their ideas, help them recognize and embrace aesthetic and artistic qualities by helping them comprehend what they read and emphasizing national, spiritual, moral, historical, cultural, and social values as well as national sentiments (MEB, 2019).

Each nation has made a unique contribution to world knowledge, and the literature reflects these differences. It is crucial to comprehend how and why a country communicates its culture to its own people through its own literature since doing so is a necessary precondition for learning that language. Every country teaches literature in a different way. In addition to the educational philosophy and approach used in the teaching of literature, it is important to consider ideological divergences, acceptances, cultures, and beliefs. Literature courses are viewed as reading, analysis, and critical thinking courses rather than culture courses in many European nations (Çelik, 2018: 249). The 2018 Turkish Language and Literature Curriculum, currently in use in Turkey, has the following specific goals: To understand the nature and purpose of literature, as well as its significance for both individuals and society, to become familiar with Turkish literary nuances through literary texts, and to comprehend how Turkish literature has changed and developed over time about national, spiritual, moral, cultural, and universal values. Additionally, applying methods, speaking, reading, and writing in Turkish is effective. to build reading comprehension and critical reading abilities through texts, creating reading habits, answering questions, producing solution recommendations, and communicating their results. to be good communicators by using them effectively and responsibly (MEB, 2018). This is why, in accordance with the established concept of culture, the Turkish Language and Literature Curriculum carries the instructional role of culture in all of its aspects. It may be claimed that the 2018 Turkish Language and Literature Curriculum serves a purpose in terms of how culture is defined and constructed in accordance with particular values and ideas. The program aspires to educate people who are dedicated to cultural values, conscious of their culture, and active participants in cultural life across the board. It is intended to create a personality that has a social infrastructure, can participate in

social and cultural activities, and can use information age technology for cultural, social, and/or professional goals (Çevirme, 2018: 47).

In summary, the aims of teaching Turkish and literature are; it is to raise people who feel that reading is a basic requirement of life, who have developed sensitivity and thinking skills, and who have finished the process of individualization. It is to raise people who understand what they read, listen, and fully and accurately describe themselves beautifully and effectively (Aslan, 2017:3).

The Importance of Instructional Technologies

In every element of our life, the necessity of technology, which is essential to humans, has surpassed that of food and drink. Talking about structuring, development, and service in any field nowadays without mentioning technology is all but impossible. Technological advancements and their societal effects are a byproduct of scientific advancement. Technology is a tool that helps individuals who assume the position of educators to swiftly reach the target audience with training materials that are pertinent, systematic, and appropriate for the target audience and assist them in more effective learning of the necessary skills. We can argue that instructional technology is focused on applying scientific ideas to tackle issues that arise in the classroom. The principles of both material development and instructional technology are interconnected. Instructional technology is utilized to create accurate, updated, and effective course materials (Kaya, 2006: 25). Education is one of the areas where technology is used in the 21st century, where the shaping of human existence by technology is quickly growing. Therefore, changes in learning theories demonstrate the need for technology in education (Yaman, 2005). The countries that produce the technologies have become the shining lights of the globalizing world thanks to the dizzying advancements in information and communication technology in the second half of the 20th century. It is well recognized that we have not yet advanced to the level the country desires, despite all the excellent improvements in technology and knowledge output. The development of future generations into technology-producing, creative, and entrepreneurial people should be seen in this context as a promising development. This transformation will be facilitated by teachers who are knowledgeable about and use instructional technologies (Karataş&Yapıcı, 2006: 323). Given that “teaching” is a sub-concept of “education”, it is also possible to use the term “teaching” to refer to the way a certain educational discipline is organized, taking into

consideration its special characteristics. In order to generate unique learning arrangements of linked disciplines, this word refers to the systematic arrangement of design, implementation, assessment, and development actions based on learning-teaching processes in line with intentional and controlled particular goals (Alkan, 1998:16). In order to improve teaching and learning environments, educational technology has been used more frequently recently in both developed and developing nations. To carry out their vocation effectively and efficiently, teachers must possess a specific set of general knowledge, skills, and attitudes (Cabı & Ergün, 2016, Cano, 2022; Mutiara & Emilia, 2022; Mutlu & Akgun, 2019; Skoumpourdi & Matha, 2021). Indeed, the Ministry of National Education listed the following as "teaching profession general competencies" in (MEB, 2006):

Personal and Professional Values – Professional Development

A3.8. Knows the legal and moral responsibilities related to information and communication technologies and brings them to the students.

A5.12.Technology literate (has knowledge and skills related to technology-related concepts and practices).

A5.13.Follows the developments in information and communication technologies.

A6.2.Uses information and communication technologies to support professional development and increase productivity.

A6.9. It uses information and communication technologies (online magazines, packaged software, e-mail, etc.) to share information.

Getting to Know the Student

B2.3.Prepares suitable learning environments for students with different experiences, characteristics, and abilities by using information and communication technologies.

Teaching and Learning Process

C1.9. The lesson plan includes how to use information and communication technologies.

C2.3. Uses computer and other technological tools in material preparation.

C2.9. Accesses teaching-learning resources (databases, online resources, etc.) in technological environments and evaluates them in terms of accuracy and relevance.

C3.8.Models and teaches effective use of technology resources.

C5.8.Uses technologies that support student-centered strategies, taking into account the different needs of students.

Learning, Development Monitoring and Evaluation

D3.2.Analyzes data using information and communication technologies.

D3.8. Shares the evaluation results with parents, school management, and other educators using information and communication technologies". Some technology-focused frameworks have been established within the context of the general skills of the teaching profession. In this context, it can be seen that the "vocational education competencies" published in (MEB, 2017) by the Ministry of National Education contain a framework of the competencies in the subject of "material and technology". Learning outcomes were chosen as a proficiency indicator for "preparing appropriate teaching materials." The significance of educational resources has become apparent. By defining the "application of appropriate tools and materials in the learning-teaching process", a specific framework for "technology and teaching material" was created.

Today's learning and teaching paradigms have evolved, instructors' roles have altered, and strategies that are appropriate for traditional education have been adopted. For this reason, the teacher-centered teaching approach, which in the modern education approach has been replaced by the student-centered teaching approach, has been replaced by an understanding that is oriented on raising pupils with uniform student quality. The emphasis in this situation is on giving the student the required credentials. Teaching at this point is an interactive process in which the teacher, a tool, or a tool that serves as a teaching aid directs student learning. In this technique, the tutorial or teaching materials are "taught" and the learner experiences "learning". In the teaching process, there is an interaction between the student (learner) and the teacher (or the teaching material). Among these are computers, computer networks like the internet, "hypertext" tools, slide and movie projectors, instructional television, satellite broadcasts, individual teaching materials like programmed teaching materials, modular learning materials, textbooks, resources, and supplemental materials. These items are all products of the educational technology field that help pupils learn (Alpar et al., 2007: 20-21). Utilizing technological advancements in educational activities has moved from being a need to being a key component of raising generations who will ensure our future. Because of this, just like in every other aspect of everyday life, some tools help make the learning and teaching process in schools productive, efficient, and a lot simpler. Another definition of instructional technology is a process that ensures the choice, arrangement, and preparation of the right equipment as well as the construction and regulation of the

environments required for the fulfillment of learning. It also directs educators in problem-solving (Uyangör & Ece, 2010).

The Importance of Instructional Technologies in Turkish-Literature Teaching

Technology use is now required rather than voluntary in the information age. Teachers educate their pupils to help them become ready for a life in the information society as societal expectations for people change. As a result, technological compliance is a crucial concern. The "Instructional Technologies and Material Development" course was added to all programs in 1998 to ensure that teachers in teacher training faculties had the necessary technology skills and that the new educational system was technologically based (Gündüz & Odabaş, 2004: 43). Since 1998-1999, teacher training programs have offered the three-credit course Instructional Technologies and Material Design (Development) as a teaching formation course (YÖK, 2007; Seferoğlu, 2006). According to Seferoğlu (2006), the course's name was modified from instructional technologies and material development to instructional technologies and material design. One of the required courses for the teaching profession is "Instructional Technologies and Material Design". The goal is for pre-service teachers to create materials within the framework of specific knowledge acquisitions linked to their professions and use them in actual teaching situations. Four-course hours are assigned to this course. Two hours of theory and two hours of practice are required each week in all teacher preparation programs (Uzungöz et al., 2017: 318). The goal of this course is "... It is aimed to utilize the materials used", as stated in the YÖK (Council of Higher Education) course definition. It is to create, execute, and evaluate materials in a way that makes teaching and learning processes effective and efficient. (Öztürk& Öztürk, 2015: 63). The goals of this course are to develop pre-service teachers' cognitive, physical, and affective attitudes and behaviors in the learning-teaching process using instructional technologies and materials, as well as to promote multidimensional thinking, concretizing abstract situations and making them understandable (Karataş &Yapıcı, 2006, pp. 313–314). Rapid advancements and changes in every field in our nation and around the globe have a significant impact on education and training studies, and this scenario has prompted scientists to look for a variety of solutions in order to offer education of a higher caliber. Constructivist education has begun to be adopted in our nation in recent years in light of these advancements (Gün, 2017). Computer technology unavoidably generates a crucial infrastructure for assuring ongoing learning in the educational setting in the modern world, which is known as the information

and production age. It can be argued that instructional technology and material development continue to exist as a significant branches of science with the introduction and advancement of these fields of study (Özdemir et al., 2006: 1385). Both teachers and students in Turkish lessons must employ educational technologies and materials in order to develop knowledge and acquire specific skills, in accordance with the constructivist learning paradigm. The interests and needs of the pupils are not taken into consideration because the classes are solely taught using Turkish textbooks and a few exercises. Because of this, it's critical to employ strategies that promote high-level thinking, such as critique, interpretation, analysis, and synthesis, while also taking into account students' interests and needs (Arslan, 2009: 150-151).

The teaching profession, which is thought of as imparting knowledge to students in the conventional sense of education, actually opts for a simple solution. With the aid of instructional technology and resources, it is important to put in effort and perseverance in order to deliver knowledge and promote active and experiential learning. The Turkish Language and Literature Curriculum is based on the principle of examining and interpreting texts belonging to literary periods and communities under the headings of "literature", contrary to the traditional understanding, as a requirement of the constructivist learning approach used in 2005-2006. It is possible to say that the aim is to enrich the text by giving up the traditional structure, theme, language, expression, meaning and interpretation, based on the information that does not benefit the student in terms of literary taste. This is done by focusing on understanding, skills, and knowledge of text analysis (Yazar, 2014). Turkish teachers' knowledge of and proficiency in using technology is directly tied to how well they can integrate it into their lessons. In other words, a Turkish teacher who lacks the fundamental technological skills necessary to use technology effectively will not be able to make use of all the benefits it presents. To improve the caliber of Turkish instruction, however, the construction of lessons using technological possibilities is crucial. Turkish instructors should be proficient in using technological tools including computers, televisions, the internet, and projectors in the classroom. Regarding teacher education and competency, it is also crucial to observe and assess the fundamental abilities, knowledge, and skills in this scenario (Karagül, 2020: 472). Choosing the right equipment is crucial in today's educational system, where technology chances are numerous, complex, and intense. Even if it provides advantages, it should not be overlooked that if it is not used properly, some unfavorable events could happen. The function of teachers is critical at this point. When used for the

intended purpose, information and information technologies in literary classes will ensure that the course material is delivered in a systematic, effective, and efficient manner, lessen the workload of teachers and students, save time, and improve educational quality. Students and teachers can access a robust electronic library system thanks to the employment of technology instruments (Çifçi, 2013:11-13).

The Importance of Material Design in Turkish-Literature Teaching

The teacher is undoubtedly the most basic element of every educational institution. The teacher's profession and personality traits are directly related to the effectiveness of the system. Effective educators have the knowledge, skills, and attitudes specialized in their disciplines, as well as the broad cultural competence required. Although it is very important for all teachers to be qualified, especially in Turkish language and literature/Turkish teachers need to be trained even more qualified as users and teachers of this language (Saraç, 2005).

The principles of instructional technology and material development are linked. For the construction of accurate, current, and efficient course materials, instructional technology is used. Teaching resources are tools that teachers provide to students in a variety of settings to aid in learning. These tools include printed items that are initially understandable, such as documents, images, models, etc. It can be offered through a variety of media, including CDs, DVDs, Internet pages, and software that requires more advanced technology to access its content. The pre-developed curriculum's instructional materials should be constructed in accordance with their requirements. Currently, proper knowledge of the material to be taught and the persons who make up the target audience is required for the suitable approach and choice of pertinent resources (Kaya, 2006: 26).

All instruments and equipment used to support teaching in or outside of the classroom, from pencils to distance learning networks, are referred to as education and instructional materials (Gün, 2017, p. 15). The teaching aids and resources employed not only contribute to the achievement of the curriculum but also prevent the lesson from becoming boring and guarantee that it is delivered in an enjoyable manner. Additionally, it ensures the efficient use of time, which boosts the lesson's effectiveness (Kazu & Yeşilyurt, 2008, p. 176). “In today's rapidly changing and developing world, individuals are not expected to acquire and memorize information from a single source, on the contrary, it is aimed to raise individuals

who know the ways of accessing information, can use it, and can create solutions methods to overcome the problems they encounter. The use of teaching materials prepared according to the principles of instructional technologies is important for individuals to acquire these characteristics and for teachers to design effective and interactive learning environments" (Yanpar Şahin & Yıldırım, 1999: 1). Teaching materials are an important element in increasing the quality of education (Gündüz & Odabaşı, 2004). The utilization of instructional materials in any teaching or learning scenario is what we refer to as "teaching". Students can use the actual objects known as teaching materials. A learner engages with the content while using it in this manner. A student may be required to manipulate the instructional material during this kind of engagement in order to voice their opinions on the issue and concept presented. The teacher (who is the source) is then informed by any feedback from such usage as to the degree to which a student has accomplished a teaching objective (Amadioha, 2009). One of the many features of the materials is suitability for student level, usefulness, suitability for purpose, providing permanent learning, attracting attention, affordability, being clear and understandable. Other features include making the lesson easy and fun, making the lesson understandable, and providing permanence in learning (Bozpolat & Arslan, 2018: 75). In this regard, the usage of various teaching resources during the learning-teaching process is crucial to ensure the long-term retention of knowledge. Modern teaching tools, particularly computers and computer software, are used in learning environments, even though older teaching tools still have their place. Although it is possible to find most of the teaching materials ready-made, material design may need to be developed due to some environmental conditions and the special conditions of the subjects. In this context, it is very important for teachers to be competent in material development (Süral & Anılan, 2005; Yilmaz & Hebebci, 2022). Along with materials, material development and material design have emerged as significant careers in tandem with technological advancements. The foundation of an effective learning and teaching environment will be the design and development of alternative materials that teachers and aspiring teachers can utilize in the course. Knowledge and expertise in material design and development are crucial in this regard (Karakuş, 2012: 3). Turkish instruction in Turkey begins in first grade and is influenced by the high school curriculum. In this setting, it is intended that students will benefit in the areas of reading, hearing, speaking, writing, and grammar when learning Turkish. Here, helping the student translate these gains into behavior is the key goal. For this reason, it is crucial for a Turkish teacher to be familiar with the resources available for the development of language abilities, to be aware of the features of use, to be able to create

materials from an instructional design perspective, and to mentor their students in this area (Keray Dinçel, & Savur, 2019: 81). Visual resources created by instructors and students that encourage concretization and lifelong learning are included in material design. They can increase the students' enjoyment of the class by carrying out their learning and teaching activities effectively when Turkish language and literature teachers prepare and employ beneficial materials in accordance with a predetermined plan. The 2018 Turkish Language and Literature Curriculum's framework places a strong emphasis on material richness as a way to guarantee lasting learning and effective lesson delivery. In order to develop the habit of learning by doing, which developed concurrently with the features of the constructivist learning method and has been included into educational programs in Turkey since the mid-2000s, it is crucial to use rich materials (Gün, 2017; Ozturk & Ozturk, 2022). It is apparent that by incorporating some technology-supported teaching approaches in educational settings, the learning-teaching process can be made more successful. Because of this, it's crucial that teacher candidates have the appropriate instruction and tools for the needs of the time. Studies have demonstrated that in this context, courses relating to material design help lessons by, among other things, attracting students' attention, assuring their active involvement, making the lesson enjoyable, facilitating learning, ensuring the permanence of learning, and enhancing creativity. One may claim that the development and application of instructional materials for the teaching of the Turkish language and literature are crucial for the success of the course (Bulut, 2021: 178). Turkish teachers should help with the concretization and permanence of the lesson within the context of teaching Turkish by giving them the tools to create materials for their students as they gradually move into the abstract operational stage without disregarding secondary school students' developmental needs. Similar to when teaching a foreign language, the design of the course materials plays a crucial role in highlighting certain concerns and conducting engaging and successful instruction (Keray Dinçel & Savur, 2019: 82).

Conclusion

Language is referred to as the most fundamental form of understanding and expression for individuals. Language education and training, which is learned as acquisition in the immediate environment from the viewpoint of the individual and provided at educational institutions according to a systematic and precise plan, develops as a significant field. Particularly, the tactics, methods, and procedures required by the modern education approach

were embraced in education, together with the constructivist learning approach and student-centered teaching approach, both of which began to be used after 2005-2006. This method, which serves as the foundation for Turkish instruction, has surely been accepted as the foundation for teaching Turkish language and literature as well as other courses. Because literature is a source of "experience" and "word" at the point of "raising excellent and joyful persons and revealing aesthetics", it is unquestionably important to teach it in the chosen education and training programs. Literature, which is an artist's reflection of life and a mirror of life, is the means by which a person can perceive, comprehend, and make meaning of life.

Literature: It is a way to reflect on and experience suffering, joy, happiness, dreams, and disappointments, as well as the artistic representation of life. In this setting, literature serves numerous purposes on an individual and social level. Language and literature, a socializing tool, together constitute the foundation of good communication. Literature's primary resource and fundamental component is language. Language and literature, a socializing tool, together lay the groundwork for efficient communication. Literature is composed of language, which is also its fundamental component. Teaching technologies, material design, and development are unavoidable in the "information age" environment, where people are continually being warned by a variety of stimuli. Making the teachings engaging, entertaining, and exciting in this context, drawing the student's attention to the lesson, offering motivation, assuring long-term learning, etc. It has been found that instructional technologies and material design are significant in the research in the literature. Turkish language and literature teachers should therefore continually update their knowledge in line with modern demands and be open to new ideas that could improve the teaching-learning process. Additionally, teachers should conduct themselves in accordance with the knowledge, abilities, and skills outlined in the Turkish curriculum (MEB/Ministry of National Education, 2019) and the Turkish language and literature curriculum (MEB/Ministry of National Education, 2018). Regarding instructional ethics as well as professional ethics, this behavior is crucial.

Notes

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Chapter 5 - Students and Mental Health: Role of Psychological Immunity in Prevention of Student Suicides

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Chapter Highlights

- Students especially adolescents face a lot of stress and pressure which can be further categorized into academic, peer, parental, and societal pressure.
- This results in reduced ability to handle daily stressors, lack of coping, and poor stress management skills.
- The inability to handle stress and pressure causes an increased risk of students committing suicide.
- The rise in incidences of untimely deaths due to poor mental and socio-emotional health among adolescents is increasing tremendously.
- Psychological Immunity (PI) is a term coined by Olah (2000) and refers to a system of adaptive resources comprising positive personality characteristics which act as psychological antibodies during stress.
- PI helps the individual to cope with daily stressors.
- This chapter attempts to study the role of Psychological Immunity in the prevention of student suicides, especially among adolescents as the target population.
- The findings of the chapter indicate that Psychological Immunity plays a key role in supporting student mental wellbeing, improving resilience, and raising levels of coping ability among students to deal with everyday stressors and better management of stress.

Introduction

The National Crime Records Bureau (NCRB) in its 2020 report indicated an increase of 10% in suicides. The suicide rate is defined as the number of suicides per lakh of the population. Research studies revealed that comprehensive suicide prevention comprising parenting programs, supporting persons at risk, psychotherapy, timely counseling, and intervention helped to reduce and even prevent the occurrence of untimely deaths (Pandey, 2017).

Student suicides: A look at the National Statistics

Suicide has turned into a public health menace. As per a report published in the Hindu (September 01, 2021) the number of accidental deaths and suicides increased tremensdously and it was seen that student suicides touched a new high of 12,256 cases across India contributing to nearly 8.2 % of the total number of suicidal deaths. The reason for this spike was believed to be linked to the COVID-19 pandemic which resulted in mental health issues as a result of social isolation coupled with the fear of infection, the occurrence of infections and diseases, lack of awareness about the virus, its spread and control along with other notable challenges. Restricted or no access to social and emotional stimulation offered in classrooms, playgrounds, and other social situations, with friends, teachers, and peers led to increased social ideation and associated behaviors such as attempted suicides (Nanisetti, 2021). Thoughts about uncertainty, and a bleak and broken future started troubling the minds of students as a result of the shutting down of physical classrooms, cancelation of exams, and lack of access to digital and online resources, which further led to a sudden and high rise in student-led deaths.

Psychological Immunity (PI): Development of Coping Mechanisms and Resilience

Psychological Immunity (PI) can support the ability to handle stress and strain by developing a coping mechanism and in turn foster the development of a resilient capacity. The development of PI can be used to support the influential model of the behavioral immune system through the development of healing mental strategies and coping behavior (Rachman, 2016).

Mindfulness Activities and Development of PI

Mindfulness activities help in lending support towards the building of PI among the students. Mindfulness can be understood as a state of mind with a non-judgmental outlook and focus. It includes certain elements like awareness (being tuned into ones surroundings-sights, sound, and smell), focus (being aware of the major focus, paying attention to the present moment), acceptance (having a sense of acceptance and gratitude for one's life events with no thought of controlling or altering the same for one's benefit (‘health ageing and physical disability’). A growing body of literature is focusing on the use of Mindfulness-Based Interventions (MBIs) for the treatment and management of life-threatening conditions. Hence this paper attempts to understand the nature and causes of student suicides. It also recommends the use of mindfulness techniques to support the development and strengthening of PI thereby fostering the maintenance of mental well being especially among emerging adults.

Table 1. State-wise Data on Student Suicides in India

State	Number of student suicides cases
Maharashtra	1648
Odisha	1469
Telangana	489

Table 1 clearly shows the highest spike in student-led deaths in the state of Maharashtra, which is leading with 1648 cases, followed by Odisha (1469 cases) compared to 379 deaths happening in the year 2019. Telangana follows closely at the third position with 489 deaths in 2020 compared to 426 deaths in 2019. The NCBR 2020 indicates Delhi as the Union Territory reporting the maximum number of student suicides.

Objectıves and Research Questıons

The objectives framed for the present study include:

1) To study the rise in the percentage of student suicides over the last 10 years through a desk review of relevant literature and government reports.

2) To explore the perspectives of experts regarding mental health and suicides among students through focused group discussions and interviews.

3) To explore the perspectives of experts about the prevention of suicides through the development of Psychological Immunity among students.

To answer the same, the framed research questions are as follows:

1) How much is the rise in cases of student suicides in India over the last 10 years?

2) What are the perceptions of experts regarding mental health and suicides among students?

3) What are the perceptions of experts regarding the prevention of suicides through the development of Psychological Immunity among students?

Research Methodology

Literature Review

A desk review of the literature was conducted for objective-1 and research question-1 using several online databases such as National Digital Library (NDL), Google Scholar, JSTOR, and NCBI. The combination of search terms used were Psychological Immunity (PI), resilience, students, mental health, suicides, coping, and mindfulness among other such terms. The literature searched was limited to peer-reviewed articles, newspaper, and government report from 2011-2021 (the last 10 years). Articles on non-related topics were not considered. Abstracts of identified studies were then studied to determine which studies met the criteria. The relevant articles were downloaded to find out the status of student suicides in the country. The data was then coded onto spreadsheets including author name, year of publication, place of study, publisher details, and major findings. Additional notes on any other important issue being addressed were made. The data obtained from the review literature was coded as a) rate of suicides among students over the past 10 years, divided into age groups below 10 years, 11-15 years, and 15-18 years, b) reported cause of untimely death, and c) expert advice suggested in the reports/studies.

Sample

For objective-2 and research question-2, 10 experts belonging to the field of child psychology, human growth and development, guidance, and counseling were identified for the present study using convenience sampling, based on accessibility and availability. These experts were from different parts of the country and consisted of both male and female

professionals having more than 10 years of experience in their respective fields of expertise. The profile of experts is highlighted in the table below:

Table 2. Sample Description

Variable		Number
Gender	Male	5
	Female	5
Expertise	Psychology	5
	Human growth and development	2
	Guidance and counseling	3
Location	North	4
	South	3
	Central	2
	West	1
Total		**10**

Table 2 shows that the sample can be described as consisting of both male and female participants (N=10 where 5 are male and 5 are female). The experts belong to the expertise of three different areas and hail from their different areas namely North, South, West, and Central India.

Focus Group Discussion (FGD)

It was conducted with 10 experts and was led by the researcher to identify their perceptions, suggestions, and opinion regarding mental health and suicides among students and their prevention. 20 questions about the rising rate of student-led suicides over the last decade, causes of student suicides, nature of student suicides, the role of the family especially parents and siblings, school teachers, peers, and school management in timely handling of student stress levels for effective prevention of suicidal deaths along with the use of mindfulness techniques and development of PI was discussed. The nature of the questions framed is discussed below:

Table 3. Details of the Research Tool

Number of questions framed	20
Subthemes framed	3
a. The rising rate of student-led suicides	05 questions
b. Causes of student suicides	05 questions
c. Prevention of student suicides	10 questions

Interview

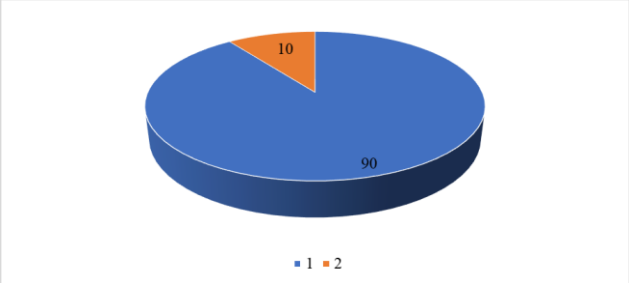
Six experts hailing from the fields of Psychology (n = 3), Guidance and Counselling (n= 2), and Human Growth and Development (n = 1) were selected purposively for the interview based on their consent and availability. A structured interview schedule was specifically designed to meet the needs of the study and was titled 'Understanding and Prevention of Student Suicide' (UPSS). The schedule consisted of 5 open-ended and 5 closed-ended questions about the rise in student suicides and their prevention focusing mainly on the role of PI.

Findings

The information obtained from the FGD was divided into the identified sub-themes. The data was analyzed using both qualitative and quantitative methods. The findings obtained are listed below:

The Rising Rate of Student Suicides

The experts believed that student-led suicides (in the age range of 11-25 years) had risen tremendously over the last decade. The findings from the FGD are as follows:



Key: 1=yes and 2=no

Figure 1. Perspectives of Experts regarding an Increase in the Number of Student Suicides

As evident from figure 1, 90% of experts agreed that the rate of student suicides has increased over the past decade and a mere 10% of participants disagreed by stating no. This is in line with the reports of the National Crime Record Bureau (2020). This can be inferred with high seriousness as the rise in the number of untimely deaths among students exposes the current status of student's mental well-being. The students face several challenges and stressors in daily life; however, they find themselves unable to cope with the strain and take the extreme step of committing suicide which leads to untimely death. A Hindustan Times report points out the lack of support for vulnerable students even among top universities across the country leading to the increased number of student deaths (Hindustan Times Editorial, 2021).

Causes of Student Suicides

They agreed that rising levels of study-related stress and academic pressure, family problems, lack of parental awareness about warning signs of stress, and inability to handle daily stressors were the leading causes behind the rising number of untimely death. These details are shown in the figure below:

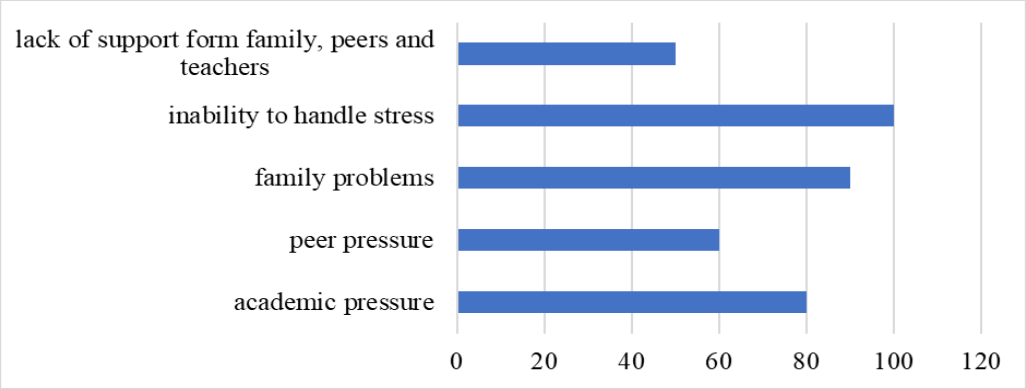


Figure 2. Perceptions of Experts towards Causes of Student Suicides

Figure 2 represents the perceptions of experts towards the causes of student suicides. As seen from the table, 100% of experts (n=10) believed the inability to handle stress and manage stressful situations was a primary cause of student suicides. 90% of experts (n=9) felt family problems were a factor to blame for the rising number of cases. Academic pressure, which is generally believed to be a leading cause of death among students stood at 80% (n=8), while

peer pressure stood at 60%. The focus group discussion also yielded some other possible causes leading to untimely deaths which are listed below:

- Fear of infection and disease from self to family.
- Lack of jobs and impending economic recession due to the lockdown.
- Uncertainties about the near future especially jobs and employment avenues.
- Extreme social isolation and absence of socio-emotional support especially during the pandemic.
- Inability to afford tech tools for online classes leads to lag in studies and poor performance.
- Over-expectation among parents, family members, and educators.
- Lack of self-belief to overcome challenges and stressors.
- Overuse of digital tools and increased screen time cause a rise in mental health issues.
- Dependence and addiction to social media for framing a self-image, beliefs, and perceptions.
- Death of parent/caregiver especially in the pandemic due to COVID or another disease.

Findings from Interview

The six experts who agreed to be part of the interview shared their expertise and perceptions based on the open-ended structured questionnaire framed for the study. The findings of the interview are summarized below in form of interview transcripts which were coded into two main themes:

Causes of student-led suicides

a. Lack of ability to handle stress.

b. Lack of support and care.

Need for mindfulness and PI training

Expert-1: Highlighted the need for care and support for the students, especially during such times of pandemic where the students are facing extreme isolation due to the closure of academic institutions. He pointed out the need for one-to-one guidance and counseling sessions to be given regularly in online mode (offline wherever possible). School teachers

and college faculty should be alert to identify telltale signs of student facing depression or undergoing panic issues.

> "There is an urgent need among parents and teachers to identify the telltale signs of depression among students."

Expert-2: She discussed the need for incorporating mindfulness training into the curriculum for students. It is a critical need for students to learn and regularly engage in mindfulness activities like guided meditation, yoga, and simple relaxation activities such as listening to music, reading motivational books, hiking or trips to hills and other natural environments, stretching, and swimming.

> "Students need to engage in mindfulness activities like yoga, controlled breathing, hiking, and other such activities to enhance their ability to handle and control the stress."

Expert-3: He focused on the need for training and awareness creation among parents and teachers to identify major signs of depression and stress in students in the age group of 11-25 years. The signs were shown to include mood swings, crying without any reason, loss of temper, indrawn and withdrawn nature, lack of socialization, and sudden drop in performance.

> "Parent and teacher sensitization toward the need for mindfulness training for supporting and development of mental health among youth is the key need of the hour."

Expert-4: She stated that youngsters in the present times are dependent on social media and highly influenced by the same. There is an urgent need to create introduce mindful eating, breathing, movement, and meditation where the student focuses on the present. She spoke about increasing student awareness in the following areas: awareness and tuning into the present moment by actively attending to the sights, sounds and smells, and sensations around them. Improving focus through guided meditation and appropriate relaxation techniques is the key to promoting students' stress management. This will also lead to increased acceptance of self and help them to observe unpleasant situations without impulsive reactions and wrong judgment.

> "There is a need to create situations and opportunities for students to accept themselves in the true sense, and be focused, and develop an awareness of their surroundings."

Expert-5: He stated that students are highly dependent on social media which influences and adversely impacts their life. As a result of increased screen time during the pandemic, students have shifted to a purely online environment of study and socialization, reducing the human touch. This creates a need to support students both at the social and emotional levels using appropriate measures.

> "Addiction to social media and digital gadgets is harming the mental health of the youth today, making them prone to episodes of anger, depression and thereby increasing their vulnerability to commit suicides."

Expert-6: she stated that family problems and lack of management of stressors are reported to be leading causes causing student suicidal death as per NCRB report 2020. This can be controlled and managed effectively through a proper understanding of the needs of today's youth, especially in the pandemic era.

> "There is an urgent need to understand the basic needs of today's youth. Without understanding their needs it is very difficult to cater to them effectively"

Discussion

The general perception about student suicides is examination-related stress, fear of failure in examination, and inability to fulfill preconceived parental, peer, and self-expectations however the report by Nanisetti (2021) indicated a shift in the cause of student deaths in the pandemic owing to uncertainties in the promotion to the next level, stress among students due to cancellation of exams and fear of career and job prospects in the lockdown among graduate students. This finds support in the findings of the present study which show that experts believe that the inability among students to handle and manage stress was the leading cause of the increase in student suicides, followed closely by problems in the family and academic pressure among the leading causes of student suicide in the country. The present study recommends the need to incorporate mindfulness techniques among students for stress management incorporating mindful meditation, mindful walking, mindful attention, and mindful relaxation techniques where the student is focused on his surroundings (sights, smell, and the environment). Such techniques are believed to develop psychological immunity among students which will play a key role in helping them to make daily stress and challenges (Li., 2021; Ozturk & Ozturk, 2022).

Recommendations

The study indicates that suicides are not restricted to a particular group, class, or section of society. The number of suicides among students is increasing rapidly, as seen from statistical reports published from time to time. Research studies are indicating that student suicides especially among Indian adolescents are a matter of great concern and consideration in the field of academic, psychological, and social science research. Thus, it is extremely important to explore and understand the causes of student suicides which includes several socio-economic, cultural, psychological, and environmental factors.

- It is critical to identify and understand the varied causes of student suicides.
- The administrators, educators, and teachers need to make relevant and appropriate changes in the examination and academic systems.
- There is a need to reform family environments and improve parenting styles to effectively meet the needs of all students, especially adolescents.
- Psychological immunity is currently seen as the ability of an individual to handle and manage stress through the development of psychological antibodies, hence steps need to be taken to increase and develop PI among adolescents.
- Training in yoga, mindfulness, and meditation needs to be provided to adolescents.

Conclusion

The study by Pandey (2017) clearly indicates the need for exploring, and identifying causal factors of student suicides especially among adolescent and young adults in India. The identification and understanding of the major factors will further guide teachers, trainers, parents and key stakeholders to better understand and cater to the needs of such students having suicidal ideation through reduction of academic pressure, formation of positive social bonding, promotion of mindfulness training in the form of meditation, upholding of healthy and active lifestyle, implementation of healthy daily habits, listening to music, engagemnt in daily routine activities like gardening all of which which can support the building of Psychological Immunity. The psychological immune system will protect individuals through generation of a coping mechanism which will further help an individual towards better management of stress and strain thereby also promoting mental and physical well-being (Olah, 2000; Shah, 2021; Shengji Li. (2021).

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Chapter 6 - Research and Inquiry-Based Learning Model in Turkish Teaching

Abdulkadir Kırbaş, Mesut Bulut

Chapter Highlights

- New approaches to teaching Turkish expect students to research, question, learn by themselves, and take responsibility for their learning.
- In today's world, every civilization and nation aims to raise future generations according to the needs of the age through education and training activities. It tries to carry out this action in a way that internalizes national and universal values without departing from national values.
- In the century we live in, education programs have been examined and questioned to find solutions to the problems encountered in the field of education in our country as well as in developed countries in the field of education such as Finland, New Zealand, Japan, and Canada.
- When the literature is examined, it has been determined that most of the education problems encountered at the national and global levels are caused by traditional teaching methods.
- This study is to determine the application of the “Research and Inquiry-Based Learning Approach”, which is one of the 21st-century skills, in Turkish lessons.

Introduction

In our constantly changing world, the developments in the field of science and technology and the struggles of the countries not to lag behind these developments have led to the emergence of new approaches in the field of education. New approaches to teaching Turkish expect students to research, question, learn by themselves, and take responsibility for their learning. Because it is now aimed that students can learn to learn (Juntunen & Aksela, 2013). In today's world, every civilization and nation aims to raise future generations according to the needs of the age through education and training activities. It tries to carry out this action in a way that internalizes national and universal values without departing from national values.

Today's developed countries aim to raise individuals who have adopted both national and universal values, can respond to the needs of the age, and understand and interpret what they read and listen to. In addition, the curriculum is updated in line with raising forward-thinking generations who can make inferences by the requirements of the age, think critically and creatively, solve the problems they encounter, and have a high analysis and synthesis direction. In other words, the common goal of states today is to raise individuals who are integrated with their national values and who carry the characteristics of the global world. Because individuals with these characteristics determine the future of nations.

Raising the human model in the desired model cannot be done randomly, without purpose, without a plan and program, without purpose and scope. Because individuals with these characteristics determine the future of nations. Raising the human model in the desired model cannot be done randomly, without purpose, without a plan and program, without purpose and scope.

To raise qualified individuals in all respects, countries have to carry out their education and training activities consciously and within a certain program. For this reason, developments in science and technology in our rapidly developing world have paved the way for the emergence of new and current learning approaches, along with radical and new approaches in the field of education. Changes and developments in all areas of life affect the education programs in general and the Turkish Language Curriculum in particular. Changes and developments in all areas of life affect the education programs in general and the Turkish

Language Curriculum in particular (Bulut, 2022; Bulut & Kirbas, 2022a, 2022b; Erkek, 2022). While the curricula in our country were being prepared, the change that took place on a global scale did not remain unfamiliar to innovations. It is aimed to raise individuals as entrepreneurs, creative, critical thinkers, with problem-solving skills, loyal to national and cultural values, and self-confident.

In the century we live in, education programs have been examined and questioned to find solutions to the problems encountered in the field of education in our country as well as in developed countries in the field of education such as Finland, New Zealand, Japan, and Canada. When the literature is examined, it has been determined that most of the education problems encountered at the national and global levels are caused by traditional teaching methods. This study is to determine the application of the "Research and Inquiry-Based Learning Approach", which is one of the 21st-century skills, in Turkish lessons.

Turkish Teaching

Since its existence, the individual has resorted to various ways to express his feelings, thoughts, dreams, and many similar facts or situations. Language is the most important primary source of the individual who needs communication processes such as understanding and telling by nature. Language is the oldest and most comprehensive communication tool of the individual. Mother tongue education is a planned teaching process that first starts in the family and then develops within certain plans, covering the correct, aesthetic, and effective use of Turkish. The purpose of teaching Turkish is to develop skills (listening, speaking, reading, writing) that enable individuals to express their feelings and thoughts fully and accurately (Kavcar and 1998: Özbay,2013).

Following are the Turkish teaching goals established by the Ministry of National Education through Turkish lessons:

1: Developing listening/watching, speaking, reading, and writing skills,

2: Ensuring that they use Turkish consciously, correctly, and carefully by the rules of speaking and writing,

3: Ensuring that they reach language pleasure and consciousness by enriching their vocabulary based on what they read, listen to/watch, and develop their worlds of feelings, thoughts, and dreams.

4: Enabling them to acquire the love and habit of reading and writing,
5: Ensuring that they express their feelings and thoughts and their opinions or thesis on a subject effectively and understandably, verbally and in writing,
6: Developing the skills of researching, discovering, interpreting, and structuring information,
7: Developing the skills of accessing, organizing, questioning, using, and producing information from printed materials and multimedia sources,
8: To enable them to evaluate and question what they have read with a critical point of view,
9: Ensuring that they attach importance to national, spiritual, moral, historical, cultural, and social values, strengthening their national feelings and thoughts,
10: Türk ve dünya kültür ve sanatına ait eserler aracılığıyla estetik ve sanatsal değerleri fark etmelerinin ve benimsemelerinin sağlanması amaçlanmıştır (TDÖP, 2019: 8).

According to the Turkish curriculum, learning the fundamentals of the four languages is the main goal of Turkish education. To ensure that students progress at the necessary rate in areas focused on understanding and explaining, it focuses on the four language skills that are designed to serve as the foundation for other skills.

Basic Language Skills

The first things that come to mind while thinking of Turkish language basics are listening, speaking, writing, and reading abilities. These are vital abilities that are used throughout a person's entire life. In this regard, skills cannot be viewed as developing independently of one another. The Turkish Curriculum's objective is to give students the right learning environment so they can apply these skills to their daily life.

Listening Skill

Listening skill, which is an effort to understand the environment of the individual, is the first language skill that the individual acquires in the mother's womb. (Akyol, 2010). For this reason, it can be said that the first basic language skill acquired is listening skills. Many definitions have been made in the literature on listening. According to Johnson (1951), listening is the ability to understand verbal communication and to respond effectively to communication. Umagan (2007: 149) defines listening as an effort to fully receive and

interpret the message for the communication to take place, rather than passively watching the other party.

According to Aytan (2011), listening is a skill that emerges on its own and is frequently overlooked, lost, or forgotten. Cihangir (2004) also highlights the fact that listening skills can be enhanced through education, the lack of adequate research in this area, and makes the case that multidimensional studies should be used to foster the development of good listening skills.

Speaking Skill

The most fundamental ability that sets humans apart from other living creatures is the ability to verbally convey needs, wants, and desires. Speaking, according to Güneş (2014), is the act of putting thoughts and feelings into words while also elucidating mental processes. By following the rules of speaking, verbally expressing oneself, and speaking in line with genre, method, and techniques, MEB (2009) defined the learning of speaking skills. These accomplishments are crucial for students to express themselves, communicate, and grow as thinkers (Aksoy, 2021).

As crucial as the topic and the way it is presented are the speaker's intonation, diction, accent, and pronunciation. Exercises include practicing frequently, listening to well-spoken speakers, and imitating them are excellent for developing this skill (Kurudayıoğlu, 2003).

Reading Skill

One of the language skills that enable an individual to become a social being by using their mental and emotional skills and to be aware of the cultural accumulation in their life is reading ability. Reading ability has an important value in developing people with advanced cognitive and affective skills (Sevim, 2019).

MEB (2009) described reading as a multifaceted activity involving the eye, voice, and brain, including seeing, perceiving, vocalizing, understanding, and mental organizing. Reading ability can be defined as a person's ability to analyze what he reads. It is also the process of figuring out what the person in the piece wants to be presented to them. Realizing comprehension and interpretation is reading's primary objective in this situation.

Writing Skill

The person who needed to express themselves sought to do so in many ways. He did so either orally, in writing, or with the use of some symbols and instruments. The capacity to convey one's feelings, thoughts, wishes, and desires in writing following a particular experience is referred to as writing ability. According to the Turkish Curriculum, writing is the act of verbally expressing one's emotions, ideas, and knowledge. (MEB, 2009).
It can be argued that the abilities included in the Turkish Language Curriculum are crucial for teaching Turkish and that mastering them is beneficial in both daily life and academic settings.

Modernized Learning Models

As a result of educators' efforts to discover the ideal learning environments, new ways of learning and teaching have arisen. Each learning model has historically either influenced the development of another learning model or been criticized for its shortcomings. Numerous learning models have been developed as a result of research into topics including what influences learning, what factors are more active, and whether education serves its intended goal. This section discusses the primary learning paradigms.

Mastery Learning Model

Different learning models have emerged as a result of the personal traits of individuals. The mastery learning model created by Bloom is one of these models. In this study, Bloom focused attention on individual differences. Bloom based his theories on the mastery learning model on those in his essay titled mastery learning, which he developed with his students in the 1960s. Finding techniques that will be based on the whole development of individuals while taking into account individual differences should be the most basic objective in education, according to Bloom (Bloom, 1968).

He contends that every student may learn easily if the right circumstances and time are present under the mastery learning paradigm, which attempts to educate every learner. This method uses all instructional techniques while taking into account each student's demands, and if enough time is given, all students can learn at a high level (Guskey, 2007).

The goal of education today, according to current thinking, is to minimize inequalities between students' unique learning levels rather than preserving or increasing them. The success of simply talented pupils should not be enough for educational systems in this regard. Every learner has to work on honing their skills (Sever, 2004).

Model for Active Learning

All of the phenomena that include learning by doing while exploiting the existing circumstances more effectively are referred to as active learning. In contrast to conventional methods, active learning is simply the presenting of information in a way that fosters awareness (Meyers and Jones, 1993: 19). Active learning is a learning strategy that incorporates the constructivist educational model used today. Active learning, like the constructivist approach, aims to improve students' self-questioning, self-regulation, information access, knowledge construction, knowledge application to new topics and situations, knowledge production, and social communication and cooperation skills while they're doing it. 2018 (Province).

Effective and long-lasting learning is greatly benefited from active learning. Because the fundamental tenet of active learning is to ascertain the students' fundamental learning objectives, ascertain their current degrees of learning, and ascertain the realization of relevant learnings for this goal (Açkgöz, 1999; Demirel 1999).

Important possibilities to develop the human model needed by the age are provided by active learning. In actuality, active student participation is crucial at every step of active learning. Following is a summary of some of the active learning's key characteristics:

• It gives students the capacity to learn and learn.

• The student carries the duty of learning.

• Students take an active role in the learning process and do not just accept the knowledge that is given to them.

• Individual variances are taken into account when teaching and learning.

• Information is not provided to students in a ready-made manner; rather, it is intended for students to discover the information via their investigation and observations.

• There is interactivity among the students. To create shared knowledge, they cooperate and exchange information.

• The pupil has the desire to study. In the course of learning, he accepts tasks and responsibilities without hesitation.
• It boosts pupils' confidence and abilities to self-regulate (Talaz 2013: 10-11).

Cooperative Learning Model

All of the activities that include students interacting with each other to accomplish a common goal are considered cooperative learning (Vahapassi, 1998: 51). It is an effective form of group work that maximizes learning, ensures knowledge permanence, and reduces unfavorable outcomes while solving problems (Felder & Brent, 2007: 34). The cooperative learning model is distinct from conventional teaching approach models in that it centers the student. Their socialization is also aided by the group's interactions with the pupils. Due to these abilities, the growth of social abilities like respectfully listening to one another and respecting one another's ideas when talking adds to the rise in their academic achievement (Johnson & Johnson & Smith, 1991).

Each student should contribute to the learning of a different learner during cooperative learning. The group's common objective is actively pursued by each member. In this situation, a deliberate and consistent investigation is required. The practice of cooperative learning effectively benefits students' cognitive abilities. Additionally, it helps the kids feel more confident in themselves, less anxious about the session, and more inclined to meet their other friends.

Project-Based Learning Model

One method that effectively promotes the development of 21st-century abilities, high-level behaviors, and learning how to learn while addressing both the study's process and its outcome is project-based learning.

Through project-based learning, students can advance their abilities in collaboration, project planning, decision-making, and time management. It is simpler for pupils to remember what they have studied when they can connect what they have taught to knowledge from the actual world. Additionally, as a teaching method, it encourages cooperation in the generation of information and the growth of problem-solving skills (Railsback, 2002). Students with

varying learning preferences can also study thanks to the project-based teaching approach, which enables each student to organize the material in their unique way. Because of this, one of the key benefits of this learning paradigm is that it can accommodate various learning preferences (McGrath, 2003). The project-based learning model is a very thorough strategy. By working on projects, students can engage in many multidisciplinary studies (Scott, 1994).

Multiple Intelligence Learning Model

The debates on intelligence gained a new perspective in 1983 when Howard Gardner proposed his notion of multiple intelligences. No activity throughout life comprises a single intelligence region, according to Gardner, who claims that intelligence areas are numerous. In scenarios like learning, problem-solving, receiving, processing, and applying information, these eight distinct intelligence regions can be employed in eight different ways, or tools, according to the multiple intelligence theory (Yavuz 2001). The following are examples of different types of intelligence: verbal-linguistic intelligence, logical-mathematical intelligence, visual-spatial intelligence, bodily-kinesthetic intelligence, musical-rhythmic intelligence, interpersonal-social intelligence, individual-internal intelligence, and natural intelligence.

Gardner claims that while everyone has a variety of intelligence, not everyone possesses the same set of intelligence. He contends that no test can accurately capture the human intellect and that the most significant aspect of this learning paradigm is that intelligence can be developed (Gardner, 1983).

Brain-Based Learning Model

A wide learning approach, brain-based learning includes learning about topics including the anatomy and physiology of the human brain, the process of learning, and life experiences. Brain-based learning requires accepting the norms of the brain, organizing them, and employing them in teaching, even if brain-based learning underlies it (R. Caine ve G.Caine 2002).

Brain-based learning can be defined as a learning approach that is based on neuroscience, including the fundamental ideas that govern how learning takes place in the human brain.

Brain-based learning aims to produce lasting and significant learning. It organizes the educational process through the physical makeup and metabolic processes of the brain.

The brain-based learning process focuses on how the brain perceives, processes, interprets, connects, stores and remembers messages. According to the brain-based learning approach, learning does not only occur cognitively but a cognitive, affective, and kinetic whole is put to work. From this point of view, it can be said that the brain can perform more than one function at the same time" (Erişti and Akdeniz, 2012: 242).

Constructivist Learning Model

The constructivist learning model is a model in which students are active in the learning process. Students access information on their own. In other words, they learn by making information more meaningful by thinking critically and creatively. (Ormrod, 2004; Prawat and Floden, 1994). In this learning model, the student is at the center of the learning process, learning by focusing on higher-order thinking and cognition rather than rote learning. Knowledge is not learned by rote, on the contrary, it occurs as a result of the student internalizing the knowledge, restructuring it in line with his knowledge, and structuring new knowledge in his mind. The individual uses it to solve the problems he encounters in his daily life by ensuring harmony between the knowledge he has learned before and the knowledge he has acquired afterward (Perkins, 1999).

The constructivist learning model's major goal is to give students the tools they need to guide their learning rather than intervene in what they are doing. In his study, Yaşar (1998) claimed that constructivist learning demands students to take on more responsibility.

Distance Learning Model

Rapid changes and transformations in education and technology have created the need for different education models (Ozturk & Ozturk, 2022). These developments have brought up new searches in education. One of the learning models that respond to these searches is the distance education model, which provides a solution to the inequality of opportunity, provides lifelong education to everyone, and is based on benefiting from educational technologies and mostly self-learning (Kaya et al., 2004).

Today, individuals' need for information, the need to reach information in a short time and to develop themselves; directs individuals to distance education. At the same time, the fact that distance education has removed the time and place limits has made it more important.

Research and Inquiry-Based Learning Model

Learning is the behavioral changes that occur in behavior as a result of experience, experience, and repetition. Teaching includes all kinds of activities done to provide learning, and education activities that provide learning in the desired direction (Senemoğlu, 2012: 4). Many educational models have been developed to create desired and permanent changes in the individual's behavior during the education process. Behavioral, cognitive, and constructivist approaches are at the core of educational models (Veznedaroğlu and Özgür, 2005).

Considering the basic features of traditional teaching practices, the understanding of education that focuses on transferring knowledge, excessive dependence on textbooks, and absolute dominance of the teacher do not lead students to research. This situation causes students to become mentally passive and does not allow the formation of a classroom environment that allows explaining different views, understanding information, and making different interpretations (Deryakulu, 2000: 53-77). For this reason, developments in science and technology in our rapidly developing world have paved the way for the emergence of new and current learning approaches in the field of education.

Bevevino et al. (1999) state that most teachers cannot transfer and apply knowledge about their students, do not have skills such as problem-solving and research, and do not understand the importance of the questions asked. For this reason, research activities allow students to fearlessly explain, confront and analyze previous concepts and misconceptions they have, even if they are wrong.

Learning starts from the immediate environment and information that is compatible with real life is learned quickly. According to Kaptan (1999), the easy adaptation of students to life depends on observing the environment very well and obtaining results by establishing causal relationships between events. Research and examination should form the main purpose of education and training activities. Students develop research activities to solve a certain

problem and reach the result with the teaching method based on research and examination. In this way, the student learns how to solve the problems that will come before him in the future (Vural, 2004: 207).

Today's modern understanding of education aims to teach students the methods of obtaining knowledge rather than giving the knowledge to the students in a rote way. Scientific knowledge can only develop as a result of putting forward and trying new ideas. For this reason, teachers should direct new generations to research, examine, observe and experiment, teach them to collect data and analyze them and enable them to reach generalizations with the results they have obtained to bring an investigative spirit to new generations. This is achieved by inquiry-based learning, which is one of the modern education methods (Kula, 2009:2). Today's education system is based on constructivist learning philosophy and approach. This approach puts the student at the center of education and training activities. This contemporary understanding of education enables students to construct the information in their minds on their own and make sense of it by making the students comprehend the ways of accessing information, instead of giving the information directly to the student with a rote understanding (Kula, 2019).

In the constructivist learning model, instead of memorizing the ready-made information conveyed by the teacher, the student has the opportunity to search for information, interpret and analyze newly learned information, and think critically and creatively. The constructivist learning model also aims to integrate newly learned information with previous knowledge, to think scientifically and analytically, to gain problem-solving and questioning skills, to establish cause-effect relationships, and to gain advanced communication skills (Marlowe ve Page, 1998: 10). In the classroom environment created with the constructivist approach model, the teacher is in the position of a guide in fulfilling these goals. Teachers are responsible for the execution of the curriculum, the preparation of the course contents, and the fulfillment of the goals and objectives clearly stated in the curriculum. In addition, teachers have some important duties such as raising students who can solve problems, investigate, and questions.

In recent years, the foundations of the "research and inquiry-based" learning model, one of the modern education models, were put forward by Johann Heinrich Pestalozzi in the early 19th century. The main purpose of this model is to support the individual to work

independently on his/her own. For this reason, the idea of using inquiry as a learning strategy has been increasingly adopted in the mid-20th century (NRC, 2000). This concept was initially defined as inquiry learning. Then, it is seen that the equivalents such as inquiry-based learning, and inquiry-learning strategy, are used (Türker Altan, 2015; Duran, 2014).

Joseph Schwab (1962) stated that students should learn by performing inquiry-based activities and that teachers should teach subjects based on inquiry (NRC, 2000). Schwab says that students should be given reading texts about scientific research, and they should have discussions about the details such as problems, data, the role of technology, the interpretation of data, and the results of the research in these texts (NRC, 2000). The target is for students to develop an understanding of how scientific knowledge is produced and how scientific knowledge is structured. According to SCAN's (1992) report, it was emphasized that it is more important to acquire problem-solving and thinking skills rather than the theoretical knowledge directly conveyed by teachers in schools. In addition, it is stated in the report that the students have to be directly involved in the problem, collect data, know the concepts, and use materials to gain thinking skills (Altan, 2015:2).

The purpose of the research and inquiry-based learning model is learning to learn, which is the basis of lifelong learning, enabling the individual to maximize these skills by realizing that he has the power to solve problems, research, question, and product knowledge. For this reason, research and questioning should be included in contemporary education to raise individuals with a researcher's perspective, research culture, inquiring thinking, and questioning skills. Inquiry-based education creates important developments in the mental structure of the individual by enabling her to solve problems, analyze, and think critically and creatively. The individual demonstrates these skills through inquiry-based activities. Research-based education provides individuals with the ability to think scientifically and critically, conduct research on their own, structure the information they have obtained, and solve their problems through scientific processes. To raise researcher and questioning generations, the individual should be made aware of her potential through education and the belief that she can develop and use her research and inquiry skills at the highest level should be placed (Erdem, 2020: 173).

The 5E learning model is used in inquiry-based learning, which arouses the interest and curiosity of students with real-life connections, which generally emphasize learning by doing

and experiencing. It is seen that when it was first developed, it was used for discovery, concept teaching, and concept application then it was brought to a five-stage state. In recent years, it has been reinterpreted as 7E with the improvements made by Bybee (2003) and Eisenkraft (2003). It is possible to explain the sections in the 5E model as follows. (Çepni, 2005; Türkmen ve Usta, 2007).

Engage: The teacher uses a short activity to help students connect their past experiences with their current learning. It enables students to reflect on new learning outcomes.

Explore: It is the stage where students are given opportunities to develop new concepts and skills by conducting joint practical experiments. Students make discoveries on topics that they think about actively. These experiences provide a basis for explaining scientific concepts to them in the next steps.

Explain: Students are allowed to explain their findings to others. It provides the teacher with the opportunity to explain the concept and enables students to reflect on the concept.

Elaborate: Teachers develop and expand students' conceptual understanding and skills. Through their new experience, students achieve deeper and broader understanding, greater knowledge, and adequate skill level. Students can do additional activities to make the concept more understandable.

Evaluate: It encourages students to evaluate their learning and provides an opportunity for teachers to evaluate the progress of students toward achieving their educational goals (Gedik, 2019: 19).

According to Orcutt (1997) these activities

1. Increasing their interest in the lesson and motivating them,
2. To increase the learning of scientific knowledge,
3. To teach laboratory skills and apply these skills in daily life,
4. To provide information about the scientific method and to develop students' thoughts.
5. It should be used to develop scientific attitudes such as open-mindedness and objectivity (as cited in Altan: 2015:9).

According to Kula (2009), the purpose of using inquiry-based instruction is to develop students' problem-solving and critical thinking skills and to enable students to use their advanced thinking skills. One of the qualities we expect the individuals we train to acquire is

that they have high-level thinking skills. Thinking starts with a problem, and the solution to the problem prompts individuals to do research (Kalaycı, 2001: 2). The researcher establishes hypotheses, approaches events from a different perspective, makes experiments and observations, collects data, and analyzes them. This ensures the development of higher-order thinking skills in individuals who do research.

Research and Inquiry-Based Learning in Turkish Teaching

The constructivist approach aims to raise individuals who can explore, question, be willing to learn, understand, use and develop new technologies, have self-management, make decisions and take responsibility for their decisions, and have advanced problem-solving skills. In other words, today, the events that occur in our society together with the world are affected by scientific activities. It is necessary to analyze the reflections of these scientific activities on our social life. (Yıldırım and Selvi, 2017).

It has determined by studies that traditional teaching models are insufficient in developing research and inquiry skills, which we call 21st-century skills, and that they are insufficient in raising individuals suitable for the requirements of the age (Arslan,2009: 150). In teaching processes, instead of teaching methods in which the student remains passive, teaching methods in which the student actively participates in learning activities have come to the fore. While preparing the curriculum, is aimed to raise individuals who are suitable for the needs of the age, solve problems, understand what they read and listen to, interpret and solve the problems they encounter in these fields, and have a high ability of questioning and synthesis. These targets have taken their place in the recently prepared Turkish Course Curriculum. In this context, the last updated 2018 Turkish Language Curriculum was created and put into practice with this approach.

The constructivist approach model in Turkey was first started to be implemented in 2005 (grades 1-5) and 2006 (grades 6-8). In the Turkish Curriculum prepared, the goals that put the student in the center and include some higher skills such as producing, thinking, discussing, problem-solving, decision-making, sequencing, classification, and analysis-synthesis are kept in the foreground.

It is aimed to raise individuals who can explore the constructivist approach, and question, are

willing to learn, understand, use and develop new technologies, make decisions and take responsibility for their decisions, and have advanced problem-solving skills. In the prepared Turkish Teaching Program, the goals that focus on the student, including several top skills such as production, thinking, discussion, problem-solving, decision-making, sorting, classification, and analysis-synthesis, have been kept in the foreground (Akçay ve Kardaş, 2019: 95). The renewed Turkish Curriculum is aimed at becoming individuals who understand what they listen to, watch and read. Thus, students have become individuals with critical and creative thinking skills, describing their feelings, thoughts, dreams, and the information they have structured in their minds.

It has been determined by studies that traditional teaching models are insufficient in developing research and inquiry skills, which we call 21st-century skills, and that they are insufficient in raising individuals suitable for the requirements of the age (Yıldırım and Selvi,2017). In addition, students have the upper skills of being an individual who takes responsibility, is enterprising, is in harmony with their environment, makes a habit of researching, questioning, criticizing, and interpreting events, situations, and information based on their knowledge, gaining aesthetic pleasure and sensitive to national values. Gaining these skills is among the specific objectives of the Ministry of National Education.

The Turkish Language Curriculum, which was updated in 2015, 2017, and 2018, prepared according to the conditions of the changing age, has adopted an educational approach based on the concepts of good, true and beautiful so that the student can be a happy individual in a developed society. The Turkish Teaching Program is based on an understanding that enables raising individuals who are responsible, able to solve problems, have advanced decision-making skills, and can think critically and innovatively (MEB, 2017: 3). Among the special objectives of the Turkish course, it aims to raise self-confident individuals who live in harmony with themselves and their society, who know their responsibilities and can fulfill their needs, and who have internalized national and universal values on the other. This understanding, which dominates the Turkish course, has brought to the fore the development of the basic concepts of the constructivist approach, such as questioning, research and problem solving, and critical, analytical, and creative thinking (MEB, 2018).

According to Aydın (2017), Turkish lessons give importance to adopting innovative thinking skills and techniques. In addition to listening/watching, speaking, reading, and writing

language skills in the 2018 Turkish Course Curriculum, there are eight key competencies under the title of basic skills that every individual is expected to gain lifelong learning within the scope of the Turkish Qualifications Framework. These are:

*mother tongue communication,

*communication in foreign languages,

* mathematical competence and core competencies in science/technology,

*digital competence,

*learning to learn,

* social and civic competencies,

* initiative and entrepreneurship,

* cultural awareness, and expression.

Basic language skills were also discussed in Turkish textbooks, and more general and inclusive concepts were also included, taking into account the European Qualifications Framework and the requirements of the age.

With the 2018 Turkish Course Curriculum, which was prepared in line with the General Objectives and Basic Principles of Turkish National Education expressed in the National Education Basic Law No. 1739, the students:

* Developing the skills of researching, discovering, interpreting, and structuring information in the mind,

* Developing the skills of accessing, organizing, questioning, using, and producing information from printed materials and multimedia resources,

* It is listed as ensuring that they understand what they read and evaluate and question them with a critical perspective.

The general purpose of the 2018 Turkish Course Curriculum, is to add that students who complete secondary school adopt national and moral values, use their rights and fulfill their responsibilities by improving the competencies they gained in primary school. To ensure that they are individuals who have acquired basic level skills and competencies, which are expressed in the Turkish Qualifications Framework and also in discipline-specific areas.

In the Turkish lesson, concepts such as active participation, responsibility, learning by doing, research, questioning, and problem-solving skills are emphasized in the learning and teaching

process. In the Turkish lesson, it was emphasized that students should take responsibility for their learning. It has been stated that students should include activities and studies in their social lives to make their learning permanent. These mentioned features are the characteristics of inquiry-based learning models. Considering the new trends in education, this model is suitable for language teaching as it provides student-teacher-environment interaction.

Conclusion

Especially in recent years, it has been seen that developing countries have reviewed their education programs and prepared education programs that put the student in the center to be ahead in the knowledge race. The most important purpose of this age, in which knowledge increases exponentially, is not to transfer knowledge to the student, but to enable the student to understand, comprehend and produce knowledge. To raise individuals suitable for this purpose, students need to gain high-level mental process skills (Tatar, 2006: 20).

To motivate students towards the lesson and make them willing to learn the subject they are studying, it is necessary to give students activities related to their lives and involve students in the activities done in the lesson. It is seen that the main purpose of the Turkish Curriculum is to provide students with the skills to access information. Inquiry-based learning is an innovative approach to the teaching process. It aims to enable students to encounter problems in the learning environment, seek solutions to these problems, obtain information in this process, and turn this information into meaningful wholes. Allows students to work in their way and build their knowledge. Inquiry-based learning is a method based primarily on observation, research, and examination. For this reason, many sense organs participate in the learning and research process, enabling students to be active and gain concrete experiences.

The constructivist approach aims to raise individuals who can explore, question, be willing to learn, understand, use and develop new technologies, have self-management, make decisions and take responsibility for their decisions, and have advanced problem-solving skills. In other words, the events that occur in our society together with the world today are affected by scientific activities. It is necessary to analyze the reflections of these scientific activities on our social life.

The Turkish Language Curriculum aims to enable students to acquire language skills and mental skills related to listening/watching, speaking, reading, and writing that they can use throughout their lives, using these skills to question, research, solve the problems they encounter, analyze and synthesize, and develop themselves individually and socially, It is structured in a way that includes knowledge, skills, and values so that they can communicate effectively and acquire the habit of reading and writing willingly with a love of Turkish. As a result, the 2019 Turkish Language Curriculum was prepared and put into practice according to the research and inquiry-based learning model, which we call one of the 21st-century skills.

Notes

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Chapter 7 - Some (Meta) discourse Markers in English and Georgian Commencement Speeches

Khatia Buskivadze

Chapter Highlights

- This paper investigates the use of textual and interactional metadiscourse markers in two commencement speeches given by English and Georgian speakers from the perspective of Pragmatics and discourse analysis.
- The study is specifically based on Hyland's (2005) framework of metadiscourse markers according to their pragmatic and metalinguistic functions.
- This theoretical framework is concerned with language in use, giving more importance to the context in which they occur.
- Using the qualitative research the author attempts: (1) to look at which metadiscourse markers are used in particular discourse; (2) to collect the data and gather the information through watching video recordings of Georgian and English commencement speeches; (3) to provide a through explanation of addresser's communicative intentions based on their choice of DMs; (4) to identify and analyze English metadiscourse markers in comparison to their selected Georgian equivalents; (5) to present results of the analysis in the form of words in an empirical part of the study.

Introduction

The study of metadiscourse is one of the latest theories in discourse analysis that represents a set of linguistic devices managing social relationship between speaker and listener(s). Hyland (2015) proposed metadiscourse to be a sum of interpersonal resources that organizes a discourse toward its content or the listener. It can also be explained as the way speakers project themselves into their speech to properly interact with their listeners.

Metadiscourse is studied in a variety of spoken and written discourse, including a formal speech such as commencement speeches offered usually to a large number of people on a graduation day. In order for a speech to be persuasive the speaker needs to use a wide range of devices to organize their speech and address the audience when necessary. A smart choice of words leads to the negotiation and the flowing interaction between the speaker and the listeners. Metadiscourse markers also help the audience to understand implicit meaning of the speaker's utterances in order to accurately decode the message of the text.

The research question of this study is the following: "What are interactive and interpersonal metadisourse markers used in Georgian and English commencement speeches and how do they contribute to the organization of a discourse and an interaction between the speaker and the audience? The objectives of the study based on a research question are to classify metadiscourse markers according to their functions and examine their uses in each instance found in the above mentioned speeches.

The uses of this study can be: a) theoretical as the results of the study provide an overview of textual and interpersonal metadiscourse markers in spoken discourse as well as it can be used to analyze the discourse of commencement speech as a particular genre; b) practical use of the research is expected to be speakers' interest to find out how to organize their speech and what devices to use in order to organize their speech properly. The limitations of the study can be: 1) Lack of previous research studies on the topic in Georgian resources due to the reason that metadiscourse is one of the latest theories in DA; 2) A limited access to the data – the researcher was not able to find earlier Goergian commencement speeches online (with/without subtitles); 3) An absence of quantitative research is caused by unavailability of a transcript that would ease the process.

Discourse

In this subchapter will be described the general concepts of discourse analysis and pragmatics, however, previously will be defined briefly about what discourse is. Discourse can be clarified differently with its narrow and broad sense. There is a huge divergence of origins/ sources from which the scholars/researches come, as a result, the term "discourse" is a widely used and yet ill defined (Schiffrin, 1994: 5). Each group of linguists tends to have variety of interests and their theoretical approaches to/perspectives of this concept. The first group use the term "discourse" interchangeably with the term "text" with the idea that when we are dealing with matters of the text we are also dealing with matters of discourse as well (Stubbs, 1983: 9). A text is explained as a piece of spoken or written language considered from the point of view of its structure and functions (Alexopoulos, Stamou, & Papadopoulou, 2022; Gilles & Buck, 2019; Richards et al, 1985). It can be just a word expressing semantic meaning, for instance, street signs, yet the text does not include the rules of interpretation that enables us to perceive the message accurately. A text itself fails to provide a context as it is solely a linguistic expression, "the message presented in visual or auditory symbols". A text has a cohesive power that bounds the sentences together and connects the prior and preceding elements of the discourse. However, cohesion might not be the only factor that forms a text Beaugrande and Dressler (1981) argue that apart from cohesion textuality is determined by some factors depending on participants, their intentions and the setting of occurrence as it also emphasizes intentionality, acceptability, informality, situationality and intertextuality. These external aspects are predominantly realized in a discourse rather than a text, while internal aspects such as coherence and cohesion are perceived as an abstract realization of a discourse standing for the wider and complex concept (Dijk: 1977).

Another view of understanding discourse is related to Conversational Analysis and it mostly refers to dialogues, having any communication acts that includes turn-taking, topic changing, the rules for opening and closing the conversations can be qualified as discourse. Conversational analysis provides a foundation for discourse analysis as understanding of structures and processes of conversation empowers understanding of language in general (Riggenbach, 1999: 55). In addition to this, the role of conversation analysis requires observing the participants taking part in the conversation along with the conversational norms and patterns emerge as an interaction unfolds (Burns, 1996: 18). To the contrary, many researchers tend to look at the text as referring to monologues (Bulut & Kirbas, 2022; Crystal

& Davy, 1969), they even differentiate the terms regarding the mode, discourse is spoken and text is written. Some scholars discuss spoken and written discourse rather than spoken and written text. In addition to this, text is normally restricted to written language and the term discourse is restricted to spoken language.

Another approaches to discourse can be divided into formalist and structuralist schools. The former stands for "language above the clause" and the latter for "language above the sentence" (Stubbs, 1983: 1). Formalist way refers to Text Linguistics that deals with the structure of the text disregarding the context while Discourse Analysis views a language as a social phenomenon. Schiffrin (1994: 363) uses both approaches in her analysis of texts as they represent two different types of information that contribute to the communicative content and of an utterance.

In this work discourse is qualified as a language in use and it requires paying attention to both language itself as well as the action and participants of communication themselves. Discourse refers to "what is happening, to the nature of the social action that is taking place: what is that participants are engaged in, in which the language figures as some essential component?" (Halliday and Hasan, 1985: 12). Gee (2001: 28) considers several additional aspects of discourse including cognitive processing, body language, symbol system and other ways of interaction.

Besides the text discourse comprises with the use of context – the circumstances in which communicative goals are achieved and the rules of interpretation are used by the doers. In that sense discourse might not require the text at all. That can be the reason why the text is only an integral part of discourse and not discourse itself. Thus, discourse denotes an overall organization of a communicative activity including a text, a specific context and tenors.

Discourse Analysis and Pragmatics

Discourse Analysis (DA) denotes an analytical framework that examines actual text including paragraph structure, the organization of a text as whole, typical grammatical patterns occurring in conversational interaction along with the communicative context, i.e. how texts work within social cultural practice (Fairclough, 1989: 7). The definition of DA supporting

the functional perspective could more likely be the following: "the study of discourse is the study of any aspect of language use (Fasold, 1990: 65).

Discourse analysis particularly refers to language in use and "it is not restricted to the description of linguistic forms independent of the purposes or functions which these forms are designed to serve in human affairs (Brown & Yule, 1983: 1). Consequently, discourse studies is not purely sequential or syntactic, but predominantly semantic and pragmatic. Wetherell suggested four approaches to DA, namely: 1) DA is a multi-modal that aims to examine language as a system through finding patterns; 2) The focus of DA is on language in use, i.e. the process of interaction rather than a product; 3) It searches for language patterns related to the particular topic/discourse, for instance, academic discourse or political discourse; 4) It studies patterns within broader contexts such as "culture". Noticeably, the interest of discourse Analysis goes beyond a language and it is linked to variety of social activities/disciplines.

Discourse Analysis also refers to the production and interpretation phases of discourse, how speakers use language in order to express their intentions and how addressee interprets the received message. In consequence, Pragmatics is an interdisciplinary source for DA which shares a common ground with it but differs in method and scope as the latter is a general term for different techniques and approaches. Pragmatics is interested in the analysis of meaning in its broader sense (i.e. pragmatic meaning) rather than a traditional, truth-conditional Semantics (semantic meaning). Pragmatic research as discourse analytical work is related to a functional perspective on language, however, at the same time it considers the formal features as they contribute to the meaning of a particular utterance. Pragmatics is mainly focused on the study of mechanisms that enable speakers to determine indirect and implied meaning of/beyond utterances or a text, i.e. it allows the participants to properly encode and decode undetermined utterances. Grice (1975) defines pragmatic meaning as meaning-nn (non-natural meaning) and distinguishes it from semantic, literal meaning (so called natural meaning). Semantics studies what X means, while pragmatic examines what a speaker means by X.

According to European Continental School that could be identified as macro-pragmatic, Pragmatics can be defined as "the cognitive, social, and cultural science of language and communication", while micro-pragmatic the Anglo-American school is primarily interested

in the specific language features expressing pragmatic meaning such as an implicature, reference or deixis and other lexical or grammatical devices. Overall, Pragmatics can be defined as "the study of communicative action in all contexts" (Alba-Juez and Mackenzie, 2016), therefore, the scope of Pragmatics goes beyond the focus of Linguistics. Pragmatics provides Discourse Analysis with appropriate tools and mechanisms to carry out the work DA deals with. Furthermore, Pragmatics is very much linked to Semantics in its broader sense as it conveys the non-truth-conditional meaning of utterance/text. The two notions are vital for pragmatic studies context that is dynamic and personal and intentions of speakers, whereas in DA context refers to something more static and external. Context in Pragmatics refers to a source of information that assists a hearer to recognize the wishes and intentions of a speaker, moreover, it signifies how a hearer interprets a received message. Therefore, context guides the understanding of the utterance in an interaction. Another factor contributing to pragmatic meaning of an utterance could be defined as a physical location (e.g. the use of deixis). The collaboration of the two fields, namely Discourse Pragmatics, concentrates on the investigation of speech acts, how it's performed by the language users and how it's performed in a text.

Metadiscourse

The term "metadiscourse" was originally identified by Harris (1959) defined as "talk about the main material" or "a statement about discourse to the discourse itself", "language about language". Therefore, we could define metadiscourse as "discourse about discourse or communication about communication" (Kopple, 1985) or in the same way, "writing about writing", "and text about text" (Adel, 2006: 2). In the sense, "metadiscourse embodies the idea that communication is more than just the exchange of information, goods or services, but also involves personalities, attitudes and assumptions of those who are communicating" (Hyland, 2005: 3). Metadiscoursal level of text does not refer to propositional content of a text, i.e. it's non-propositional, non-truth conditional, however, it represents an expansion of the propositional level and helps us receive, organize, interpret, evaluate and react accordingly to a text. "Metadiscourse is a linguistic material in texts, written or spoken, which does not add anything to the propositional content but that is intended to help the listener or reader organize, interpret, evaluate the information given" (Crismore et al, 1993). In the absence of metadiscoursal meaning text can be easily misunderstood and "falsified" as "propositional material is something that can be argued about, affirmed, denied, doubted,

insisted upon, qualified, tempered, regretted and so on" (Halliday, 1994). Subsequently, a single content might have different meanings in different situations as a meaning varies through re-textualisation. Thus, the "meaning of a text is not just the propositional material, it is the complete package" (Hyland, 2005: 22).

To study metadiscoursal functions of text further we first need to differentiate tree macro functions of language. Halliday (1994) believes that people communicate with messages that are integrated expressions of three different types of meaning: ideational, interpersonal and textual:

- The ideational function/metafunction: the use of language to form ideas and concepts, to express the content of the situation, i.e. it mostly refers to a propositional meaning content of a text, the meanings about how we represent experience in language.
- The interpersonal function: the use of language to interact, to represent, exchange, organize and encode experience (Halliday, 1994: 68). It refers to text as an exchange of moves between participants. Moreover, it allows writers/speakers to express their perspectives toward the propositional content and reading/listeners.
- The textual function: the use of language to organize the text itself, coherence and cohesion of what is said. "Textual metadiscourse is used to organize propositional information in ways that will be coherent for a particular audience and appropriate for a given context." (Hyland, 2005: 26).

Metadiscourse focuses our attention on interpersonal and textual levels of discourse. Text-managing function operates within the world of language, while an interpersonal function beyond language i.e. it operates at the plane of the world outside the language. Textual metadiscourse indicates how we construct and relate individual propositions so that they form a cohesive and coherent text and how these propositions are linked to each other so that the text makes sense. Researchers working on textual metadiscourse including Mauranen (2001) and Adel (2010) believe that metadiscourse solely refers to text organization and metatext or text reflexivity focus on text itself, its structure and purpose. Besides discoursal function, metadiscourse has an interactional nature that is used to provide the persuasive effects on the text. It also encourages the listeners to retrieve the text as the speaker intended to be understood. Halliday categorizes it as interpersonal language function along with ideational and textual general language functions. Interpersonal is "language as mediator of role,

including all that may be understood by the expression of our own personalities and personal feelings on the one hand and forms of interaction and social interplay with other participants in the communication situation on the other hand." (Halliday, 1985).

According to the latest studies, all metadiscourse categories are essentially proposed to be interpersonal as they take into consideration readers/listeners prior knowledge, textual experience and processing needs. Therefore, Thompson (2001) and Hyland (2005) suggested the terms interactive (textual) and interactional (interpersonal). Accordingly, there are two theoretical strands that classify metadiscourse functions and their realization through different linguistic features.

Interactive/ Textual Metadiscourse Markers

Textual model of metadiscourse is based on the notion of the reflexivity of the text, i.e. its capacity to reflect on itself. Interactive metadiscourse markers help speakers to correctly encode the text by organizing the information. They contribute to managing the discourse so that speakers can anticipate listener's prior knowledge of a subject matter and reflect speaker's assumptions of what needs to be made explicit to give listeners proper directions how to recover this meaning from a text, "to guide listeners through the text and to comment on the use of language in the text" (Adel, 2006: 20). For Halliday, the textual function is mainly realized by discourse markers and by linguistic choices a speaker makes. The functions are realized by transition markers, frame markers, endophoric markers, evidentials and code glosses:

Transition markers: This category includes devices such as adverbials and adverbial phrases that are mainly used as additives, contrastive markers and consequentials in the discourse. Transitions enables listeners to indicate the different types of logical connection between clauses or sentences and helps them properly interpret links between ideas. Transitions are used to show the following connections between the clauses or sentences: addition, comparison and consequence.

Frame markers are an umbrella term for linguistic devices that organize texts for listeners and signal text boundaries of schematic text structure (Hyland, 2005). This category includes references used to sequence and label text stages and to demonstrate topic changes and shifts.

According to their functions, frame markers can be divided into several subcategories: to sequence, to label stages, to announce goals, to shift topics.

Endophoric markers are devices that refer to other parts of the text to make additional information available for listeners through providing supporting arguments. These markers lead the listener toward a preferred interpretation of a message in order to recover the speaker's intentions.

Evidentials indicate an idea from another source which originates outside the current text (Hyland, 2005). Evidential markers typically take the form of citations and academic attributions in academic discourse and are used to guide listeners' interpretation.

Code glosses mainly signal the restatement of ideas to give additional information through rephrasing or elaborating on what has been said in the text previously. These devices are used to enable the listener to recover the speaker's intended meaning.

Table 1. Interactive Model of Metadiscourse (Hyland, 2005: 49)

Category	Function	Examples
Transitions	Express semantic relation between main clauses	In addition, thus, and, furthermore, by the way, similarly, likewise, in the same way, but, on the other hand, by contrast, however, on the contrary
Frame markers	Refer to discourse acts, sequences, or text stages	First, next, then, for instance, listing, in sum, in short, by of introduction, focus, I want to, I argue that, my purpose is, Ok, well, move on, right,
Endophoric markers	Refer to information in other parts of the text	finally, in conclusion, to conclude
Evidentials	Refer to source of information outside of the text	As noted above, as I mentioned before, see chapter 2, In section 2, in this section
Code glosses	Help readers grasp meanings of ideational material by rephrasing or explaining what has been said	According to X, X states, as stated by X, mentioned by X Namely, such as, e.g., in other words, for example, known as, say, that is

Interactional Methadiscourse Markers

Interactional metadiscourse concentrates on the participants of the interaction and aims to express the author's persona by their intervention in providing explanations, clarifications related to their messages. It mainly shows the ways the author comments on the information provided in a text. It permits the author to establish a suitable relation to their text and audience, to mark the level of personality and intimacy into interaction as intended. Hyland names interactional metadiscourse as "author's demeanor of a printed "voice" as it "reveals the extent to which the author works to jointly build the text with readers" (Hyland, 2005). He classifies interactional markers into two main subcategories showing different functions: Stance features and Engagement markers.

Stance Features unites the following markers: Hedges are utterances used by speakers to display their perspectives toward their message and "to mark the speaker's reluctance to present prepositional information categorically" (Hyland, 2010: 129). By the use of hedges, speakers state their opinions and give their personal explanations rather than providing facts from certain knowledge:

a) Shield as a subcategory of hedges indicate the degree of speaker's confidence presented within all modal verbs or adverbs expressing possibility or probability;
b) approximates are expressions including like, around giving alternative, approximate meaning to a proposition/information provided in a text;
c) expressions such as "I believe", "I assume" outline speaker's doubts regarding a message.

Boosters are devices, primarily, emphatic and amplifying adverbs and modal verbs, expressing speaker's level of certainty and sureness in what they said (Hyland, 2005). The use of boosters strengthens speaker's arguments in presenting information. Attitude markers signal speaker's appraisal of propositional information showing obligation, surprise, force, approval, importance, etc.

They are mostly presented within attitudinal adverbs or adjectives, deontic modal verbs and cognitive verbs. Self-mentions are devices such as first person pronouns and the possessive adjectives and mark the explicit speaker's presence in an interaction. They aim to convey interpersonal information (Hyland, 2001).

Table 2. Interactional Metadiscourse Markers, Stance Features, Self-designed

Subcategory	Examples
Hedges:	
Shield	Probably, perhaps, possible, might, etc.
Approximates	About, around, somehow, some, kind of, sort of, etc.
Expressions	
Boosters	I believe, to our knowledge, I assume, etc.
Attitude markers	In fact, definitely, it is clear that, obviously, etc.
Self-mentions	Unfortunately, I agree, Surprisingly, etc.
	I, we, my, me, our, etc.

Engagement Markers: Reader pronouns permit speakers/writers to expressly address listeners/readers and to include them in the discussion by use of second person pronouns. Reader pronouns are "markers that lead readers into a discourse" (Hyland, 2010). Directives are imperatives that can be defined "as utterances which instruct the reader to perform an action or to see things in a way determined by the writer" (Hyland, 2002: 216).

Directives primarily convey an illocutionary force of suggesting, permitting, commanding and prohibiting, or requesting by the speaker, i.e. they require from addressee to do or not to do something, encourage them to pursue speaker's directions. Personal aside is a reader/listener-oriented strategy that "allows writers/speakers directly by briefly interrupting the argument to offer a comment on what has been said" (Hyland 2005: 183).

It enables speakers to comment or discuss something that might not directly related to the main subject being debated by interrupting or digression of the main topic. It refers to topic shifts or returning to the main topic discussed by the participants. Appeals to shared knowledge refers to "the presence of explicit markers where readers are asked to recognize something as familiar or accepted" (Hyland, 2005: 184).

It refers to the "shared knowledge" or "common ground" between the participants of the discussion. Questions encourage listeners to participate in the discussion in order to anticipate their readiness and understanding of the discourse. As stated by Hyland (2002: 529) they allow speakers/writers "to invoke explicitly the involvement of their listeners/readers in the discourse, addressing the perception, interests, and needs of a potential audience".

Table 3. Interactional Metadiscourse Markers, Engagement Markers, Self-designed

Subcategory	Function	Examples
Reader pronouns	To address listeners, include them into discussion	you, your, we, our, ours, let us, etc.
Directives	To instruct listeners what to do or not to do	Note that, consider, see, have to, must, should, It is good to look at, etc.
Personal aside	To interrupting the argument in order to make a comment	Well, yes, I see, but, so, etc.
Appeals to shared knowledge	To recognize something as familiar or accepted	Of course, we all know that, etc.
Questions	To ask the readers some questions to encourage their involvement in the discourse	Interrogatives

To summarize, according to the model proposed by Hyland (2005) both interactive and interactional metadiscourse functions refer to an organization of a discourse, however, the latter is also in charge of expressing evaluation, speaker's attitudes toward a text as well as participants of the interaction. Metadiscoursal functions in general are non-propositional, i.e. they don't add anything to the prepositional meaning, truth- condition of utterances, and they solely intend to help participants to organize, interpret and evaluate a text, since a language is not only used to convey information but also to establish social interactions (Schiffrin, 1980: 231).

Method

As noted, this study uses Hyland (2005) metadiscourse framework in order to analyze Georgian and English commencement speeches. Focusing on medatiscourse markers, the author uses a descriptive qualitative research that includes a) collecting the data and gathering the information; b) identifying and analyzing metadiscourse markers in the data; c) presenting the results of the analysis in the form of words in an empirical part of the study.

The data for the study is collected by the researcher through observing Georgian and English commencement speech online. Data is given in the form of video recordings, one of them assisted with subtitles in English. The researcher watches the videos on youtube and reads transcripts carefully in order to find out the potential data containing metadiscourse markers

in order to examine them further. After collecting the data, in order to provide a thorough analysis the researcher takes the following steps: 1) the data is classified in two categories: interactive and interactional metadiscourse markers; 2) examining the functions of collected metadiscourse markers used in given speeches; 3) classifying metadiscourse markers into subcategories according to the interactive and interactional models of metadiscourse proposed by Hyland; 4) Comparing the functions of metadiscourse markers in Georgian and English speeches.

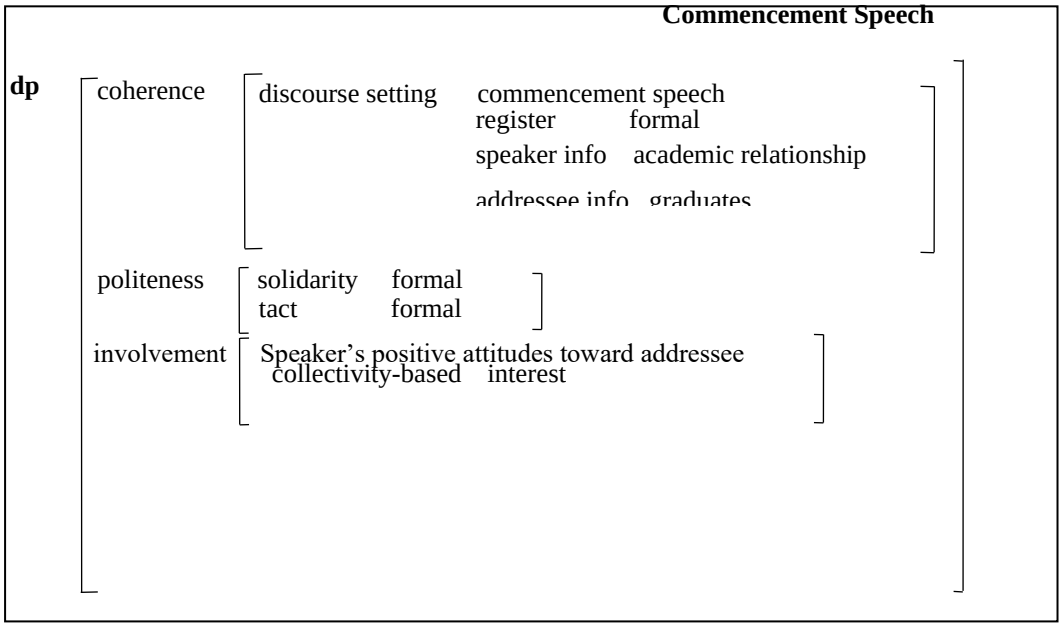
Results

Commencement speech belongs to the genre of commencement rhetoric and covers the following topics:
(a) acknowledging the graduates and their achievements;
(b) creating identification between the speaker and the graduates;
(c) presenting the world and its challenges; (d) installing a sense of hope for the graduates' future (Gault, 2008: 44).

Literature review reveals three main aspects of commencement speech:
(1) commencement address: formal talk given to an audience (Bull, 2011:426); graduation is a formal occasion and 'overly chatty' language should be avoided by the speaker. 'Talk' represents text, text in context and non-verbal language ('body language');
(2) commencement addresser –the speaker who interacts with
(3) commencement addressees – the audience. Commencement address is a planned academic speech that is initially given in a written form later delivered in front of the audience. It is clear that the genre is highly academic, but there are certain preferential and inherent linguistic features frequently presented in complex constructional structure. Therefore, I used a constructional grammar approach (Fried, 2015) in order to vividly show syntagmatic lexical surrounding.

To illustrate the commencement speech as a genre I used the frame representation designed by Östman (2015). A discourse frame in the Diagram 1 includes reference to a relatively rich discourse pattern (dp) that specifies discourse conditions I recognized in commencement speech such as the type of discourse (genre), discourse coherence and setting, the relationship between speaker and the audience as well as the speaker's subjective perspective.

Diagram 1. Frame Representation of the Commencement Speech

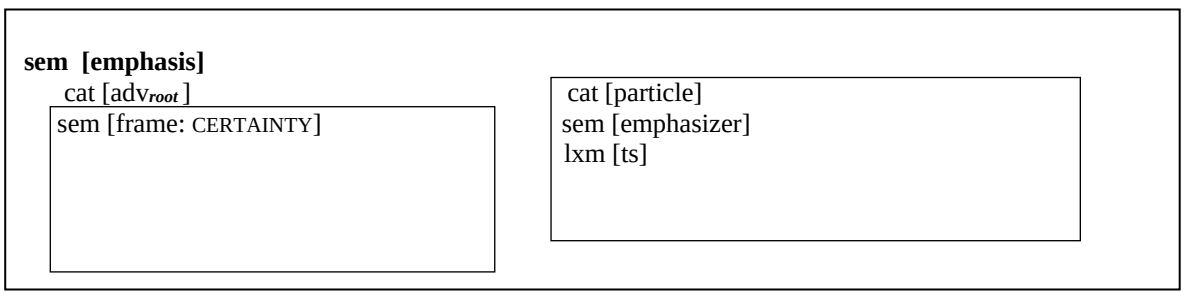


In this section I intend to adequately articulate three constructions informally described in section 5. The choice of examples was motivated by the use of an emphasizer "ts" in different lexical expressions. Therefore, I aim: 1) to provide the morphological image of fixed and semi-fixed expressions including "ts" used as metadiscourse markers in the discourse; 2) to provide the construction of the restrictive relative clause to identify the metadiscourse marker with"ts" and distinguish from a nonrestrictive relative clause. (1) I aim to explain how an emphasizer "ts" functions in the semi-fixed expression such as 'today is a truly interesting day':

(1)	დღეს	მართლაც	საინტერესო	დღეა
	dγes	*martla-ts*	*saintereso*	*dγe-a*
	today	really-REL	interesting	day-COP

'Today is a truly interesting day.'

Diagram 2. Morphological Representation of an Emphatic Structure



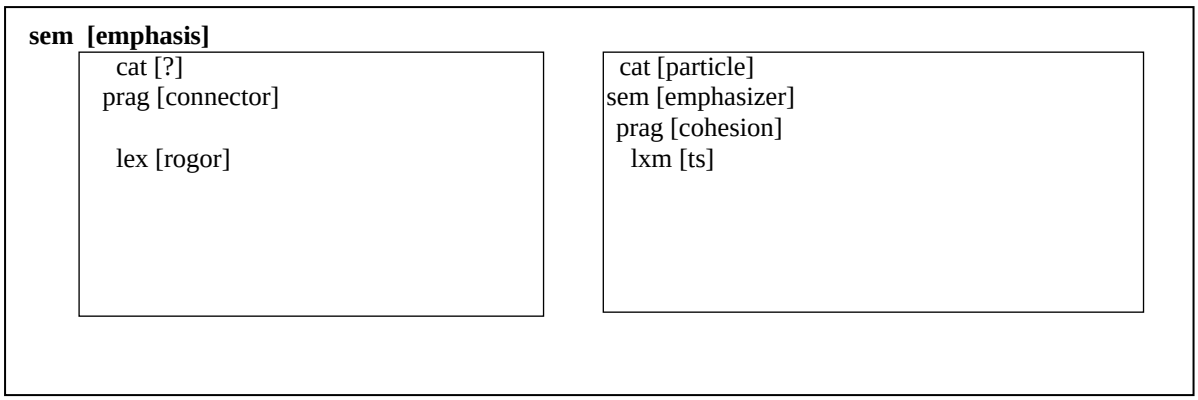
In the above mentioned example “ts” represents a relative particle which along with an adverb ‘really’ provides the further information for the predicate of the sentence ‘dɣea’. In this utterance the use of “ts” is optional and does not affect the truth condition or overall content of the sentence, it is used as a relative particle that primarily functions as an emphasizer in order to imply further pragmatic meaning, namely expressing the importance of the day and showing the speaker’s attitude toward the proposition.

The lexis “martla-ts” equals the following adverbs of certainty: truly, definitely, clearly, etc. Different from the formal speeches, in spoken academic discourse this utterance might appear with additional “that” (rom) in the form “dɣes martlats rom saintereso dɣea” that can be perceived as a further assurance from the speaker about the significance the day holds.

The following example discusses the function of the emphasizer “ts” in fixed expressions (2):

(2)	*როგორც*	*ყველას*	*მოგეხსენებათ*
	Rogor-ts	*q’vela-s*	*mo-g-e-xsen-eb-a-t*
	as-REL	all-DAT	PREV-2IOBJ-APPL-inform-them-3SG.SNJ-PL
	‘As you all are informed.’		

Diagram 3. Morphological Representation of an Emphatic Structure

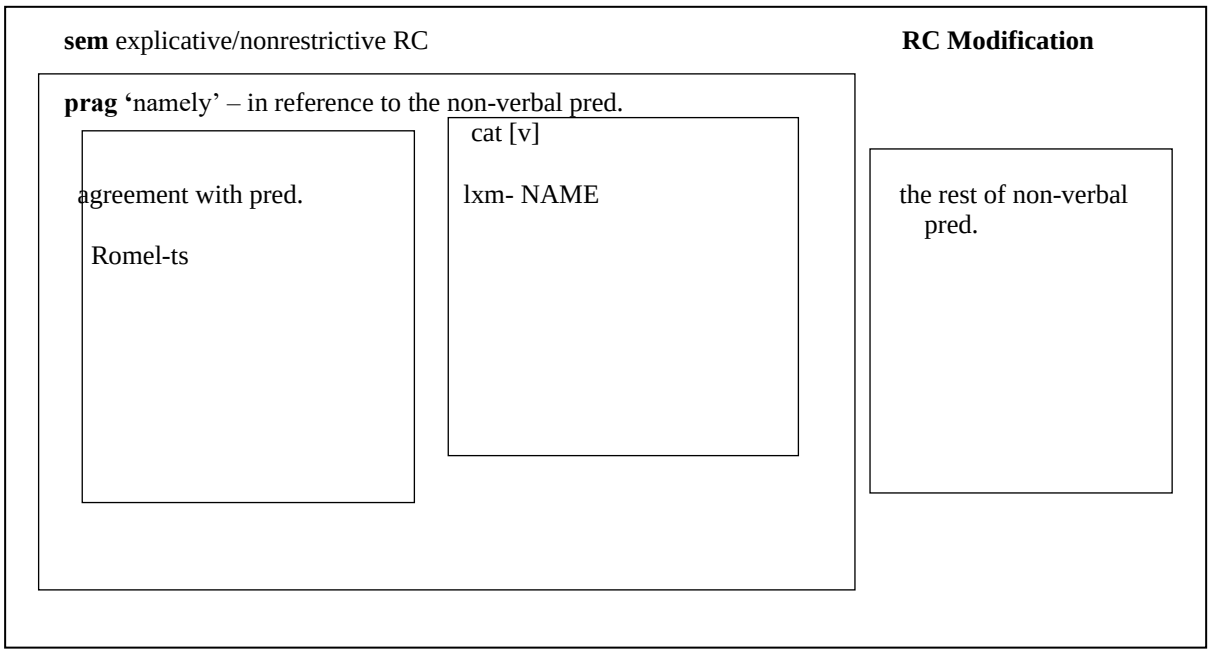


In this example “ts” is a grammatical cohesive device that can’t be omitted as it is in agreement with the predicate of the clause and contributes to the semantic meaning of the expression. The lexis “rogor” itself obtains an absolutely different semantic meaning that does makes sense on its own. Therefore, “ts” appears to have polysemous meaning, it might function as a relative particle either connector in a clause.

I intended to explain the functions of emphasizer “ts” in non-restrictive relative clause:

(3)	*რომელსაც*	*ჰქვია*	*ევროპული*	*ოჯახი*
	romel-sa-ts	*h-kv-i-a*	*evropul-i*	*odzakh-i.*
	that-NOM-REL	3OJB-name-SM-3SBJ	European-NOM	family-NOM
	Namely, European family.			

Diagram 4. Informal Syntactic Representation of Non-restrictive Relative Clause



In this example “ts” as an inseparable unit of the fixed lexical expression functions as an emphatic marker that contributes to the pragmatic meaning of the utterance, aims to strengthen the importance of the family mentioned by the speaker. Moreover, at the same time it implies a grammatical function showing the agreement between the relative pronoun and the predicate of the sentence. Etymologically another particle, namely “tsa” was used as a cohesive device marking the agreement between predicate and adverb of the sentence (Shanidze, 1980:609). However, due to the elision of vowel ‘a’ “ts” replaced a particle “tsa” and gained the polysemous meaning. Overall, “ts” in this relative clause functions on pragmatic and grammatical layers of the language and is obligatory to use.

Non-restrictive also known as a non-defining relative clause (3) is a relative clause that adds nonessential information to the proposition and it does not restricts the noun “family”. This

sentence represents a good example of the relative clause used as a pragmatic/metadiscoursal marker, a code gloss, clarifying the importance of a particular family the speaker refers to.

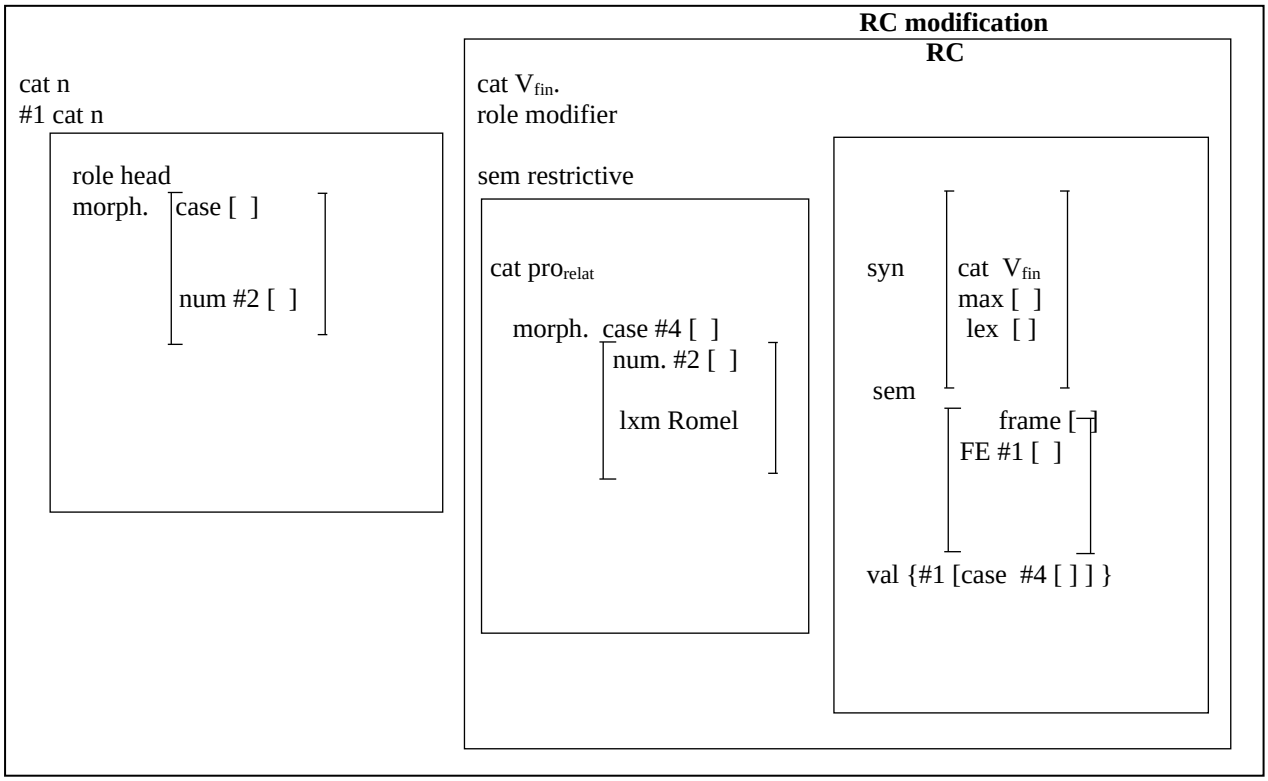
Besides an emphasizer “ts” pragmatic meaning is realized by the use of predicate “hkvia” itself (“name” as a verb), which along with “ts” creates a strong emphatic meaning and expresses the speaker’s positive attitude towards the proposition. The fixed lexical expression “romeltsats hkvia” (namely) is highly academic, therefore, it is a genre specific, i.e. commonly used in formal speeches including commencement speeches. The following example (4) is a common restrictive relative clause occurring in colloquial Georgian, which defines a noun and limits its meaning “family that is a European family”. In this sentence similar to the previous one (3) “ts” (originally “tsa”) is used as a relative particle in agreement with a predicate of the sentence “aris” explained below:

(4)

რომელიც	*არ-ი-ს*	*ევროპული*	*ოჯახი*
romel-i-ts	*ar-i-s*	*evropul-i*	*odzakh-i.*
that-NOM-REL	COP-STAT-3SBJ	European-NOM	family-NOM

‘That is a European family’.

Diagram 5. Constructional Representation of a Restrictive Relative Clause



The study shows a frequent use of "reader pronouns" as a subgroup of engagement markers, mostly the 1st person singular and plural (possessive) pronouns as well as the 2nd person plural pronoun:

(5)

მოგესალმებით,	მივესალმები	ჩვენს	სტუდენტებსა	და	კურსდამ-ებს
mogesalmebit	mivesalmebi	chvens	studentebs	da	kursdamtavrebulebs

Hello to **you**, hello to **our** students and graduates…

In Georgian language similar to most of languages 'chven' (we) is an inclusive pronoun, i.e. it includes for the speaker, the audience attending the events along with all graduates outside of the setting of the event. The same inclusiveness applies to the 1st person plural possessive pronoun 'chveni' (our) (6):

(6)

წარმატებული	*ყოფილიყავით*	***თქვენი***	*მომავალი*	***ჩვენი***	*ქვეყნის*	*მომავალია*
tsarmatebuli	*q'opiliq'avit*	***tkveni***	*momavali*	***chveni***	*kveq'nis*	*momavalia*

***I** wish you all success, your future is the future of **our** country.*

The use of personal pronouns enables the speaker to address the audience properly and to involve them to the discussion in order to establish a positive rapport and the sense of togetherness between the sides of communication.

The use of deixis/ deictic devices in commencement speech as textual markers

Deixis/ Deictic references can always be found in oral communication including academic speech to primarily indicate a condition of persona, time and space. It is a technical term for expressions only known from the context of the speech. Each speech act is conceptualized from different perspectives, therefore, the same deixis (such as here, there) refer to different entities when used in different occasions.

There are certain types of deixis used in the genre of commencement speech, including deixis of time ('now', 'today') that is concerned with the encoding of temporal points of an event, the time/ the day at which the speaker is producing an utterance in front of the audience (7a,b):

(7)

a) This is a hall, which witnessed so much over so many years...Today though it's empty.

b) It's now my pleasure and privilege by virtue of my authority…

Deixis of place ('here') serves to show the location of a commencement ceremony in particular (8):

(8) I am here in the great hall of the university.

At last, deixis of situation delivering the situational/ contextual meaning defined by the speech event and participants producing utterances (9):

(9) Welcome to this our virtual graduation ceremony.

Here a demonstrative pronoun 'this' refers to the restricted format of the graduation ceremony due to the pandemic situation in the world.

Frame Markers

The main difference between transitions and frame markers lies in their functional uses. Transitions express semantic relations between preceding and proceeding discourse segments whereas frame markers contribute to organization of discourse, sequencing or staging a text, announcing goals and topic shifts. So (10) is an inferential discourse marker that is syntactically and semantically optional in the sentence, i.e. it does not change a propositional meaning of the discourse segments. Spoken discourse can sometimes be chaotic without using discourse markers as the speakers frequently shift from one topic to another. Accordingly, So is used as a connectors to stay on the track of the main idea or as a focus marker. Frame markers are usually followed by a pause in order to capture people's attention.

(10)

So, in saluting your achievements in wishing you every success.

Endophoric markers

Endophoric marker or reference is a general term that refers to something mentioned in the

text earlier (anaphoric reference) or later (cataphoric reference). Besides that, there is an exophoric reference that refers to something outside of a text/discourse that comes from the shared knowledge among speaker and audience.

Anaphoric and Exophoric markers are common in Georgian commencement speeches. They are presented in the form of fixed or semi-fixed lexical expressions or collocations that contribute to linking discourse segments and ideas and organizing overall discourse, i.e they are structural units. Moreover, by the use of highlighted markers the author refers to the audience and makes them involved in the talk.

(11a)

როგორც	***ჩვენ***	***უკვე***	***ერთხელ***	***ვთქვით***	***და***
Rogor-ts	*chven*	*ukve*	*ertkhel*	*v-tkv-i-t*	*da*
as-REL	1PL	already	once	1SBJ-say-AOR-PL	And

აღვნიშნეთ

agh-v-nishn-e-t

PREV-1SBJ- note-AOR-PL

'As we already once said and noted'

As we have already said and noted, Tbilisi State University has got its development strategy that is very interesting.

(11b)

კიდევ ერთხელ ვიმეორებ, რომ უნივერსიტეტის კარი ყოველთვის ღიაა ნებისმიერი კურსდამთავრებულისათვის.

კიდევ	*ერთხელ*	*ვიმეორებ*
kidev	*ertkhel*	*v-i-meor-eb*
Again	once	1SBJ-APPL-repeat-TM

'I repeat once again'

The first two sentences (11a,b) anaphoric markers are referring to something mentioned by the speaker earlier in the speech (inner reference), whereas the third sentence (3c) includes an exophoric marker referring to the meaning outside of the text (outer reference):

(11c)

როგორც ყველას მოგეხსენებათ, 300 000-ზე მეტი ადამიანი ...

rogor-ts *q'vela-s* *mo-g-e-xsen-eb-a-t*

as-REL all-DAT PREV-2IOBJ-APPL-inform-them-3SG.SBJ-PL

'As you all are informed', over 300 000 people

In addition to discourse organizing function, these markers (11a,c) play a part in establishing a good rapport between the speaker and the listeners as they also present a referral to the audience. The markers are presented by semi fixed lexical expressions as they can easily be modified according to the communicative needs and the register.

Two of them (11a,c) are supposed to be more formal conveyed by plural first-person pronouns and high formal verbs/verb phrases "noted, being informed".

Moreover, the level of formality is achieved by the use of impersonal passive "as you all are informed" (11c). Another point worthwhile to notice about the final example is a usage of the quantifier "all" in Georgian "As you all are informed", that spotlights the importance and familiarity of the discussed topic by the audience.

Interactional Metadiscourse Markers

Stance Features or stance-taking can be briefly explained as speaker's assessment of an object or proposition, i.e. expression of author's attitude or relation to the object. Stance-taking is viewed as a social action shared between the speaker and the audience as it involves inviting listeners in the evaluation and ask them to take their own stance.

One of the subcategories of stance features are hedges that mark uncertainty in language. It is used when a speaker is not sure about the information they provide. In shield (12a) we suppose that the speaker is hedged, in that their degree of commitment to a proposition is stated. Georgian word "albat" denotes suspicion, lack of certainty.

It is an adverb that is phonologically separated with comma intonations from the other words in the sentence. The marker can be found in the initial or mid position of the sentence:

(12a)

ხარისხიანი განათლება, ეს არის, ალბათ, ყველაზე მთავარი.

khariskhiani ganatleba, es aris, albat, q'velaze mtavari.

Quality education, this is, **probably,** the most important thing.

The second type of hedges are approximants that operate on the propositional content and contribute to the interpretation by indicating some markerdness. They are divided into two subclasses adaptors and rounders. Adaptors (12b) relate to the class membership. They are primarily used when the speaker is not entirely sure about the proposition even though the proposition is almost right. In the broader range of pragmatic functions, approximants "kind of, sort of, somewhat, etc" could be used as fillers or hesitation markers in both languages:

(12b)

You can help to reshape the world that needs the kind of skills, the kind of abilities, the kind of commitment, which characterize students of Birmingham University. The last type of hedges are lexical expressions indicating the speaker's uncertainty and doubt about the proposition (12c). English equivalent of "Imedi aris" - "hope is" or "there is a hope" would be an adverb "hopefully" that is not unusual in Georgian. However, "Imedi aris" is a less common form as well, instead Georgian speakers would use "imedia" or "imedi makvs".

Georgian is a synthetic language, i.e. in Georgian syntactic relations in the sentence is expressed by inflection "Imedi – a" where the suffix "a" replaces/takes a role of the verb "have" and indicates an existence of a hope. The latter form "imedi makvs" can be translated as "I have a hope" that implies the function of a hedge along with the functions of an attitude marker expressing the speaker's expectations to the proposition.

(12c)

იმედი არის, იმედი გვაქვს, სექტემბერში აღდგება ტრადიციული სწავლება

Imedi aris, imedi gvakvs, sektembershi aghdgeba traditsiuli stavleba

There is hope, **we hope** that we continue a traditional way of schooling in September.

Attitude markers are words or phrases which assist speakers to convey their perspectives, evaluation, feeling, and attitude towards the proposition. Sentence adverbs "It is very unfortunate" or "unfortunately" directly addresses to the listeners and includes them into the discussion along with addressing the speaker's involvement in a text. In academic discourse personal pronouns "I", "we" can be replaced with impersonal attitude markers as given in an example (13a) instead of "I am sorry" or "I am concerned". In terms of the register, "Dzalian samtsukharoa" is a neutral phrase. It can be used in a wide range of context including giving condolences as it has a strengthening effect on the proposition. In the same way, by the use of attitude marker "rats saamakoa" (13b) the speaker applies to clarify his feelings and views contained in the utterance being made.

(13a)

ძალიან	სამწუხაროა,	რომ	დღესაც	გვიწევს	პანდემიის	გამო...
Dzalian	samtsukharoa,	rom	dghesats	gvitsevs	pandemiis	gamo...

It is very unfortunate (Unfortunately), that due to the pandemics we had to…

(13b)

დიდია	ნაკადი	სტუდენტების,	**რაც**	**საამაყოა.**
Didia	nakadi	studentebis,	**rats**	**saamaq'oa.**

There is a huge flow of students (from foreign universities) **that is something to be proud of.**

Metadiscourse markers help the communication to be more than just exchange of information and involve the personalities, assumptions of those sides who are communicating. With the following attitude verbs (14a,b) "I am sure", " I know" the speaker expresses his personal feelings of certainty or confidence in a belief. Both markers occur in an initial position of the sentence to lead listeners to the speaker's intentions. "I am sure" and "I know" are characterized by orality and high frequency of use. "I am sure" is sometimes accompanied by the intensifiers such as "absolutely", "completely" in Georgian as well as in English, for instance, "I am absolutely sure" in Georgian could be translated word by word as "Absoluturad dartsmunebuli var"- "Absolutely sure I am".

(14a)

დარწმუნებული	**ვარ,**	ბევრი	კურსდამთავრებული...
Dartsmunebuli	**var,**	bevri	kursdamtavrebuli

I am sure, that many graduates…

(14b)

I know that many of you have been engaged in similar activities back home in your own communities.

Self-mentions are realized in first person singular and plural pronouns along with possessive adjectives. They reflect the degree of confidence and authority of the speaker. The speakers use personal pronouns for different purposes: to adopt a particular stance and disciplinary-situated authorial identity (Hyland, 2008: 8) as it's given in the example (15a) where first person singular pronoun and possessive function inclusively "I wish…our country", i.e. "our" refers to both the speaker and the audience and emphasizes personal involvement and responsibility of both sides in the future development of the county.

(15a)

წარმატებული ყოფილიყავით ***თქვენი*** *მომავალი* ***ჩვენი*** *ქვეყნის მომავალია*

tsarmatebuli q'opiliq'avit ***tkveni*** *momavali* ***chveni*** *kveq'nis momavalia*

I *wish you all success, your future is the future of* ***our*** *country.*

Furthermore, the use of such pronouns in English language displays the speaker's responsibility for the claims/predictions made (15b,c).

(15b)

In the university during this crisis we have been doing extraordinary things…we have played our part in the nation's response to the COVID crisis.

(15c)

…And together we will rebuild the world for a better future for us all.

Conclusion

It's clear that commencement speech represents a separate genre characterized with highly formal register. Even though the mode of communication is spoken, the text of the speech is planned in advance and, therefore, does not include the linguistic features of the spontaneous speech. Instead, it requires the use of certain types of certain (meta)discourse markers that

mostly organize the discourse structure (textual metadiscourse markers) and express different pragmatic meaning (engagement metadiscourse markers). The findings of the study revealed the high frequency of using endophoric markers such as As noted above, as I mentioned before; code glosses (namely); deixis of time (now) , place (here), situation (this) as well as interpersonal metadiscourse markers: stance features- boosters, attitude markers, self-mentions; engagement markers- reader's pronouns, directives, appeals to shared knowledge.

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Chapter 8 - The Effect of Celebrity Endorsements and Political Identity in Sustainability Advertising

Jung Hwa Choi, Tae Rang Choi

Chapter Highlights

- Celebrities are increasingly entering public discussions about climate change as advocates, experts and spokespeople.
- This study examines which kinds of celebrities are more effective at endorsing environmentally friendly behaviors, like purchasing green products.
- Specifically, we test how political ideology of the celebrity and environmental concern of the consumer interact to influence perceptions of the endorser, attitude toward the ad and purchase intent.
- To develop the experimental stimuli, a pretest was carried out to determine which celebrities, which product category, and which green claims should be included in the ad. In addition, to assess whether the celebrities framed in the advertisements were indeed perceived as intended, a manipulation check was conducted.
- We find that Democratic celebrities are deemed most effective at endorsing green products (i.e., higher fit for green products, higher celebrity trustworthiness, higher attitude toward the advertising, and higher purchase intention); this relationship is augmented among environmentally concerned consumers, for whom Republican endorsers are ineffective.
- Among those low in environmental concern, celebrity ideology has no impact.

Introduction

Over the past few decades, have celebrating the 50th anniversary of Earth Day in 2020 ahead, concern for the environment has been increasing continuously, and the environmental issues have become the important topic. According to a survey conducted by Pew Science Center (2016), 75 percent of the U.S. adults showed their concerns about the environment, and about 83 percent of them tried to live a daily life for protecting the environment. The growth of the attention to the environment has also appeared in the market. Nearly 80 percent of consumers in the United States indicated that individuals need to change their consumption habits in the ways of impacting the environment positively (Shelton Group, 2017). Further, to propel environmental change moving forward, consumers expressed the critical roles of a brand advocacy in sustainability issues, as well as the willingness to purchase a product from a brand cares the environment (Cone Communications, 2017).

With the rise of green consumerism, corporations are increasingly eager to distinguish themselves as environmentally responsible and their brands as green (Hartmann & Apaolaza-Ibanez, 2009, 2010; Iyer & Banerjee, 1993; McEachern, 2008). Green advertising – the inclusion of environmentally friendly features and attributes as a persuasive selling point – is increasingly commonplace. Past research indicates green advertising claims have grown over the last few decades (Gephart et al., 2011; Grillo et al., 2008), and along with it, interest from academics (for example, see Sheehan and Atkinson, 2012). For example, a growing body of work has looked at green advertising and the role of environmental concern, framing, regulatory focus and skepticism, to name just a few (Bickart and Ruth, 2012; Carlson, & Muehling, 2012; do Paço & Reis, 2012; Kareklas et al., 2012).

One area that remains unexplored, however, is the role of celebrity endorsements in green advertising messages. Celebrity endorsements are a staple of advertising campaigns across many types of products and services (Kaikati, 1987). This is increasingly the case with environmental issues, too. As Boykoff and Goodman (2009) note, we are witnessing a "celebritization of climate change" in which the media, politics and climate science are becoming intertwined and exerting influence over the cultural politics of climate change.

We take this as the starting point for our study, which seeks to understand the role of celebrity endorsements in promoting green consumption. But rather than focusing on the

simple presence/absence of a celebrity in a green advertising campaign, we echo Boykoff and Goodman's point that politics is inextricably linked to this process. As such, we seek to understand how celebrity endorsement and celebrity political ideology interact to foster green consumption.

Green Advertising and Green Consumption

Green advertising refers to "promotional messages that may appeal to the needs and desires of environmentally concerned consumers" (Zinkhan & Carlson, 1995). Trade and academic research indicates the number of green products is rising, and along with it, green advertising claims. For example, a report by Terra Choice showed that in 2010, the number of **"**greener**"** products jumped 73% compared to the previous year, which itself had seen a jump of 79% from 2008 (TerraChoice, 2011). A report by Ogilvy and Mather indicated about half of all Americans are receptive to environmentally friendly products and try to lead sustainable lives (Bennett and Williams, 2011).

From the perspective of climate change researchers, green consumption is heralded by many as a meaningful set of choices individuals can make to help mitigate the effects of climate change (Nisbet & Scheufele, 2009; Ockwell et al., 2009). Even government agencies have encouraged consumers to go green. For example, the U.S. Environmental Protection Agency recommends reducing electronic waste and also advises consumers to buy "green" products, i.e., products made with fewer toxic ingredients and products designed with environmental attributes and recycled materials (2001).

Advertising campaigns have responded by framing products and services as green. Framing theory with respect to mass communication refers to the way certain elements of a message are selected and highlighted at the expense of other elements of a message (Entman, 1993). A frame calls attention to some aspects of reality while obscuring others, providing a "central organizing idea or story line that provides meaning" (Gamson & Modigliani, 1987). Entman (1993) has identified several framing functions and has noted that frames serve to define problems, diagnose causes and suggest remedies.

Past research indicates several different kinds of frames have been employed in green advertising. For example, drawing on classic arguments about self-regulatory focus, Ku et al.

(2012) found that product-related green appeals resonate more with prevention-focused consumers. Looking at visual cues in green product claims, Atkinson and Rosenthal found that eco-seals with more detailed information cues were more persuasive than simple graphical images with less information. In keeping with this focus on different frames in green advertising appeals, the study outlined here analyzes the framing effects of celebrity endorsers and celebrity political ideology in green advertising campaigns.

Celebrity Endorsements in Green Advertising

Advertising has drawn on celebrities and endorsers since the late 19th century (Kaikati, 1987). Including celebrities helps generate positive evaluations of the ad and creates more positive attitudes toward the advertised brand, while making the advertising message more memorable, credible, and desirable (Miciak & Shanklin, 1994). The use of celebrities can not only generate increased sales and profits but can also influence consumers because of their symbolic and aspirational reference group association (Agrawal & Kamankura, 1995; H. Friedman & L. Friedman, 1979; Kamins & Gupta, 1994). Reference groups provide points of comparison through which the consumer may evaluate attitudes and behavior in association with products or services. People tend to view celebrities as a sort of guide to their consumption choice, role models, for buying products they represent. A typical consumer might aim to identify with this group by consuming products that celebrities endorse. Correspondingly, celebrity endorsements have enjoyed much resonance among academics and practitioners (Vaughn, 1980).

Those of the effects of celebrities have been transferred to other domains of societal issues. Previous research investigated role of celebrities, their ethics in particular, into global political and international diplomacy (Choi & Berger, 2010). In the realm of environmental issues, like climate change, celebrities are increasingly playing the role of advocate and expert (Anderson, 2013), becoming spokespeople for the issue (Boykoff & Goodman, 2009; Brockington, 2008; Lester, 2006). Celebrities, who enter our lives as “intimate strangers,” can help popularize and make real issues like climate change - that might otherwise be distant and remote – fell more real (Evans and Hesmondhalgh, 2005; Marshall, 1997; Schickel, 1985). It is no surprise then that celebrities represent potentially powerful message elements in environmental campaigns, including those promoting green products.

Yet celebrities are not uniformly effective with extant work suggesting some conditions are more favorable than others for celebrity endorsements. For example, the "product match-up hypothesis" indicates successful celebrity endorsements require a suitable fit between the product and the celebrity (Kamins,1990; Kamins & Gupta, 1994). McCracken's (1989) meaning transfer model proposes that celebrity endorsements work by transferring the celebrity's "meaning" to the product. Only if the consumer identifies with the meaning of the celebrity will the equity of the celebrity be transferred to the consumer via purchasing the product. In the realm of green consumption, political ideology might be an important celebrity quality that could affect the success of endorsements.

Political Ideology, Green Consumption and Celebrity Endorsements

As the public's understanding of humans' impact on the environment has grown, attitudes on how to address the problem have become divided. This divide is particularly notable in the context of political ideology, with Republicans/conservatives and Democrats/liberals talking often opposites stances on issues related to the environment, such as a renewable energy. According to the Pew Research Center (2015), only 10% of conservative Republicans think the Earth is warming due to human activity; by contrast, 78% of liberal Democrats hold this view. Similarly, Democrats tend to vote in favor of environmental concerns, while Republicans tend to favor energy concerns. Republicans show greater support allowing companies for offshore drilling, fracking and nuclear power. However, Democrats are predisposed to employ renewable resources such as solar and wind power over increasing fossil fuel production. In their study of political ideology and green consumption, Gromet, Kunreuther and Larrick (2013) demonstrated that conservatives were less likely to purchase a more expensive energy-efficient light bulb when it was labeled with an environmental message than when it was unlabeled.

Political ideology influences shaping a communal belief and value system through which people view and react to the world around them (Jost et al., 2009). As such, advertisements having endorsers, who support one side of political parties, can also have effects on individuals' viewpoints about a brand and a product. Endorsements have become increasingly intertwined in the past 15 years (Jackson & Darrow, 2005). In the United States, celebrities and other influencers can be found making political statements about issues, which influences the opinions and behaviors of the public (Wood & Herbst, 2007).

Previous research proposed that political advertisements impact on individual's decision-making (Rothschild, 1978), and entertainer endorsements are the most prevalent and strong impression factor (Wood & Herbst, 2007). However, it was demonstrated that different types of endorsers (Aggarwal-Gupta & Dang, 2009; Stafford et al., 2002) and the advertised context variables (Ohanian, 1991) provoke different effects. Therefore, we assume that endorsements will have different effect depending on the endorsers' representing political parties on green product advertisement since political parties standing on each position on environmental related issues.

Moderating Role of NEP

For decades, as environmental concern has become a predominant factor affecting consumers' perceptions of human-environment relationships, researchers have devoted attention to investigating related factors, such as pro-environmental behaviors, attitudes, beliefs, and values (Pelton et al., 1993; Kilbourne & Carlson, 2008; Best et al., 2013). One of the most popular measures of consumers' environmental concern or pro-environmental orientation is the New Environmental/Ecological Paradigm (NEP) scale. The NEP scale was introduced by Dunlap and Van Liere (1978) to gauge an individual's worldview of the relationship between humans and nature. Since attitude is considered a psychological factor, which is a predictor of one's behavior, the NEP scale has been re-conceptualized as a broad attitude measure at the individual level (Dunlap, 2008). That is, this scale is applied for evaluating individual's attitude toward environment. Even though the NEP scale has been modified, NEP scale covers peoples' consciousness or understanding of environmental/ecological issues at a societal level. Hence, the current research embraces both perspectives that NEP scale assesses the interactions between environment and human being with societal beliefs that might have influence on individuals' attitudes and behaviors toward particular environmental issues (Fernandez-Ballesteros, 2003; Stern et al., 1995).

The NEP has been widely used in previous research about environmental sustainability. In the past, it has been applied to public or environmental interest groups (Pierce et al., 1992; Albrecht et al., 1982). Many scholars have also used this scale to investigate the differences in pro-environmental orientations between nations, such as Canada, Sweden, the Baltic States, Turkey, Japan, Latin America, and Spain (Edgell & Nowell, 1989; Widegren, 1998;

Gooch, 1995; Furman, 1998; Pierce et al., 1987; Bechtel et al., 1999). In recent research, Lin and Chang (2012) suggest positive relationships among individuals' environmental consciousness and knowledge of and familiarity with green products by using the NEP scale. The NEP scale is even used in green building occupant study that investigates an association with occupancy of green buildings and individuals' environmental attitudes (Deuble & Dear., 2012).

Given the prior literature of political polarization, celebrity endorsement, and characteristics of NEP, the current study hypothesizes that the NEP might moderate the effects of celebrities' political party on green product advertisement. More specifically, because individuals with a higher level of NEP might have higher awareness of environmental issues, they are more inclined to try to solve environmental problems and are more willing to participate in those activities (Fernandez-Ballesteros, 2003). Consequentially, consumers with a higher NEP score are more likely to have positive responses toward Democratic-endorsed celebrities' green product advertisement rather than Republican-endorsed one since Democratic Party concerns the negative impact of human on the environment, the balance between human and environment, protection of environment from being harmed, and renewable energy. Thus, taken together, the following hypotheses are proposed:

H1: When exposed to green advertisements endorsed by Democratic celebrities, consumers will exhibit a higher level of (a) celebrity-product fit and (b) celebrity trustworthiness, while controlling for celebrity familiarity, phone involvement, and consumers' political ideology.

H2: Consumers with higher levels of NEP will exhibit higher levels of fit perception between green advertisements and Democratic celebrities than consumers with lower levels of NEP, while controlling for celebrity familiarity, phone involvement, and consumers' political ideology.

H3: Consumers with higher levels of NEP will exhibit higher levels of trustworthiness toward Democratic celebrity endorsers of green advertisements than consumers with lower levels of NEP, while controlling for celebrity familiarity, phone involvement, and consumers' political ideology.

H4: Consumers with higher levels of NEP will exhibit higher levels of attitude toward green advertisements endorsed by Democratic celebrities than consumers with lower levels of NEP, while controlling for celebrity familiarity, phone involvement, and consumers' political ideology.

H5: Consumers with higher levels of NEP will exhibit higher levels of purchase intention when exposed to green advertisements endorsed by Democratic celebrities than consumers with lower levels of NEP, while controlling for celebrity familiarity, phone involvement, and consumers' political ideology.

Method

Pretest

To develop the experimental stimuli, a pretest was carried out to determine which celebrities, which product category, and which green claims should be included in the ad. To select the celebrities, the authors identified four celebrities, two conservative (Tim Tebow and Carrie Underwood) and two liberal (Leonardo DiCaprio and Jennifer Lawrence). To verify that these four celebrities would be seen as realistic product endorsers, a pretest was carried out. Participants (n = 40) were drawn from Amazon Mechanical Turk and were presented with the names of the four celebrities and asked (a five-point Likert scale; 1 = definitely disagree, 5 = definitely agree) whether they thought "the celebrity would be a good choice for a company to hire as their celebrity endorser." Each celebrity scored over the midpoint of 2.5: Tim Tebow (M = 3.42, SD = 1.35), Carrie Underwood (M = 4.91, SD = .95), Leonardo DiCaprio *(*M = 3.9, SD = 1.35), and Jennifer Lawrence (M = 4.05, SD = 1.34).

A second pretest was conducted to determine which product category should be chosen. In exchange for extra credit, 185 undergraduate students participated in the study. Students indicated their agreement (a seven-point Likert scale; 1 = strongly disagree, 7 = strongly agree) with five items (e.g., Product category X "is very important to me.") to gauge the relevance of each potential product category (sports drinks, head phones, cell phones, cars, and jeans). Cell phones were the most relevant (M = 5.84, SD = 1.15) compared to sports drinks (M = 3.88, SD = 1.58), head phones (M = 4.71, SD = 1.56), cars (M = 3.73, SD = 1.54) and jeans (M = 3.49, SD = 1.75).

A third pretest was carried to determine which fictitious brand name was most believable, and which green product claims were most important. Participants (n=30) were drawn from Amazon Mechanical Turk and asked how important 10 green product attributes were when considering cell phones (a six-point Likert scale; 1=not at all important, 6=extremely important). The top five attributes were chosen: energy efficient for the user (M=4.9,

SD=1.19), is not made with any dangerous chemicals, like arsenic (*M*=4.63, SD=1.47), is not made from scarce resources, like rare earth elements (*M*=4.43, SD=1.43), can be recycled (*M*=4.4, SD=1.45), and is made from recycled materials (*M*=3.93, SD=1.72). The participants were also asked to rate their impressions (a six-point semantic differential scale not likeable/likeable, unbelievable/believable, not authentic/authentic, not convincing/convincing and not catchy/catchy) of three fictitious brands. The brand name EcoCell was more positively evaluated (*M*=4.47, SD=1.15) than EarthPhone (*M*=3.72, SD=1.47) or PeKe (*M*=2.54, SD=1.28).

Main Study

Study Design and Stimuli

A 2 (celebrity political ideology: Democrat vs. Republican) x NEP (measured) between subjects design was employed. For the stimuli, four full-colored advertisements were created in which a celebrity is shown endorsing an environmentally friendly cell phone (See Appendix 1 & 2). The upper part of the advertisement includes the picture of a celebrity and their comments endorsing the product and emphasizing the environmental attributes of the product. The lower part of advertising contained the picture of a cell phone and additional short descriptions about the environmental attributes of the product. All elements in the advertisement remained the same across all conditions, except the picture of a celebrity and their name (See Appendix 1 & 2). Prior to exposure of advertisement, a brief topper introduced the ad and indicated which political party (either Democratic or Republican) the celebrity identified with (See Appendix 1 & 2).

Sample

As the data-collection method, the current study employed a self-administered online experiment at a large U.S. university in the southwest. College students were deemed appropriate for the study since they are vulnerable to the effect of endorsements in every aspect of their life (Brockington, 2015) and despite relatively lower levels of political interest compared to oler age groups, previous research has found young people are highly concerned with and involved in a wide range of political issues (White et al., 2000). In addition, not only are younger consumers more sensitive to environmental issues, but they also represent the

future of green consumption (Straughan & Roberts, 1999) Thus, they are considered a potentially large group of supporters for environmental protections. Furthermore, younger consumers are expected to provide a widest range of attitude toward green advertisements (Auger et al., 2003).

A total of 215 participants took an online experiment: 65.1% were female; mean age was 21.34; 60.5% were white, 16.7% were Asian/Asian American, 16.7% were Latino/Hispanic, 4.2% were African-American and 1.9% identified as belonging to multiple categories. In regard to political party, 54% of the participants thought of themselves as Democrats and 45.6% identified as Republican.

Procedure and Measures

After a brief explanation about the experiment, subjects were asked to respond to the abridged NEP (5 items, a seven-point Likert scale; 1 = strongly disagree, 7 = strongly agree; M = 4.93, SD = 1.01; α = .821). The NEP was adapted from Dunlap et al. (2000)'s research to examine subjects' levels of environmental concern. Participants were then randomly assigned to one condition, either a Republican celebrity endorser (Carrie Underwood or Tim Tebow) or a Democratic celebrity endorser (Jennifer Lawrence or Leonardo Dicaprio). Introductory text explained who the celebrity was and which political party they belonged to.

Following exposure to the advertisement, participants proceeded to answer questions concerning the four dependent variables: celebrity-product fit (13 items, a six-point Likert scale; 1 = strongly disagree, 6 = strongly agree; M = 3.66, SD = .75; α = .838), celebrity credibility (15 items, a six semantic differential sale; e.g., reliable - unreliable; M = 2.64, SD = .85; α = .916), celebrity trustworthiness (7 items, a six-point Likert scale; 1 = strongly disagree, 6 = strongly agree; M = 3.75, SD = .69; α = .804), attitude toward the advertisement (4 items, a six semantic differential sale; e.g., appealing - not appealing; M = 3.74, SD = 1.26; α = .894), and purchase intention (2 items, a six-point Likert scale; 1 = strongly disagree, 6 = strongly agree; M = 2.07, SD = 1.09; α = .912).

Upon completion, participants answered two potential covariates: participants' political ideology (1 item; indicate whether they think of themselves either republican or democratic), celebrity familiarity (1 item, a five-point Likert scale; 1 = not at all familiar, 5 = one of my

favorite celebrities; *M* = 3.49, SD = .72), and cell phone involvement (5 items, a seven-point Likert scale; 1 = strongly disagree, 7 = strongly agree; *M* = 6.32, SD = .87; α = .894). For manipulation checks, the participants were then asked to indicate which celebrity they saw in the advertisement, which political party the celebrity belonged to (either Republican or Democratic party) and the strength of the celebrity's political ideology (1 item, a six semantic differential scale; extremely conservative - extremely liberal). Lastly, the participants were asked to answer demographic questions and thanked (See Table 1 for scales and items). See Table 1 for all scales and item wording.

Table 1. Summary of Scales and Items

***New Environmental/Ecological Paradigm (NEP) (α* = .821)**
The so-called "ecological crisis" facing humankind has been greatly exaggerated*
If things continue on their present course, we will soon experience a major environmental catastrophe
Humans are severely abusing the environment
The balance of nature is strong enough to cope with the impacts of modern industrial nations*
The earth is like a spaceship with very little room and resources
***Celebrity-product fit (α* = .838)**
It makes no sense to me that this celebrity would be hired to be a spokesperson*
I like the celebrity endorsing the product
I think of the celebrity endorsing the product as a good friend
The celebrity endorsing the product likes the EcoCell brand
The celebrity endorsing the product frequently uses the EcoCell brand
The celebrity endorsing the product views the EcoCell brand as a good product
This celebrity would never be seen endorsing any products*
The idea of this celebrity endorsing a product sounds logical to me
I can easily relate to the celebrity endorsing the product
I can see this celebrity advertising some product
This person would be a good celebrity endorser
The celebrity endorsing the product is a personal role model
I have no doubt the celebrity endorsing the product and I would work well together
***Celebrity credibility (α* = .916)**

Classy – Not classy

Reliable – Unreliable

Beautiful – Ugly

Attractive – Unattractive

Dependable – Undependable

Skilled – Unskilled

Honest - Dishonest

Expert – Not expert

Sexy – Not sexy

Trustworthy – Untrustworthy

Elegant – Plain

Qualified – Unqualified

Knowledgeable - Unknowledgeable

Experienced - Inexperienced

***Celebrity trustworthiness (α* = .804)**

The celebrity's statement is honest

The celebrity's statement is factually accurate

The celebrity's statement is trustworthy

The celebrity's statement is genuine

The celebrity's statement is intelligent

The celebrity's statement is ethical

The celebrity's statement is self-centered*

***Attitude toward advertisement (Aad) (α* = .894)**

Likeable – Not likeable

Believable – Not believable

Interesting – Not interesting

Appealing – Not appealing

***Purchase Intention (PI) (α* = .912)**

If I were to purchase a cell phone right now, I would buy this product

If I were in a situation where I needed to recommend a cell phone to friends, I would recommend purchasing this product

***Cellphone Involvement (α* = .894)**

Cell phones are very relevant to me

Cell phones are very important to me
Cell phones matter to me
Cell phones are very interesting to me.
Cell phones are very useful to me.

* indicates the reversed item

Results

Manipulation Check

To assess whether the celebrities framed in the four advertisements were indeed perceived as intended, a manipulation check was conducted. Two participants did not recall the celebrity they saw in the advertisement and were excluded from further statistical analysis. The remaining participants correctly reported which celebrity they had seen and the celebrity's political ideology.

In addition, the result of a simple t-test demonstrated that the participants perceived celebrities in the Democratic party condition to be more liberal (M = 4.74, SD = .85) whereas they perceived celebrities in the Republican party condition to be more conservative (M = 2.67, SD = 1.09, $t(213)$ = -15.521, p < .01). Thus, manipulations were effective and successful.

Hypothesis Testing

To test our hypotheses, we ran a series of multiple regression analyses, rather than ANOVAs, since the latter requires reducing continuous data to categorical data, thereby wasting valuable information (Govindarajan & Fisher, 1990). In the series of analyses, the results indicated there were no differences between the male and female celebrities of the same political ideology, thus the data for both celebrities in each political ideology condition were collapsed.

Prior to conducting multiple regression analyses, centered versions of NEP (M = 4. 84, SD = 1.01), celebrity familiarity (M = 3.49, SD = .72), and cell phone involvement (M = 6.32, SD = .87) were mean-centered. An interaction variable was created to test the hypothesized interaction effect between the type of celebrity party and NEP.

Participants' political ideology (coded 0 for Republicans and 1 for Democrats), celebrity familiarity, and cellphone involvement were controlled for by entering data in the first step of the regression. Each outcome variable was then regressed onto NEP (centered), types of celebrity party (coded 0 for Republican and 1 for Democrats), and the celebrity party x NEP interaction term. Table 2 shows results of the regression analysis.

Table 2. Summary of Multiple Regression Analyses

	Celebrity-product fit			Celebrity credibility			Celebrity trustworthy			Aad			PI		
	β	SE	*t*	*B*	SE	*t*	*β*	SE	*t*	*β*	SE	*t*	*β*	SE	*t*
Celebrity familiarity	.228	.07	3.235**	-.347	.076	-4.573**	.196	.065	3.019**	-.181	.121	-1.498	.002	.105	.023
Cellphone involvement	.03	.059	.520	-.166	.063	-2.638**	.042	.054	.780	.095	.100	.950	-.126	.087	-1.447
R^2		.052			.136			.049			.013			.010	
Model F		5.860**			16.644***			5.462**			1.362			1.076	
Celebrity familiarity	.227	.071	2.918**	-.340	076	-4.488***	.200	.065	3.071**	-.186	.121	-1.535	.020	.103	.189
Cellphone involvement	.03	.059	.518	-.166	.063	-2.638**	.042	.054	.785	.095	.100	.946	-.125	.086	-1.455
NEP	-.009	.050	-.177	.083	.054	1.551	.045	.046	.972	-.059	.085	-.688	.204	.073	2.799**
R^2		.053			.145			.053			.015			.046	
Model F		3.899**			11.971***			3.956**			1.063			3.353*	
ΔR^2		.039			.133			.040			.001			.032	
Incremental F		.031			2.405			.945			.473			7.837**	
Celebrity familiarity	.203	.070	2.918**	-.308	074	-.264***	.182	.065	2.821**	-.171	.122	-1.409	.017	.104	.160
Cellphone involvement	.036	.058	.621	-.173	.061	-2.847**	.046	.053	.868	.092	.100	.913	-.124	.086	-1.444
NEP	-.011	.049	-.218	.085	.052	1.652	.043	.045	.955	-.058	.085	-.675	.204	.073	2.790**
Celebrity party	.309	.099	3.122**	-.416	.105	-3.983***	.226	.092	2.464*	-.186	.173	-1.075	.038	.148	.254
R^2		.095			.205			.080			.020			.046	
Model F		5.483			13.576**			4.556			1.087			2.520	

		***			*			**						*	
ΔR^2		.077			.190			.062			.002			.028	
Incremental F		9.747 **			15.861** *			6.072 *			1.156			.065	
Celebrity familiarity	.238	.067	3.528 **	-.346	.071	-4.877 ***	.203	.064	3.164 **	-.207	.121	-1.707	.044	.104	.424
Cellphone involvement	.020	.055	.356	-.155	058	-2.668 **	.037	053	.697	.108	.099	1.089	-.137	.085	-1.605
NEP	-.623	.148	-4.209 ***	.760	.156	4.876 ***	-.323	.141	- 2.294 *	.572	.266	2.150*	-.286	.228	-1.252
Celebrity party	.303	.095	3.195 **	-.410	.100	-4.105 ***	.222	.090	2.465 *	-.180	.170	-1.055	.033	146	.226
NEP x Celebrity party	.412	.095	4.363 ***	-.454	.100	-4.564 ***	.247	.090	2.744 **	-.424	.170	-2.496 *	.330	.146	2.263 *
R^2		.170			.277			.112			.049			.069	
Model F		8.569 ***			16.052 ***			5.263 ***			2.137 *			3.079 *	
ΔR^2		.150			.260			.091			.026			.046	
Incremental F		19.034 ***			20.827 ***			7.527 **			6.230 *			5.121 *	

*p < 0.05; **p ≤ 0.01; ***p 0.001

Celebrity-Product Fit

Controlling for celebrity familiarity (p < .01), cellphone involvement (p > .1), and participants' political ideology (p > .1), the results showed that the main effects of both NEP (β = -.271, t = -2.943, p < .01) and celebrity party (β = .202, t = 3.184, p < .01) were significant. This suggests that participants with higher levels of NEP exhibited lower perceptions of celebrity-product fit. Participants perceived that more liberal celebrities than conservative celebrities were fit better for the environmentally friendly cellphone advertisement. Thus, H1a was supported.

Further analysis demonstrates that higher NEP participants thought Democratic celebrities were a better fit for environmentally friendly product advertising (β = .232, t = 2.259, p < .05), whereas Republican celebrities were a weaker fit for the advertising (β = -.276, t = -2.885, p < .01). Thus, H2 was supported.

Celebrity Trustworthiness

Controlling for celebrity familiarity ($p < .01$), cellphone involvement ($p > .1$), and participants'' political ideology ($p > .1$), a significant celebrity party main effect was found ($\beta = .162$, $t = 2.474$, $p < .05$), but the NEP main effect was not significant ($\beta = -.137$, $t = -1.435$, $p > .01$), suggesting that participants considered Democratic celebrities as more trustworthy than Republican celebrities in the environmentally friendly cellphone advertisement. Thus, H1b was supported. Further analysis revealed that participants with higher levels of NEP were more likely to believe that Democratic celebrities were trustworthy ($\beta = .238$, $t = 2.299$, $p < .05$); NEP was not significant in the Republican celebrity condition ($\beta = -.15$, $t = -1.472$, $p > .1$), supporting H3.

Attitude toward the Advertisement (Aad)

Controlling for celebrity familiarity ($p > . 1$), cellphone involvement ($p > .1$), and participants' political ideology ($p < .05$), the results showed that while the main effect of NEP approached significance ($\beta = -.188$, $t = -1.935$, $p = .054$), the main effect of celebrity party was not significant ($\beta = .073$, $t = 1.096$, $p > .1$). The results suggested that participants with higher levels of NEP tended to evaluate the endorsed environmental advertisement less favorably, but the evaluation was not different according to celebrity political ideology.

A significant interaction effect was found between NEP and celebrity party ($\beta = .233$, $t = 2.486$, $p < .05$). In specific, participants with higher levels of NEP exhibited a more negative reaction to the Republican celebrities' advertisements ($\beta = -.217$, $t = -2.097$, $p < .05$), but showed a more positive pattern to the Democratic celebrities' advertisement although this did not reach to the statistical significance ($\beta = .158$, $t = 1.509$, $p > .1$). Thus, H4 was not supported.

Purchase Intention (PI)

Neither NEP nor celebrity party showed significant main effects (NEP: $\beta = -.006$, $t = -.065$, $p > .1$, celebrity party: $\beta = .016$, $t = .246$, $p > .1$). However, further analysis showed that participants with higher levels of NEP were more inclined to purchase the advertised product when the celebrity endorser was a Democrat ($\beta = .294$, $t = 2.880$, $p < .01$). The level of NEP

did not have effect on purchase intention when the celebrity in advertisement was Republican (β = -.041, t = -.394, p > .1). Thus, H5 was supported.

Discussion

The results indicate that, overall, Democratic celebrity endorsers are more effective than Republican celebrity endorsers in the context of green products. Compared to Republican endorsers, Democratic celebrities pitching green products were seen as a better fit and more trustworthy. When we look at the moderating role of environmental concern, some interesting interactions are revealed. In particular, these positive outcomes for Democratic celebrity endorsers are pronounced among those who report high levels of environmental concern. Among these kinds of consumers, Democratic celebrities are not only seen as a better fit and more trustworthy but are also likely to yield more positive attitudes toward the ad and higher levels of purchase intent. On the other hand, Republican celebrity endorsers are seen as a weaker fit for green advertising messages and induce more negative reactions toward the advertisement among consumers who report higher levels of environmental concern.

These findings offer important theoretical implications for the celebritization of environmental issues. Specifically, congruency between celebrity endorsers and their political ideology matters. In the context of green products, only liberal celebrities are seen as trustworthy spokespeople. Given the Democratic Party's ownership of green issues and support for claims that humans are responsible for climate change, it makes sense that Democratic celebrities would offer more resonance. If the goal was to broaden the political base of celebrity spokespeople by trying to reach Republican consumers via Republican celebrities, the effects seem to be limited. It suggests that the celebritization of environmental issues is seen more properly as the purview of liberal celebrities rather than conservative ones.

As well, given the patterns of interactions, the findings suggest that the celebritization of climate change resonates most effectively with those who are already concerned about the environment. As an effective form of messaging, then, it might be that celebritization only works among those who are already inclined to agree with the message.

The findings offer important practical implications, too. For a green product considering

hiring a celebrity as an endorser, they would be wise to select a Democratic one. Communication campaigns that incorporate conservative celebrities are largely ineffective and efforts to broaden the message outside public conception of the environment as a Democratic issue will be unrewarded.

Limitations and Directions for Future Research

Although the results of the current study are significant, they are not without limitations. First, our findings are limited by our sample design to college students. While college students are an important and valid population to study in the context of green consumption, future studies could test these same relationships among a non-students sample. Second, we measured purchase intent, rather than actual purchase behavior. However, while real world purchasing choices would be ideal, the theory of reasoned action (Fishbein & Ajzen, 1975) argues that intention is highly correlated with actual behavior and stands as a useful proxy.

Lastly, this study suggests important avenues for future research. One useful extension of would be to investigate the match between celebrity endorsers' and consumers' political ideology in green product advertisement. Current research suggests that individuals who have higher degrees of environmental concern positively respond to green product advertisements that endorsed by Democratic celebrities. However, if the consumers' political ideology is matched with the celebrity's ideology, it might motivate consumers to have more positive responses to a green product advertisement. Furthermore, future research can examine whether celebrity endorser's political ideology has an effect on consumers who are politically neutral. Democrats tend to display higher rates of environmental concern and greater tendencies to the ecocentrism than Republicans. For example, considering fundamental idea of each political party, consumers who take a litmusless political position might be persuaded by celebrity endorsers who portray them as Democrats in green product advertising.

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Appendix 1. Stimuli

<Stimuli used for Democrat Celebrity Endorsement>

The ad on this page shows Leonardo DiCaprio, a well-known actor, endorsing a new environmentaly friendly cell phone.

DiCaprio, who describes himself as a Democrat, has been nominated for numerous acting awards.

Appendix 2. Stimuli

<Stimuli used for Republican Celebrity Endorsement>

The ad on this page shows Carrie Underwood, a well-known singer and actress, endorsing a new environmentaly friendly cell phone.

Unerwood, who describes herself as a Republican, found fame on American Idol.

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Chapter 9 - In the Name of the Love: An Empirical Study of Intimate Partner Violence in Chinese News Reports in 2010 and 2020

Weixiao Tang

Chapter Highlights

- The media portrayals of intimate partner violence (IPV) have implications for public perceptions of IPV.
- On this basis, the transformation of the media's portrayals of IPV could change the public perceptions of IPV and further influence how government and society respond to this issue.
- To better understand these portrayals, this study examined how Chinese media portray IPV, and what changes have taken place in the portrayals of IPV by taking mainstream news media in China in two-time points—2010 and 2020, as examples.
- The results from a total of 788 articles showed that in 2010, the news frame used by IPV reports tended to be skewed towards the episodic frames, while the thematic frames have already been dominant in the news framing of IPV reports in 2020.
- In addition, as an important part of the frames, the contextual features of the incidents in Chinese IPV reports and how these features changed in these ten years are explored.
- Based on these results, Chinese news media's implications for IPV-related public perceptions and social policy are discussed.

Introduction

When individuals face unfamiliar social issues, they rely on information to reduce uncertainty and build their views. News media has always been an important source of information. Previous studies have shown that media coverage of health issues can affect the public's response to specific social problems (Carlyle et al., 2008; Smith, 2019; Locke & Bandura, 1987). The story framing of media reports has strong implications on the audience through suggesting (AlKhudari, Almashaqbeh, & Alkhaza'leh, 2022; Nelson et al., 1997; Iyengar, 1991; Kenski & Zaller, 1993; Iyengar & Simon, 1993). Therefore, how the media use frames to portray the problems and events of intimate partner violence (IPV) may have noticeable implications on the public perceptions and public opinions of this issue. In addition, a Portuguese study suggested that the use of news frames in IPV coverage changed significantly from 2006 to 2014 (Magalhães-Dias, 2016). It could be inferred that the portrayal of media and the use of media frames on IPV may change over time, and its impact on public perceptions may also change correspondingly.

The existing studies of media reports and IPV are carried out in the western context. There are still gaps in the research on how Chinese media report IPV events and shape the social receptions of IPV. At the same time, there are few studies vertical comparing the use of news frames in Chinese media reports. To better understand how Chinese media portray IPV, how the portrayal of IPV changed over time, and the possible impact on public perceptions of IPV, this study analyzed the typologies of frames and contextual features used in IPV reports in national representative newspapers in two-time 2010 and 2020 and made a longitudinal comparison.

The research found that Chinese IPV coverage in 2010 was consistent with the research results of other countries and regions, that is, the proportion of using episodic frames exceeds that of thematic frames. However, by 2020, the use of thematic frames has far exceeded the episodic frames. Contextual features of Chinese IPV reports in 2010 and 2020 have many common places, such as incidents involved in physical violence are extremely dominant in all reported incidents. There are also several noticeable changes between reports in 2010 and 2020. Compared with 2010, IPV coverage in 2020 reported more incidents involving verbal violence and emotional violence, fertility-related issues, etc., while reported less psychological trauma suffered by victims and perpetrators' violent history.

Literature Review

Intimate Partner Violence and Public Perception of IPV

IPV is a common but hidden public health problem, including physical, sexual, mental, and other forms of harm inflicted by a current or former partner (CDC, 2011; WHO, 2012). It is the most common form of domestic violence (Durose et al., 2005). The WHO reported that the incidence of violence against women worldwide is 35%, including physical violence and other types of violence from intimate partners (WHO, 2014). 29% of women and 22% of men reported experiencing physical, sexual, or psychological IPV in their lifetime (Coker et al., 2002). In China, a large-scale study conducted in seven provinces shows that the incidence of physical and psychological violence in domestic violence is 34.8% and 55.6% respectively (Cui, Hong, & Ying, 2012). IPV does great harm to both the individual victims, as well as society as a whole. IPV can be life-threatening for the victims, with other possible negative effects, such as sexual dysfunction, sleep disorder, depression, anxiety, and post-traumatic stress disorder (Torpy, 2010). To society, IPV leads to the great loss of productivity, affects social economic health, and brings huge costs to society in the formulation of criminal justice and public policies (Deprince, et al., 2011).

Unlike other forms of violence, IPV always occurs in the private sphere and is rarely reported publicly. Although public awareness of intimate partner violence has improved in recent decades, there are still numerous inappropriate perceptions of IPV in society. The public often views IPV incidents as domestic problems or personal matters, rather than social issues (Carlson & Worden, 2005). Regarding IPV as a personal problem abandons the social root of violent incidents and then absolves social obligation to reduce IPV incidents (Carll, 2003). This is not conducive to promoting the government and social institutions to make a positive response to the IPV issue. Meanwhile, the social and cultural norms of keeping family privacy, and maintaining marriage contracts also make victims choose to conceal the fact of being abused and keep silent (Few, 2005). This perception prevents them from being protected from society. Moreover, there are a series of popular hypotheses in society, which can be regarded as the stigmatization of victims. For instance, the victims are believed to be the cause of the violence and they are personally responsible for their mistakes (Taylor & Sorenson, 2005; Carlson & Worden, 2005). This public opinion undoubtedly caused secondary harm to the victims. It can be seen that social values and opinions of the public have a notable influence on how the whole society deals with domestic violence. Society's

ignorance, misunderstanding, and, silence on IPV represented the tolerance of the society to it and further hindered the reform and development of relevant laws, policies, and services (Stalans & Lurigio, 1995).

Media's Role in Public Perceptions of IPV

Media discourse has a profound influence on public perceptions since it is a potential source of public opinion that can provide consistent social acceptance (Smith, 2019; Locke & Bandura, 1987). The media sector plays an important role in the representation of issues of IPV, as well as reflecting and shaping relevant public opinions. Carlyle (2008) stated that the way the media portrays intimate partner violence, including the form and content of the reports, tends to affect the public's response to intimate relationship violence, to further affect individual behavior. Lloyd and Ramon (2017) also argue that news media can project-specific views on domestic violence and marginalize other views, which has an important impact on public understanding and policy-making. Journalists create an image of IPV incidents by choosing specific sources, arguments, photos, information, etc., or omit some of them. Through the process of choosing or omitting this information, journalists can influence which content is important and which can be ignored by public opinion (Jabeen, 2014; Rollè et al., 2014). Issues that are ignored are placed outside the public interest. News media can not only provide information about IPV incidents but also hint at the causes and consequences of events (Sotirovic, 2003; Haider-Markel & Joslyn, 2001). These effects of media coverage are closely related to its frame.

Media Framing of IPV

The frame is a fundamental component of news reports, which can be defined as "a central organizing idea or storyline" (Gamson & Modigliani, 1987, p.143). To a large extent, the frame of the media coverage can influence the public's understanding of intimate partner violence. De Vreese et al. (2001) described the central dimension of the frame as the choice, organization, and emphasis of some aspects of reality while excluding others. Therefore, the effectiveness of the frames lies in that they can make some elements, features, and viewpoints in social issues more prominent, thus leading readers to certain interpretations and understandings (Nelson et al., 1997). The frame of news will also impact responsibility attribution of the issue, that is, who is to blame for the incident and who should be

responsible to find a solution for it (Iyengar & Simon, 1993). Such attribution will further cause readers' specific emotions, and then affect their judgment, preference, and behavior (Kosicki, 2002; Weiner, 1980). In this regard, Nabi (2003) also proposed the similar idea that emotion can have a framing effect, which can affect readers' interpretation of information and subsequent decision-making. Public acceptance of a particular framing is higher if it is framed frequently (Carlyle, et al., 2008). Numerous studies have concluded that the repetitive way these frames are presented to people can gradually shape their perception of IPV (Iyengar, 1991; Kenski & Zaller, 1993).

Typologies of Frames

To further discuss how a social issue is framed through media coverage, Iyengar (1991) introduced two specific essential types of news reporting: episodic frames and thematic frames. The episodic framing usually described the issue in terms of specific events on the individual, while the thematic framing tended to “take the form of in-depth background-focus on social roles, as well as the individual (Iyengar, 2011, p.253). According to the characteristics of the two frames, some studies pointed out that episodic frames are more engaging than automatic frames (Aarøe, 2011; Iyengar, 1991; Gross, 2008). This appeal is considered to be related to the cohesive and episodic narrative arc, the relatively digestible nature, and the personal connection to the individual that is contained in the episodic frame (Springer & Harwood, 2015). It explains the fact that in the coverage of violent themes, the frequency of episodic frames tends to be much higher than that of thematic frames (Dorfman et al., 1997). Journalists may use more episodic frames to make IPV reports more engaging for readers.

Nevertheless, the frequent use of episodic framing rather than thematic framing will promote the lack of social attribution of intimate partner violence issues. Iyengar (1990, 1991) found that under the influence of the thematic frames, individuals tend to assign the responsibility of the issue to the whole society, while readers of the episodic framing coverage always assign the responsibility of the issue to the individual victims. According to what Gracia (2004) asserted, the lack of social responsibilities attribution of IPV issue is one of the important factors affecting the rate of this kind of violence. The thematic framing can be constructed by the inclusion of various contextual information, including data of victimization rate and mortality rate, etc., expert analysis, research reports on prevention and

intervention, and community and policy-based remedies (Lawrence, 2004; Kim & Willis, 2007). The use of more thematic frames can promote people to regard IPV as a social concern, to give impetus to the society to provide a variety of protection services, reform laws, policies, etc., eventually reducing the rate of IPV incidents. In turn, the current situation that the use of episodic frames far exceeds the thematic frame in IPV media reports may lead to the lack of social attribution of intimate partner violence and hinder society from playing a role in dealing with IPV problems and events.

It should not be ignored that previous studies on the use of media frames in IPV are carried out under the western context. Although the issue of IPV has gradually attracted attention in China in the past two decades, few studies have evaluated the relationship between the media and such violence. Studies on how Chinese media report the IPV issue and shape the social cognition of IPV are seldom done, and there are even fewer researches on the vertical comparison of the use of frames in Chinese IPV reporting. To understand the changes in the use of the frames and its impact on IPV public opinion in the past decade before China's IPV reporting, it is necessary to examine the use proportion of episodic frame and thematic frame in Chinese IPV reporting in 2010 and 2020, as well as the gap between them. Hence, this study points the following research question:

> RQ1: (a) Is the IPV coverage in China consistent with the research results of other countries and regions, that is, the proportion of using episodic frames exceeds that of thematic frames? (b) Compared with the IPV report in 2010, is there any significant change in the proportion of the use of the episodic frames and thematic frames in the IPV news report in 2020? (c) What frames are predominantly used in thematic reports of IPV? Is there any significant change in the decade?

Contextual Features of IPV

The media framing usually consists of three parts: sources, word choice or language, and contextual features. Regarding intimate partner violence, these components shape the frames, as well as convey a specific understanding of IPV to consumers (Bullock & Cubert, 2002). The contextual feature is an important component of the media frame. In media portrays, contextual features often arise, which plays a significant role in guiding public opinion and attracting the attention of government, judicial system, and social institutions, eventually influencing the rate of IPV.

Reasons behind the IPV incident could be one of the types of contextual features. The data on domestic violence shows that the alcohol and drug use of perpetrators is one of the striking reasons for the high incidence of physical, sexual, and psychological violence (Leonard and Eiden, 2007). The snowball effect seems to exist in domestic violence and alcoholism, bringing about that the number of IPV events continuously increases (WHO, 2005). However, many studies put forward that the role of alcohol in violent crime is underestimated in the public realm (Slater, Long & Ford, 2006). This underestimation may be related to the fact that the rate of alcohol being considered as the influencing factor of IPV in news reports is lower than in the actual situation (Carlyle, et al., 2008). The neglect of the attribution of substance use in the news context will hinder the intervention of public health institutions on alcohol and drug-induced violence.

In addition to the reasons behind the IPV incident, there are many other significant contextual features in IPV media coverage. Type of violence is one of them. In the news reports of IPV, the incidents of physical violence account for the majority, and the IPV incidents causing death are reported especially frequently. A Hong Kong study on domestic violence news reports also concluded that 94% of the news samples tend to focus on physical abuse (Chan, 1997). On the contrary, psychological and other forms of intimate relationship violence are ignored by the media, even though they can also cause a series of severe injuries, including depression, paranoid ideation, psychoticism, and so on (Vilariño, et al., 2018; Karakurt et a., 2014). This neglect consolidates the idea that physical violence is the mainstream type of IPV while weakening the seriousness of other violence types in public awareness. It impedes victims of other types of domestic violence from escaping from the perpetrators and striving for their rights (Stalins & Lurigio, 1995).

How the IPV incident is labeled by news coverage is a noteworthy contextual characteristic as well. According to Bullock and Cubert (2002)'s research, of the 230 newspaper articles on domestic violence homicide, only less than 25% of incidents are defined as domestic violence. Wozniak and McCloskey (2010) took 100 newspaper articles about IPV homicide as samples, found that 72% of them did not mention domestic violence at all. Taylor (2009) reviewed 292 news reports from the Orlando Sentinel that were related to 168 IPV murders, only about 34% of them were labeled as domestic violence in some way. These studies show that a large number of news coverage describe IPV events as ordinary and isolated events, which hardly produce positive effects on the public's awareness of IPV.

In fact, in addition to the generally noteworthy contextual features mentioned above, the examination of China's IPV report also needs to pay attention to some contextual features specifically related to Chinese culture and customs, such as conflicts between mother-in-law and daughter-in-law and the "face" issue. At the same time, the longitudinal study on contextual features in Chinese IPV reports is also an almost blank field. To study the changes in the news frame use of China's IPV reports in the previous decade, it is necessary to test the noteworthy contextual features in China's IPV reports in 2010 and 2020 respectively, and make a longitudinal comparison.

Hence, this study proposed the second research question as followed:

> RQ2: (a) In China's IPV reports, what contextual characteristics of the incidents reported are noteworthy? (b) Is there any significant change of contextual features in China's IPV reports between 2020 and 2010? What has changed?

Method

Data Collection

The study applied quantitative content analysis to identify the overall frames in the news and editorial content of IPV portrayals in Chinese newspaper coverage both in 2010 and 2020. In this study, all the news reports related to IPV should be contained in our dataset. There are two main data sources in this study, one is Factiva, the global news monitoring and search database, while the other one is WiseSearch, the media database mainly containing news from Mainland China. The time frame of this study contained two time periods, one is from 1 January 2010 to 1 January 2011, and the other is from 1 January 2020 to 1 January 2021.

Depending on the research questions and hypotheses, the researcher used the keyword of “domestic violence” in searching the news both in the years 2010 and 2020. This procedure yielded a total of 1908 news stories from 2010 and 658 news from 2020. Then, the researcher screened 589 Chinese news reports related to IPV issues and events specifically (i.e., does not include stories about violence between family members other than intimate partners) as the research sample in 2010. In the same way, this study finally got 199 news reports in the Chinese Mainland that mentioned IPV as a sample from 2020. This study contains 788 news articles.

Measurement

To figure out how the portrayals of IPV in Chinese media coverage have changed over the last ten years, different coding units were used. To describe the sample, all the articles were coded for their newspaper category, day and date of publishing, and placement of reports. Other variables coded were primary news framework (episodic vs. thematic), the specific type of thematic framework (eg., government responses to IPV, a public health perspective), and contextual feature (eg. potential reason behind attack, types of IPV, personal history information about perpetrator and victim, outcomes of the incident).

Each news report was coded according to the newspaper category: party organ, and market-oriented newspaper. The date of publishing of samples was also coded as 2010 and 2020. Moreover, the placement of reports was noted by recording where articles appeared in the paper: front page or inside page. In addition, the coder read the whole news report and then differentiated the 788 news articles into episodic reports and thematic reports. On this basis, thematic reports were also coded according to what specific thematic frameworks they were used. Referring to the coding method of Carlyle et al. (2008), samples were coded as government responses to IPV (eg. policies, laws), a public health perspective (eg. prevention, social and psychological impact), community response, and information on IPV resources. The coding method of IPV incidents' contextual features was mainly referred to by Carlyle et al. (2008) as well. As important contextual features, identity status and personal history information of the perpetrator and victim were coded in this study. Gender was coded as male and female; social status was coded as public figures, sports stars, not famous; and personal history information is coded as alcoholism, drug use; criminal history; infidelity, violent behavior, mental disease. To investigate the types of violence presented in China's IPV news reports, this study combined the classification of IPV forms by Carlyle et al. (2008) and Desmaris et al. (2009), coding IPV incidents as involving physical, verbal, emotional, economic, sexual violence. The reason behind the IPV incident was also coded. Eight reasons were based on Carlyle et al. (2008)'s research: money, victim infidelity, alcohol use, drug use, perpetrator's new romantic interest, stress, anger, jealousy. For the consideration of specific Chinese context in this study, four reasons were added, which are the face, the relationship between mother-in-law and daughter-in-law, feudal superstition, and fertility. Finally, the consequences of IPV events were coded by assessing the whole news report. Articles were

coded as the victim survived but suffered physical injury, the victim survived but suffered the mental injury, the victim died, the victim killed the perpetrator (including hiring murderers).

Results

This study compared the portrayals of IPV by Chinese news reports in 2010 and 2020. 788 reports were analyzed with 589 in 2010 and 199 in 2020. The type of primary frames employed by Chinese news reports, whether it was consistent with previous research results of other countries indicating more episodic than thematic framing, and whether this situation has changed significantly between 2010 and 2020 were of interest in Question 1.

As shown in Table 1, results of Chinese news coverage in 2010 were consistent with previous research (Maxwell et al., 2000; Carlyle et al., 2008), that is, news reports using episodic frames are dominant. Episodic framing was used in 63.3% of IPV reports, while 36.7% of coverage is adopted thematic framing. However, results of Chinese news reports in 2020 show that much more thematic framing has already been used than episodic framing. The percentage of episodic coverage decreased significantly from 63.3% in 2010 to 15.1% in 2020, whereas the proportion of thematic coverage increased from 36.7% in 2010 to 84.9% (chi-square =138.6, $p<.05$).

Table 1. Comparison of Typologies of News Frames used in Chinese News Reports in 2010 and 2020

Typologies of news frames	Percent of total articles in 2010 (n=589) %	Percent of total articles in 2020 (n=199) %	Difference (chi-square)
Episodic frame	63.3	15.1	138.6*
Thematic frame	36.7	84.9	138.6*

Note: * $p < .05$.

Research Question 1 also asked what are the predominant news frames for thematic coverage, and how they changed between 2010 and 2020? As Table 2 indicates, of all articles in 2010 using thematic framing, the most commonly used news frame (presented in 84.7%) is the thematic frame involved in public health perspective, including social prevention and

psychological impact. Thematic frame addressed government responses to IPV, such as policies and laws was included in 57.4% of thematic reports. In addition, 43.0% of thematic coverage adopted news frames that addressed information on IPV resources, while 24.5% of that provided community response.

In 2020, although the two most common thematic frames are still frames addressed government responses to IPV and public health perspective, the percentage of thematic coverage that includes government responses to IPV significantly increased from 57.4% in 2010 to 74.6% (chi-square=12.2, $p<.05$), whereas that of a public perspective significantly decreased from 84.7% in 2010 to 74.0% (chi-square=6.9, $p<.05$).

Meanwhile, the proportion of thematic coverage adopting frames provided information on IPV resources and community response also decreased from 43.0% in 2010 to 16.6% in 2020 (chi-square=30.9, $p<.05$), and from 24.5% in 2010 to 10.7% in 2020 (chi-square=12.2, $p<.05$) respectively. These changes may be related to the changes in the market share of newspaper categories in the past decade (chi-square=7.7, $p<.05$). As Table 3 shows, the percentage of party newspapers that tend to report government responses rather than other information increased from 48.2% in 2010 to 58.6% in 2020 ($z=1.9$, $p<.05$).

Table 2. Comparison of Predominant News Frames for Thematic Coverage in 2010 and 2020

News frames for thematic coverage	Percent of thematic coverage in 2010 (n=216) %	Percent of thematic coverage in 2020 (n=169) %	Difference (chi-square)
Government responses	57.4	74.6	12.2 *
A public health perspective	84.7	74.9	6.9 *
Community response	24.5	10.7	12.2*
Information on IPV resources	43.0	16.6	30.9*

Note: * $p < .05$.

Table 3. Comparison of the Category of Newspaper in 2010 and 2020

Newspaper category	Percent of total articles in 2010 (n=589) %	Percent of total articles in 2020 (n=199) %	Difference (chi-square)
Party newspaper	48.2	58.6	1.9*
Market-oriented newspaper	45.9	40.2	
Other	6.0	1.2	

Note: * $p < .05$.

Research Question 2 was interested in contextual features of the incidents reported. As Table 4 presents, it is notable that physical violence was overwhelmingly dominant in all types of IPV involved in news reports in both 2010 and 2020. Almost all of the incidents reported (98.47% in 2010, 100% in 2020) include physical violence. On the contrary, few IPV incidents involving economic (3.7% in 2010, 0.5% in 2020) or sexual violence (4.5% in 2010, and 5.5% in 2020) were reported. In addition, money (represented in 13.4% of incidents in 2010, 13.1% of incidents in 2020), alcohol use (represented in 13.4% of incidents in 2010, 12.12% of incidents in 2020), and anger (represented in 13.0% of incidents in 2010, 14.1% of incidents in 2020) were portrayed as relatively common causes of IPV events. In terms of IPV incidents' consequences, most of the victims (85.5% in 2010, 76.8% in 2020) were survived but suffered physical injuries.

According to Table 5, it is worth noting that no IPV incidences of same-sex couples were reported in both 2010 and 2020. The victims in reports were mainly women (accounted for 89.7% of victims in 2010, and 95.0% of victims in 2020), while the perpetrators were mainly men (accounted for 89.9% of perpetrators in 2010, 88.9% of perpetrators in 2020). Moreover, in 2010, 16.0% of the news stories mentioned the perpetrators' history of violent behavior, and 9.2% of perpetrators in the news stories were under the influence of alcoholism. In 2020, the most frequently mentioned personal history information of perpetrators is also violent behavior and alcoholism, which were both mentioned in 5.1% of the stories. Finally, whether in 2010or 2020, little personal history information on the victims was provided in IPV reports.

Research Question 2 also cares about how these contextual features changed between 2010 and 2020. As Table 4 stated, the percentage of IPV incidents involving verbal violence increased from 11.2% in 2010 to 17.1% in 2020 (chi-square=4.6, p<.05). Meanwhile, the proportion of IPV stories that addressed emotional violence rose significantly from 13.2% in 2010 to 21.6% in 2020 (chi-square=8.0, p<.05). However, the percentage of reporting incidents involving economic violence showed a downward trend from 3.7% to 0.5% (chi-square=5.5, p<.05). As for reasons behind the IPV incidents, the proportion of IPV incidents explained by the perpetrator's new romantic decreased remarkably from 12.5% to 4.0% (chi-square=6.0, p<.05), and the percentage of incidents involving jealousy also decreased notably from 13.6% to 5.1% (chi-square=5.6, p<.05). On the contrary, the percentage of incidents caused by fertility-related issues increased significantly from 2.6% in 2010 to 13.1% in 2020. In terms of the consequences of the IPV incidents, the percentage of victims who survived but suffered physical injury and who killed the perpetrators dramatically dropped from 85.5% in 2010 to 76.8% in 2020 (chi-square=4.6, p<.05), and 11.2% in 2010 to 2.0% in 2020 (chi-square=7.9, p<.05) respectively. The even more remarkable change is that the percentage of reporting IPV events ended with the victim surviving but suffered mental injury showed a sharp downward trend from 9.7% in 2010 to 0.0% in 2020 (chi-square=10.4, p<.05). However, the proportion of incidents reported ending with the death of the victim increased substantially from 11.2% in 2010 to 23.2% in 2020 (chi-square=10.2, p<.05). Based on Table 5, the social status of perpetrators reported significantly differed between 2010 and 2020 (chi-square=8.4, p<.05). The percentage of perpetrators who are not famous increased from 83.7% in 2010 to 95.0% in 2020 (z=2.8, p<.05). Finally, it is noticeable that the percentage of perpetrators' violent history being reported decreased from 16% in 2010 to 5% in 2020 (chi-square=8.1, p<.05).

Table 4. Comparison of Select Contextual Characteristics in Chinese News Coverage in 2010 and 2020

Select contextual characteristics	Percentage of total incidents in 2010 (n=455) %	Percentage of total incidents in 2020 (n=99) %	Difference (chi-square)

The specific type of IPV involved			
Physical	98.5	100.0	
Verbal	11.2	17.1	4.6*
Emotional	13.2	21.6	8.0*
Economic	3.7	0.5	5.5*
Sexual	4.5	5.5	
Reasons behind the IPV incident			
Money	15.2	13.1	
Victim infidelity	2.2	0.0	
Alcohol use	13.4	12.1	
Drug use	2.4	2.0	
Perpetrator's new romantic interest	12.5	4.0	6.0*
Stress	2.2	5.1	5.6*
Anger	13.0	14.1	
Jealousy	13.6	5.1	
Face	2.4	2.0	
Relationship between mother-in-law and daughter-in-law	4.2	6.1	
Feudal superstition	0.9	0.0	
Fertility	2.6	13.1	20.8*
Consequences of IPV incident			
The victim survived but suffered physical injury	85.5	76.8	4.6*
The victim survived but suffered mental injury	9.7	0.0	10.4*
The victim died	11.2	23.2	10.2*
The victim killed the perpetrator	11.2	2.0	7.9*

Note: * $p < .05$.

Table 5. Comparison of Perpetrator and Victim's Contextual Characteristics in Chinese News Coverage in 2010 and 2020

Perpetrator and victim characteristics	Perpetrator			Victim		
	Percentage of total incidents in 2010 (n=455) %	Percentage of total incidents in 2020 (n=99) %	Difference (chi-square)	Percentage of total incidents in 2010 (n=455) %	Percentage of total incidents in 2020 (n=99) %	Difference (chi-square)
Gender						
Male	89.9	88.9		10.3	5.1	
Female	10.1	11.1		89.7	95.0	
Social status						
Public figures	12.5	4.0		9.9	4.0	
Sports stars	3.7	1.0		2.0	0.0	
Not famous	83.7	95.0	2.8*	88.1	96.0	
Personal history information						
Alcohol addiction	9.2	5.1		0.0	0.0	
Drug use	2.2	2.0		0.0	0.0	
Criminal history	2.4	2.0		0.0	0.0	
Infidelity	1.3	0.0		0.7	0.0	
Violent behavior	16.0	5.1	8.1*	0.0	0.0	
Mental disease	2.4	0.0		1.54	4.04	

Note: * $p < .05$.

Discussion and Conclusion

The research found that consistent with the research results of other countries and regions, China's IPV news reports in 2010 used more episodic frames rather than thematic frames. However, by 2020, the percentage of IPV coverage using thematic frames has far exceeded the episodic frames. The IPV reports in 2010 and 2020 have many places in common that deserve attention. For example, compared with other types of IPV, physical violence is dominant in IPV incidents reported. There are also some noticeable changes between Chinese IPV reports in 2010 and 2020, such as the proportions of incidents involving verbal violence

and emotional violence, fertility-related issues has significantly increased, while the percentage of incidents mentioned perpetrators' violent history has dropped.

There is a preliminary indication from prior studies that how the media portray a specific health problem has an important impact on how the public regards it as a public health problem and a social issue, and how society responds to this problem. According to the research conducted here, in 2010, most Chinese IPV reports adopted episodic framing, which focuses on specific IPV event(s), and tends to ignore the broader social context of the incident(s) (Iyengar, 2011). This is consistent with the previous research of other countries and regions (eg., Maxwell et al., 2000; Carlyle et al., 2008), indicating that Chinese IPV reports in 2010 focus on the individual and fail to promote social responsibilities attribution. This may become an important reason why the incidence of IPV events cannot decline (Gracia, 2004). However, this situation has changed in a decade. According to the research results of Chinese IPV reports in 2020, newspaper framing has already been heavily skewed toward thematic framing. Under the influence of these newspapers adopting thematic framing, individuals tend to assign the responsibility of IPV to the whole society, then give impetus to the society to provide a variety of protection services, reform laws, policies, etc., eventually reducing the rate of IPV incidents (Iyengar, 1990).

In thematic coverage, which thematic framing is specifically used is also important. The relative lack of community responses in reports of 2010 may exacerbate the victims' isolation and their inability to receive help. What is worse is that, in 2020, the community responses shown in IPV reports become even much less. Not only that, the percentage of thematic coverage addressed a public health perspective and information on IPV resources also showed a dramatic downtrend. The decrement of references to the public health perspective may hinder the effective prevention of IPV from the social level. Meanwhile, the reduction in the provision of information on IPV resources, such as websites, hotlines, and shelters, has led to more victims being forced to solve their problems alone (Carlyle et al., 2008). In general, the decreasing use of these thematic frames will not be conducive to the treatment of IPV problems. From 2010 to 2020, the only thematic frame with an upward trend in use is the frame that addressed government responses. This may be related to the significant increase in the proportion of Party newspapers that tend to report government responses over the past decade. News media serves as an indicator of the public agenda (Carlyle et al., 2008). The appearance of government responses to IPV in more articles means that these laws and

policies have received greater attention, which may indicate to the government the importance of IPV issues, to promote further positive measures by the policymakers.

The research results of Chinese IPV reports in 2010 and 2020 have many commonalities in terms of contextual features. One of the most notable features reflected in Chinese IPV coverage is that incidents involved in physical violence are extremely dominant in all reported incidents. This tendency to selectively report physical violence incidents can consolidate the view that physical violence is the only IPV type worthy of attention, and the importance of other IPV types, such as economic and sexual violence, are largely ignored, even though they also have a great negative impact on public health. This portrayal of IPV impedes IPV victims other than those who suffer physical violence escaping from the perpetrators and striving for their rights (Stalins & Lurigio, 1995). In addition, although some studies are showing that men and women commit roughly equivalent rates of IPV (eg., Dutton, 2006), this research found that the vast majority of reported incidents were committed by men and victims by women. This kind of stereotyped media image of gender is likely to consolidate the cultural expectations for masculinity and femininity, to affect support for public health approaches to IPV prevention and preferences for criminal justice responses (Scarduzio, et al., 2017). It is also notable that alcohol consumption has been described as one of the common causes of IPV events, and the most frequently mentioned personal history information of perpetrators also includes alcoholism. Alcohol use is an important risk factor for IPV, which may increase the severity of IPV events (Fals-Stewart et al., 2005). Media attention to this key factor may promote individuals to link alcohol use with IPV issue, and encourage government and health institutions to intervene in alcohol-induced IPV incidents.

There are also some significant discrepancies between Chinese IPV coverage research results in 2010 and 2020. Many changes are positive for dealing with the IPV issue. Firstly, in terms of IPV types, the proportion of incidents involving verbal violence and emotional violence that used to be relatively ignored has increased. As previously analyzed, this trend in IPV news coverage may promote public recognition of other IPV forms beyond the physical dimension, to protect the rights and safety of relevant victims to a greater extent (Stalins & Lurigio, 1995). Additionally, the IPV incidents involving fertility-related issues were reported more frequently in 2020. In China, traditional concepts of family succession and son preference have existed for a long time (Bo, 2018). Referring to the experience of other

developing countries (Sabarwal, 2012), fertility-related issues could be considered as important inducements of IPV in China. The increasing attention of the media to IPV incidents caused by fertility-related problems can promote the public to be aware of this specific cause of IPV and promote social intervention in such IPV events. However, there are also some trends in IPV news reporting in this decade that will hinder active social intervention in the IPV issues. Compared with 2010, the proportion of IPV incidents reported in 2020 that ended with the death of victims has dramatically increased, while there was a sharp decline portraying victims as suffering the mental injury. In 2020, there was no report explicitly showing that IPV incidents caused psychological trauma to the victims even though the perpetrators may have committed emotional violence, verbal violence, etc., to them. This trend of reports is likely to promote the public gradually ignoring the psychological impact of IPV, but overestimating the mortality of IPV. In this way, news media not only hinders the victims from obtaining appropriate psychological intervention but also distorts the risk of IPV. The distortion of the risk will intimidate other IPV victims, preventing them from breaking free from violent relationships since they are afraid of being killed by their intimate partners (Carlyle et al., 2008).

Finally, the proportion of perpetrators' violent history being reported decreased. IPV perpetrators as a group may be different from non-IPV perpetrators on certain life history characteristics (Fox et al., 2022). The media's attention to the perpetrator's personal history information may provide a warning to potential victims of IPV and play a preventive role in the IPV issue. The downward trend of mentioning the violent history of the perpetrator will lead to the increasing inability of the media to exercise this function of preventing IPV events.

Limitations and Recommendations

This study has several limitations. There were IPV incidents of great influence across the country in both 2010 and 2020. The "Dong Shanshan Case" in 2010 was an IPV murder with cruel means. The "Fang Mouyang Case" in 2020 was an IPV murder caused by the infertility of the victims. The repeated reports of these events with specific characteristics may lead to the deviation of the samples, to impact research results. In addition, between 2010 and 2020, there was a drastic transition from print to digital media in Chinese journalism. By 2020, a large part of the news has been transferred to digital media platforms. Nevertheless, this

research was based on Chinese print news in 2010 and 2020, which means digital news was not included in the research samples. This may explain the sharp decline in the number of samples collected in 2020. Meanwhile, the lack of digital news may lead to incomplete samples, which probably affects the results of the study. To more comprehensively investigate the portrayals of IPV by Chinese news reports in recent years, it is necessary to further study the IPV news in digital media platforms.

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Chapter 10 - The Other Face of Autism Spectrum Disorder: Addressing the Needs of Adolescent Girls in Diagnosis, Treatment, and Support

Brigid G. Miller, Dr. Bahareh Sahebi

Chapter Highlights

- The difficulty in recognizing autism symptoms can mean lost opportunities for early intervention and support for girls with ASD and their families, who have unique needs, specific risk factors, diverse strengths, and systemic burdens linked to their experience of ASD.
- This paper assesses current research on ASD in adolescent girls, specifically symptom presentation, individual and environmental risk factors, individual and systemic treatment models, and gender specific needs unique to this life cycle transition.
- The purpose of this effort will be to highlight the growing body of literature on ASD during the adolescent years for individuals and families, as well as to examine what is still missing in the landscape of knowledge related to translational sciences that address best-practice diagnostic approach, tailored individual and family interventions, and support services for this subset of the population.
- Suggestions for future directions in translational research focused on best clinical outcomes will also be provided.

Introduction

Autism Spectrum Disorder (ASD) is commonly classified by behavioral symptoms in 2 key domains: (1) social communication, and (2) restricted interests (Hyman et al., 2020). The *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; Text Revision; American Psychiatric Association, 2022) recently updated the diagnosis of autism spectrum disorder to clarify that all the following criteria listed must be present: deficits in (1) social-emotional reciprocity, (2) nonverbal communicative behaviors used for social interaction, and (3) developing, maintaining and understanding relationships. According to data from the National Institutes of Health Interview Survey conducted between 2014 – 2016, 2.43% of 13–17-year-olds in the United States are diagnosed with ASD (Xu et al., 2018).

The Autism and Developmental Disabilities Monitoring Network (ADDM) found that in 2016 about 1 in 145 eight-year-old girls have a diagnosis of ASD, and it was approximately 4.3 times more common in boys than in girls (Maenner et al., 2020). Yet there is dispute about the specificity of this figure. A detailed meta-analysis of 54 prevalence studies found that the actual male-to-female ratio is likely closer to 3:1 (Loomes et al., 2017). Loomes and colleagues (2017) used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to analyze the data and the Hoy Risk of Bias Tool (RoBT) to assess the methodologic features of the 54 prevalence studies. They found that gender bias in diagnosis could be leading to more girls being missed by clinicians or diagnosed late, and thus excluded from the early interventions made possible by an accurate diagnosis (Loomes et al., 2017). Specifically, the authors noted that studies using active case ascertainment methods were more likely to identify female ASD cases than passive studies (Loomes et al., 2017). Further, the diagnostic bias against girls was evidenced by the disproportionate number of girls who do not get an ASD diagnosis even when they score high on measurements of autistic traits (Loomes et. al., 2017).

The potential reasons for ASD diagnostic oversight are examined and addressed by several different studies (Bargiel et al., 2016; Lai et al., 2015). Since research samples largely overrepresent boys (Bargiela et al, 2016, Green et al., 2019) and clinical assessment tools are designed to measure the male ASD phenotype (Estrin et al., 2020), methodological bias may exist in distinguishing between male and female autism symptoms (Estrin et al., 2020). Other scholars have shown that higher functioning girls can display enough social skills to

camouflage atypical behaviors (Lai et al., 2016) or have more subtle symptom presentation, such as staring, whereas boys are more likely to show aggression or hyperactivity (Giarelli et al., 2010). It is argued that girls must often demonstrate other behavior problems in addition to their social or emotional deficits in order to get ASD diagnosis (Estrin et al., 2020).

The concept of behavioral camouflaging is widely discussed in ASD literature (Lai et al., 2017; Estrin et al., 2020; Bargiela et al., 2016). Camouflaging in ASD is commonly described as using social communication skills such as imitation, gestures and conversation skills to obscure underlying and more easily recognized ASD symptoms (Lai et al., 2016). A study conducted by Lai and colleagues (2016) suggested that verbal and executive function strengths are primarily responsible for the ability to either hide behavior that may be less socially acceptable or to imitate or perform in ways that reflect the behavior around them. However, the effort required to mask one's true abilities and consistently imitate the world around them can require significant effort and lead to increased rates of anxiety, stress, and depression among girls with ASD (Lai et al., 2016).

Current ASD literature highlights the benefits associated with a timely ASD diagnosis for adolescent girls including identifying specific needs and treatment strategies (Bargiela et al., 2016), increasing access to support services (Bargiela et al., 2016), reducing judgement of the girl and her parents (Bargiela et al., 2016), and reducing self-criticism (Bargiela et al., 2016). The difficulty in recognizing more internalized ASD symptoms (Lai et al., 2017), coupled with the higher emotional burden and greater risk for internalizing disorders such as depression and anxiety (Solomon et al., 2011), calls for greater understanding of the specific needs of adolescent girls with ASD and their families.

The Impact of Race and ASD Diagnosis

Cultural disparities exist in early evaluation and diagnosis of ASD for Black and Hispanic children (Maenner et al., 2020). The ADDM data from 2016 show that Black children without an intellectual disability are less likely to have an early ASD evaluation and diagnosis (Maenner et al., 2020). According to the same ADDM data, Hispanic children are diagnosed less often than White or Black children. Another study conducted by Berg et al. (2017) demonstrated the correlation between adverse childhood experiences (ACEs) scores and the age at which a child is first diagnosed with ASD, which results in missed early

intervention and support services for the child and family. Intersectionality of race and socio-economic status (SES) also show that White, higher SES individuals are more likely to obtain an ASD diagnosis (Newschaffer, 2017).

Risk Factors for ASD

There is widespread agreement in the literature that ASD has underlying genetic and biological underpinnings and may also be influenced by environmental factors (Mandy & Lai, 2016; Solomon & Chung, 2012; Bai et al., 2019). ASD is considered highly heritable; thus, siblings or other relatives with ASD increase the odds of having the disorder (Kreiser & White, 2013). More specifically, one study looked a data from five countries and found the heritability of ASD is approximately 80% (Bai et al., 2019). A study using twin design found that genetic factors play a "consistently larger role than environmental factors," and concluded that environmental factors are unlikely to account for increased rates of ASD (Taylor, 2020).

Further investigation across epidemiology literature indicates that low birth weight, pre-term birth or birth by C-section are associated with increased ASD risk (Schieve et al., 2014). Parental age may also be a contributing factor, with one systematic review showing that advanced maternal age increases risk of ASD for the baby by 41% and advanced paternal age increases those risks by 55%, while lower maternal and paternal age reduced autism risk by 10% and 20% respectively (Wu et al., 2017). Furthermore, maternal opioid use before and during pregnancy (Rubenstein et al., 2018) and both short (less than 18 months) and long (greater than 60 months) inter-pregnancy intervals (Schieve et al., 2017) are also noted as potential factors increasing ASD risk in children.

Relational Risk Factors for ASD

Delayed Diagnosis in Girls

ASD is often missed in younger females due to factors such as camouflaging of symptoms, resulting in girls being diagnosed later than boys (Giarelli et al., 2010). Researchers have posited that there is less understanding of the female autism phenotype, or the common presentation in girls, among pediatricians, psychologists, psychiatrists, educators, and others (Lai et al., 2017). For example, girls with ASD may show different types of restricted

interests than boys (Antenzana et al., 2019). The stereotype of ASD in boys held by those who work with children could also contribute to the lack of understanding about female characteristics of the disorder (Bargiela et al., 2016), and that higher functioning women and girls with ASD commonly report "pretending to be normal," thus further obscuring symptom presentation (Bargiela et al., 2016). Finally, one meta-analysis noted that higher functioning girls are especially vulnerable to being missed by current assessment tools that do not reflect gender presentation differences (Loomes et al., 2017). Children with higher cognitive ability, verbal skills, and executive function—features typical of female autism presentation—are thought to elude early diagnosis until their symptoms intensify with the increasing social demands of school (Hyman et al., 2020). Furthermore, camouflaging may be less successful as the social expectations of teenagers increase (Estrin et al., 2020).

Effects of Delayed Diagnosis

Early intervention has positive effects in treating ASD and offering support to family members (Dawson, 2012). Children with milder symptom presentation and little or no cognitive disability are likely to realize significant change with early intervention and treatment (Hyman et al., 2020). Later diagnosis means less access to these services and wide-ranging long-term implications.

In the United States, gender norms already predispose females to depression in adolescence (Green, 2019). Adolescent girls with ASD are at greater risk for "internalizing disorders," such as anxiety, depression, and eating disorders (Solomon & Chung, 2012). One study hypothesized that the internal nature of female ASD symptoms was another risk factor in missing the diagnosis given that boys and men typically display ASD externally in the form of aggression or hyperactivity (Bargiela et al., 2016). Yet, a timely diagnosis can counteract these effects. Bargiela and colleagues (2016) found that after accurate ASD diagnosis, women reported higher self-esteem and articulated that understanding themselves led to a greater sense of belonging and less shame. Upon embracing their diagnosis, the women with ASD were able to connect with others in the autism community through social media and other platforms, creating community and social support (Bargiela et al., 2016).

Later diagnosed women are at greater risk for physical, emotional, and sexual abuse, potentially because of their challenges with understanding social cues, recognizing

potentially risky situations, and feeling isolated from peers (Bargiela et al., 2016). Other research found sexual exploitation or victimization in ASD adolescent girls and adult women could be the result of lower levels of sexuality education (Holmes et al., 2019).

Women diagnosed with ASD at an older age report that they often remember feeling conflicted between acting out cultural feminine norms and being their genuine "autistic selves," which could also relate to increased rates of gender dysmorphia and non-binary gender among this group (Bargiela et al., 2016).

Finally, a study on peer victimization (PV), often referred to as bullying, found that adolescents with ASD frequently experience PV, and the effects of specific types of bullying were different with girls than boys (Greenlee, 2020). Girls and women with ASD report more bullying related to friendship and social relationships (Bargiela et al., 2016). The study found that adolescent girls were particularly vulnerable to relational bullying in part due to the complexities of female adolescent friendship (Greenlee, 2020). Girls with challenges such as reciprocal conversation, reading social cues, and understanding literal versus sarcastic meaning can find it difficult to imitate these behaviors successfully (Greenlee, 2020).

Individual Treatments for ASD

Research shows that approximately 70% of children in the United States diagnosed with ASD get treatment for the disorder, with the majority (43%) receiving behavioral interventions (Xu et al., 2016). A small portion, 6.9%, received only medication treatment, and 20% received a combination of behavioral and medication treatments. The remaining nearly 30% of children with an ASD diagnosis did not receive either treatment (Xu et al., 2016). Early interventions are almost universally shown to have a positive impact on treating or mitigating autism effects (Solomon & Chung, 2012).

Treatment for ASD aims to minimize the impact of the autism while building on the child's strengths and potential (Solomon & Chung, 2012). Research has looked at both long-term comprehensive treatment models (CTMs) and more brief, focused interventions for ASD (Odom et al., 2009). Some examples of focused interventions include social stories, prompting, and discrete trial training. One of the most widely used treatments, incorporated in both CTMs and focused interventions, is Applied Behavior Analysis (ABA) (Odom et al.,

2009). ABA methods can be implemented in school, home, and community settings using either individual or group methods, within a structured program to reinforce positive behaviors and measure progress in areas such as social communication, social skills development, and restricted interests (Hyman et al., 2020). ABA principles can be applied to a variety of topics from reciprocal conversation, table manners, social cues, friendship skills, and personal hygiene, among others (InBloom Autism Services, personal communication, 2018).

Traditional psychotherapy techniques such as cognitive behavioral therapy (CBT) can also be adapted to treat ASD children (Wood et al., 2019). In a randomized clinical trial, CBT was modified to include social engagement skills, address the child's special interests, and incorporate parents into the treatment session. The study found that the adapted CBT improved social communication and reduced anxiety in ASD children aged 7-13 years old (Wood et al., 2019).

Physical and Mental Co-occurring Conditions and Treatments

Pediatricians and other clinicians often manage physiological issues related to ASD including sleep disorders, obesity, GI disorders, seizures, or motor disorders (Hyman et al., 2020). In addition, ASD has a high rate of co-occurrence with psychiatric disorders such as ADHD, anxiety, OCD, and mood disorders, among others (Hyman et al., 2020). Pharmacological treatment is common for addressing symptoms such as inattention, hyperactivity, impulsivity, aggression, depression, and anxiety (Hyman et al., 2020). Research samples on medication treatment for ASD often include far more boys than girls, for example, in a randomized trial testing two drugs, aripiprazole and risperidone, for effectiveness in treating ASD in children aged 6-17, one sample was 81% male, the other sample was 77% male (DeVane et al., 2019). Methylphenidate is a stimulant commonly prescribed for ADHD-related symptoms in children with ASD, and one analysis of four studies on this treatment found that 83% of the research samples were boys (Sturman et al., 2017).

Systemic Interventions for ASD

Family therapy and other inventions addressing the systemic issues of ASD have been widely reviewed. For example, parallel Swedish studies assessed social skills group training (SSGT)

targeting social communication, social signals, managing conflicts, social rules, and relationship skills (Olsson et al., 2017; Jonsson et al., 2017). Olsson et al. (2017) reviewed a 12-week program and found it modestly effective. Jonsson et al. (2017) studied a similar but longer 24-week program and found significantly more improvement. Both the Olsson et al. (2017) and Jonsson et al. (2017) studies included parental involvement, but Jonsson and colleagues noted that the role of parents in the program warrants further research (2017). The Jonsson et al. (2017) study on the longer program specifically noted positive outcomes for female adolescents; the authors posited that girls did better with the approach because they could potentially sustain longer training intervals. Olsson and colleagues (2017) also highlighted that their study was one of the first to specifically report on gender differences in treatment outcomes, and the lack of overall female inclusion in previous research.

Benefits of Family Therapy

Family therapy is particularly suited to provide comprehensive support for parents and siblings living with children with ASD (Solomon & Chung, 2012). Among other benefits, family therapy can facilitate work on healthy relationships, provide support during periods of high stress, and focus on "action, meaning and emotion" in the families of ASD (Solomon & Chung, 2012). Research has examined specific models of family therapy, for example, when looking at ABA for the individual combined with structural family therapy (SFT), one study found that SFT was helpful for direct caregivers and had positive outcomes for the parent-sibling relationships and marriages in families with ASD (Parker & Molteni, 2017). It was useful for addressing issues of family boundaries, family disengagement, family enmeshment, role clarification, and increased support for direct caregivers that are particularly applicable to ASD families (Parker & Molteni, 2017).

Narrative therapy can help families collaborate and reframe their experience with ASD (Romney & Jones, 2020). Parents and siblings deal the myriad stressors associated with ASD as well as the emotions of shame, loss, and distress. Narrative therapy can help foster family unity and re-create the story of ASD to promote strengths and generate meaning that is not focused solely on their challenges (Romney & Jones, 2020).

Solution-focused brief therapy (SBFT) is a systemic intervention that emphasizes collaborative goal setting (Parker et al., 2020). One case presentation highlighted an

adaptation to the SFBT method to better address needs of ASD families (Parker et al., 2020). They noted that SFBT can help foster empowerment and optimism in families coping with ASD, and that the strength-based approach of SBFT helps counter the mental effects of treatments like ABA that focus on the negative aspects of ASD and its attendant struggles and challenges (Parker et. al., 2020). Related research shows that when a couple parenting a child with ASD focuses on positive support interventions, they also report greater relationship satisfaction (Ekas et al., 2015).

A key component of systemic work with ASD is psychoeducation for parents (Solomon & Chung, 2012). Research shows that improving parenting self-efficacy (PSE), or the measure to which parents feel competent in their abilities to effectively parent, leads to positive outcomes such as decreased parental depression, higher satisfaction, and better coping skills (Jones & Printz, 2005). PSE is also shown to increase child psychosocial development, as children learn to attach meaning to themselves and others by observing their parents (Jones & Printz, 2005). Zhou et al. (2107) created and implemented a family-focused psychoeducational therapy (FFPT) model for ASD families. This group intervention is designed to provide social support and increased capacity for managing the needs of an ASD child. Its goals are also to decrease anxiety and depression and improve the parents' overall perception of their situation. The study found FFPT substantially improved parenting self-efficacy, anxiety, and depression, with these gains holding steady when measured one month after the group ended. The study supports a common theme found in research that family gains and social support translate into more positive outcomes for the parents as well as the child with ASD (Zhou et al., 2017).

Sexuality and Reproductive Health

Adolescent girls with ASD have unique needs related to puberty and sexuality, for example, one study reviewed a parent-led social story intervention to teach menstrual care skills (Klett & Turan, 2011). Mothers were provided structure for teaching specific menstruation concepts and a framework for discussion of body hygiene during puberty. The study found the intervention provided an opportunity for more sexuality education at home and facilitated instruction about overall personal care skills (Klett & Turan, 2011). The mothers reported satisfaction with the approach specifically that it generated conversation about a topic that can otherwise be difficult to discuss in the detailed fashion a girl with ASD may require. The

study authors noted, however, the lack of empirical research on the effectiveness of social story interventions to date (Klett & Turan, 2011).

Helping parents' foster conversations about sexuality in ways that will be effective for their daughters with ASD is critical as the research is clear that girls with ASD are at higher risk of sexual abuse or exploitation, and this risk can be tied to ignorance about sexual health (Brown-Lavoie, 2014). A study on family sexuality communication for adolescent girls with ASD found that parents most often relied on discussion to educate their daughters on reproductive and sexual health topics (Holmes et al., 2019). They did not typically use methods such as ABA-informed visual support or skills-based teaching strategies that could be particularly helpful given that youth with ASD require greater specificity in the nuance of romantic relationships and the details of sexual health (Holmes et al., 2019).

Targeted Cultural Systemic Interventions

Considering the social and cultural context of systemic treatment is essential, and research has considered approaches to tailor treatment to specific client populations, such as one study that looked at an ASD transition program modified for Spanish-speaking Latino families (Kuhn et al., 2020). The program, Juntos en la Transición, was aimed at older ASD youth and their families preparing for adulthood. Families who completed the program considered it more reflective of their social and cultural needs (Kuhn et al., 2020). The authors encouraged using this study to inform replicability of culturally informed group intervention strategies for other aspects of ASD care.

Limitations of Previous Research and Future Directions

One theme found across much of the research on ASD in girls is the limitations posed by samples dominated by boys and men. This unbalanced design is constraining our understanding of the unique needs and underlying process of girls and women with ASD. Several researchers included in this paper echoed this theme, with one citing the "gaps in evidence base, particularly around diagnosis and behavioral descriptions" (Green et al., 2019). In the studies about group social skills training, the first to report about female specific responses to this intervention, Olsson (2017) noted, "research on gender differences in ASD is an emerging field." Another study referenced the lack of research on adolescent girls and

women with ASD, even though they projected that between 70,000 and 111,600 youth with autism turn 18 each year (Holmes et al., 2019).

There are several reasons it is critical to refine our knowledge of the specific ASD characteristics in girls and their needs as they become adolescents and throughout adulthood. Timely diagnosis is essential for obtaining the early intervention and support services shown to be most effective in treating of ASD. Without proper diagnosis, both the girl and her family will not have an accurate understanding of their condition, which can lead to a multitude of negative outcomes related to poor self-concept, frustration, sadness, and isolation (Bargiela et al., 2016; Solomon & Cheng, 2012). Research on the additional emotional burden of consistently hiding one's true personality while camouflaging ASD symptoms could help therapists address the shame that often befalls girls who do not understand their identity. It could also address the symptoms of ambiguous loss and grief that many families experience after ASD diagnosis. This could help the girls and their families learn to view their challenges in the context of other significant strengths, and counteract the messages imbued by a society that most often tells them they do not fit in.

Where do we need to go from here?

Training the Indirect System

Training for mental health practitioners as well as others in the broader medical and education field is also an area that calls for increased focus. As noted, family therapists are particularly well equipped to address the broad systemic implications of an ASD diagnosis and the needs of adolescent girls who can benefit from group social support. Yet most graduate level mental health related programs do not include ASD assessment and interventions their curricula (Parker & Molteni, 2017). The American Association for Marriage and Family Therapy (AAMFT) and the American Psychological Association (APA), among other professional organizations, could require and provide continuing education and development for professionals who work with ASD clients.

A clinical report published in the journal *Pediatrics* emphasized that the needs of ASD patients and their families is a key area of professional development for pediatricians (Hyman, 2020). Additional studies on how to train primary care providers, mental health clinicians, teachers, school counselors, speech therapists, and occupational therapists to

recognize the nuance of female adolescent presentation accurately could be an important step in funneling the proper clients to neuropsychological testing. Many families may not make it to a mental health professional on their own, so ensuring that frontline members of the system are prepared to not only refer but respond to the needs of these girls is vital. An integrated system of care standardized across multiple disciplines and professions would benefit these girls and their families.

The Impact of Socio-cultural Factors and Intersectionality

There is also abundant need for research to understand the intersectionality of race, ethnicity, gender, and socio-economic status in both the diagnosis and effective treatment of ASD. Black families are underrepresented in autism research (Shaia et al., 2019) and one study noted that Black families cite the stigma that exists around ASD in the Black community as a barrier to participation in research (Shaia et al., 2019). For adolescent girls, studies about the compounding effects of their social location with the emotional burden of ASD would be important for social scientists and clinicians alike. For example, how can a therapist help a family whose culture places a high value on female deference learn to manage a teenage girl with ASD who has a propensity for independence and eschews traditional gender norms? How do ASD adolescents process gender identity questions in families with conservative religious or political beliefs? How does any social movement such as the Black Lives Matter movement resonate with adolescent girls with ASD who have more limited ability for perspective taking and understanding of social communication?

Aging and Women with ASD

The needs of females throughout their lifespan have significant future research potential given the dramatic changes in diagnosis rates over the last several decades. Only now will there be a large pool of older women who were diagnosed with ASD during childhood. This will enable researchers to look at questions about how the needs of the girl transition to the needs of the adolescent, emerging adult, mother, romantic partner, professional, and senior citizen. Some studies have started to assess the brain of aging ASD patients, but how is this different for females across the lifespan? Does menopause present a significant neurological milestone? Do early diagnosis and intervention have long-term impact measured in women at

advanced life stages? How is sexual harassment, consent, and the #metoo movement communicated effectively with ASD women?

Empirically Informed Systemic Interventions

Finally, there exists a clear demand for more empirical research into the systemic interventions for ASD treatment. One review of 37 family therapy intervention studies found that none of them used random clinical trials to measure the efficacy of treatment (Patrini, 2017). There is also no empirical research on the effectiveness of narrative therapy with ASD families (Romney & Jones, 2020). To ensure that ASD treatments are effectively integrated into graduate programs as well as clinical practice, there must be a foundational research base on the effectiveness of a systemic approach. In addition to mental health practitioners, teachers and educational organizations can require and provide similar training and professional development for educators so that they can have more background on symptom presentation and unique needs of girls.

Qualitative research could also help clinicians understand the parental motivations and other influences that factor into the family dynamic of girls with ASD as they grow into adolescence. For example, does access to positive parenting role models, such as ASD parent communities for different age groups, provide a helpful benefit? What psychoeducation materials might help impact parenting style, particularly to help caregivers see hope in their situation? As the child grows into late adolescence, what systemic interventions can be specifically tailored to parents of ASD girls as they help their child embark on young adulthood?

Conclusion

Most practicing marriage and family therapists will encounter a client, couple, or family affected by ASD. The unique characteristics, challenges, and strengths of girls with ASD should be an important focal point of research given its wide-ranging systemic implications. Better understanding of the best practices for research-based, culturally relevant care will also enhance joining and alliance building within the ASD family context. As our society continues to evolve in understanding and acceptance of neurodiverse individuals this research can serve as a benchmark for improving the lives of these strong and resilient girls.

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SECTION II - STUDIES ON EDUCATION SCIENCES

Chapter 11 - Repurposing Video Games as Discussion Tools

Joshua M. Patterson

Chapter Highlights

- Numerous video games marketed entirely for entertainment purposes, also known as commercial, off-the-shelf (COTS) titles, can serve as an effective tool for teaching students complicated skills such as executive functioning, hypothesis testing, and critical analysis within the confines of a virtual venue.
- In this phenomenological case study, I outline a pedagogical approach that harnesses the trinity of content knowledge, discursive prowess, and video game aptitude by capitalizing on pupils' preference for digital integration.
- Video game titles were selected according to their scores on Rice's (2007) "Video Game Higher-Order Thinking Evaluation Rubric" and "Video Game Cognitive Viability Scale," with lessons tied to Florida's Next Generation Sunshine State Standards for social studies.
- The implication of this study is that COTS titles offer an alternative curricular entry point, which can elicit higher-order discussions when paired with pointed, teacher-led inquiry.
- This methodology, if properly harnessed, could transmit subject manner more effectively and create critically reflective, game-based learning cohorts.

Introduction

Prior to the 21st century, discussions surrounding digital gaming were frequently sensationalized by media outlets as behavior associated with addiction, sexism, violence, isolation, obsession, and mindlessness (Squire, 2004). As a result, the educational research community has primarily elected to disassociate itself from the controversial practice, ignoring the conspicuous connections between the long tradition of paper-based games and simulations utilized in social studies classrooms (Fisher, 2010). Nevertheless, numerous video games marketed entirely for entertainment purposes, also known as commercial, off-the-shelf (COTS) titles, can act as an effective tool for teaching students complicated skills such as executive functioning, hypothesis testing, and critical analysis within the confines of a relaxed virtual venue (Gee, 2005). COTS games, while brimming with technological affordances, have yet to be earnestly studied in classroom contexts. This paper proposes an alternative method for teachers and students to meaningfully explore critical social studies themes by using open world simulation games that feature well-researched, three-dimensional environments.

According to the most current National Assessment of Educational Progress (2018), better known as "The Nation's Report Card," only 15%, 25%, and 24% of eighth graders performed at or above the proficient level in U.S. history, geography, and civics, respectively. This score represents no significant change from the previous exam (2014), which begs the following question: How can social studies educators provide inventive opportunities for pupils to interact with state-mandated content and reverse this trend of academic stagnation?

By incorporating virtual, interactive media in the classroom, otherwise known as game-based education, teachers can create an interdisciplinary nexus between social studies content and the cultural correlations present within these titles. Video games have a history of being employed in American school settings as a learning model to frame discussion around authentic tasks and new literacies (Squire, 2004). These activities are virtually revitalized in the form of semi-historical games, which draw upon historical concepts but are not bound to specific times or places (Wright-Maley, 2015). While the emphasis on utilizing mock-ups of reality for academic gains has led to an assortment of digital game-based learning (DGBL) research, I contend that most educators have neglected the expansive social contexts of

classroom communities, choosing to myopically examine individual student's interactions with COTS.

The Entertainment Software Association (2019) reported that four out of five U.S. households own a device used to play video games, amounting to 155 million individuals actively gaming nationwide. This translates to roughly 49% of Americans playing video games regularly, understood as three hours or more per week, with a mean of two players in each participating household. Lenhart et al. (2008) surveyed a diverse cross-section of U.S. teenagers and found that 97% reported being regular consumers of video games, with nearly 50% responding affirmatively to playing a video game in the past 24 hours. I propose that educators harness this enthusiasm for digital entertainment by connecting it to pivotal classroom content that corresponds with the themes espoused by the National Council for the Social Studies (NCSS) and their C3 Framework, designed to prepare learners for college, careers, and civic life (2013a). Pupils should be encouraged through active, reflective participation, ensuring their observations are logged, analyzed, and discussed to stage teachable moments that explicitly connect the game to course instruction, seamlessly integrating the entirety of the learning experience (McCall, 2016).

Barab et al. (2009) declare that video games require students to engage in problem solving, ask insightful questions, adapt to new environments, and reflect on how their decisions affect their goals. The objective of game-based learning is to motivate people to change their behavior, develop skills, or drive innovation, thus allowing the educational institution to achieve its objectives (Burke, 2014). In his dissertation using the turn-based strategy title *Civilization III* (Firaxis Games, 2001) to teach high school world history, Squire (2004) determined that after engaging in discussion tailored around the learning goals of gameplay, student responses promoted greater understanding of social studies concepts, such as reading a map and recognizing the consequences of warfare.

While most authors possess enthusiasm for the prospect of incorporating DGBL into classrooms, Maguth et al. (2015) discovered that most literature on this topic is opinion-based, and the limited classroom duration demonstrates low retention rates, as the data analysis skills rarely transfer to other learning situations. In addition, video games as instructional tools are hampered by the difficulty to decipher substantial findings, as interpretations of important verbiage are skewed or conflicting across research paradigms

(Gaydos, 2015). McCall (2016) upholds that if teachers recognize that these COTS video games function as an interpretation of the past and are treated critically in the same manner as a primary or secondary source, there is great promise for their continued application for instructional methods.

Theoretical Framework

Given that classroom activities occurring outside of the game environment (conversations, research, knowledge sharing) are as critical as the game itself, I incorporated a theoretical model that accounts for both student-game exchanges and student-student exchanges. The neo-Vygotskian cultural-historical activity theory (CHAT) permits researchers to investigate not only the role of the game in the simulated learning experience but also how social structures mediate the classroom activity (Wertsch, 1991).

Since video games have shed much of their former media-driven reputation as the source of "what's wrong with adolescent culture" (Fisher, 2010, p. 26) in recent years, they now appear primed to take center stage as a potentially beneficial resource for education. As Ferdig et al. (2020) advised, educators must consider unconventional approaches to reach students amidst the uncertainty brought forth by the COVID-19 pandemic. With widespread quarantining forcing students to interact with their instructors digitally, teacher-led video game-based lessons function as an engaging, pragmatic resource for families with limited access to technology at home. Aligned with sociocultural theory, CHAT proposes that through a collective transition away from the psychology of the individual in isolation, we can exemplify the richness of how a person constructs themselves culturally, historically, and institutionally (Wertsch, 1991).

While Wertsch applies this broader social outlook solely to cognitive analysis, linguists such as Gee (1996) have been inspired to reinterpret literacy itself, asserting that the ability to decipher or produce printed language serves only in a perfunctory capacity. Instead of simply "assuaging the feelings of people committed to reading and writing as decontextualized and isolable skills" (Gee, 1996, p. 153), Gee makes the case for a more liberating type of fluency with the capability to expand far beyond the classroom setting. The unconscious exposure to lessons organized around "saying-doing-believing-valuing" in a meaningful environment allows for a more critical, morally just discourse.

Video games act as crucial counterparts to Gee's ideology since they inform the user of how they can improve their gameplay and why, putting the player in charge of their level of processing (Prensky, 2001a). Interactive software aligns with these self-regulatory mechanisms to serve as the link between learning and motivation. Since video games principally rely on an anticipatory proactive system rather than reactive negative feedback, they provide an untapped entry point into social cognitive frameworks such as CHAT (Barab et al., 2009). Driscoll (2005) affirms that effective instruction is contingent upon four characteristics: (1) teachers must manufacture engagement through student exploration and reflection; (2) the three-dimensional environment must provide students an opportunity to role-play; (3) teachers must shape proactive, collaborative discussions that employ multiple perspectives; and (4) the simulation must be set in a realistic, authentic context.

The philosophical model known as cultural consensus theory supposes that an external truth exists in the domain under investigation, meaning that learners share common experiences which comprise their reality (Weller, 2007). While consensus theory applies controlled questioning geared towards objective knowledge rather than perceptions, its assumptions are still relevant to open-ended queries dealing with personal beliefs (Guest et al., 2006). Subsequently, I drew upon this collective culture to construct an ethnography of the gaming experiences of my students during and separate from the study.

Research Questions

Educational advantages abound through the harnessing of virtual environments with a collaborative user interface, potentially enhancing pupil retention and overall enjoyment of state-mandated content (Şahbaz & Özköse, 2018). Once educators are outfitted with the prerequisite mastery of teacher-led, game-based instruction, we can encourage students to utilize digital, discursive tools and share their experiences in an authentic, meaningful manner (Zielezinski, 2017). The existing familiarity and enthusiasm adolescents possess towards video games can translate to 21st century learning experiences laden with pedagogical benefits that have yet to be conceptualized. To offer some insight into this academic deficiency, I proposed the following research questions:

1. What are students' perceptions related to social studies content as they engage with video games?

2. In what ways do COTS video games provide a meaningful curricular experience within the social studies?

3. How can a combination of face-to-face and digital discussions harmonize with COTS gameplay to reinforce social studies concepts?

Method

Site and Participant Selection

This study was conducted within a public charter high school setting in the state of Florida, drawing participants from an extracurricular social group known as the video game club, which I have sponsored for the past five years. The organization of gaming enthusiasts is comprised of an ethnically diverse, coeducational cohort of 25 dedicated members aged 14-18 and fluent in English, who typically attend afterschool meetings every other week. Over the course of nine weeks, I met with 14 of these students after school hours for 90 minutes once a week to play a COTS open world video games repurposed for social studies discussion. The following video game-based lessons unfolded chronologically, and students were made aware of the curricular objectives prior to delving into each week's content:

Table 1. Video Game Selection and Learning Objectives

Week	**Game**	**Setting**	**Curricular Content Explored**
Pilot	*Fallout 4* (Bethesda Games, 2015)	Post-apocalyptic Massachusetts	Nuclear proliferation, scarcity of resources, and environmental degradation
One	*Assassin's Creed Origins* (Ubisoft, 2017)	Ptolemaic Egypt	Architecture, symbolism, and religion
Two	*Assassin's Creed Odyssey* (Ubisoft, 2018)	Classical Greece	Mythology and diplomacy/rivalries between city-states
Three	*Assassin's Creed 3* (Ubisoft, 2013)	American War for Independence	Establishing a new world order from the perspective of the other

Four	*Assassin's Creed Syndicate* (Ubisoft, 2015)	United Kingdom during the Second Industrial Revolution	Labor markets, social class, and wealth inequality
Five	*Red Dead Redemption 2* (Rockstar Games, 2018)	Late 19th Century American West	Human-environment interaction and the technological conquest of nature
Six	*Battlefield 1* (Electronic Arts/DICE, 2016)	World War I	The futility of war and the birth of the modern era.
Seven	*Battlefield V* (Electronic Arts/DICE, 2018)	World War II	Propaganda and the "us versus them" mentality
Eight	*Grand Theft Auto V* (Rockstar Games, 2013)	Contemporary California	Ecological diversity and humans coexisting with nature

Participation in this game-based research and the video game club from which students were drawn were both voluntary activities. Pupils' grade point averages ranged drastically, and although the group bonded over their intrinsic love of gaming, they were also motivated by a $5 gift card for each session attended. While some club members were current or former students of mine, I did not incorporate these experimental instructional methods into my classroom teaching. I issued potential participants a copy of the institutional review board's informed consent documentation to inform parents/guardians of my intended research.

As the format of the study followed a different protocol than our club meetings, I set aside the week prior to my official start date to streamline investigative methods such as a prohibitive sample size and inefficient techniques to capture student responses (Locke et al., 2000). This pilot study proved incredibly insightful for me to prepare mentally, pedagogically, and organizationally for the coming weeks of data collection. All participants were provided with

a classroom set of Lenovo N23 Chromebooks with Wi-Fi access, enabling them to maximally participate in the discursive elements of the lessons. While effective for data collection, these devices do not possess the graphical capability to accommodate COTS gameplay, therefore I took command of the lone console and the respective controller. By eliminating the potential for student distraction during the gameplay session, I heightened student attention on the content and accompanying dialogue.

Data Collection

My aim for this phenomenological case study was to attain a holistic understanding of the personal, face-to-face, immediate interactions between my students and this gaming experience. Equal time was allotted to my fieldwork and analysis, as the open-ended methodological design required me to function as a research instrument, with my participants serving as co-researchers who were proportionately responsible for the organic nature of each week's discussion (Janesick, 2004).

My cognitive interviewing strategies included equal parts think-aloud and verbal probing, thereby evoking the imaginative responses of the former with the coordinated dialogue of the latter. These procedures are prototypical, as a think-aloud examination places the emphasis on the respondent, requiring the interviewer to interject minimally, besides "tell me what you are thinking" during extended pauses (Drever, 1995). In contrast, the verbal probing approach necessitates a skilled interrogator who can structure inquiries that compel the participant to paraphrase, recall information, display comprehension, and/or render a confidence judgment (Willis & Schechter, 1997).

Since I aimed to capture the students' perceptions related to social studies content through the verbal and digital dialogue in video games, I supplemented my semi-structured interviews with preliminary questionnaires and field notes (Drever, 1995). These observations of specific instances support my findings and serve as a bridge between my experiences and the reading audience (Wolcott, 1990). Multiple data sources (see Table 2) permitted me to build my arguments through triangulation (Stake, 1995). By enhancing my internal validity through evaluative criteria, I maintained the integrity of my detail-oriented qualitative research (Anfara et al., 2002).

Table 2. Summary of Data Sources and Participant Revelations

Data Collection Source	**Information Gathered**
Student Questionnaires	Individualized baseline knowledge; case-by-case, in-depth understanding of each student's predilections; reflection on participants' unique preferences
Small Group Student Interviews	Precursor information essential for future lesson setup; additional student background data/demographics; reflection on students' insight into gaming
Think-Aloud/Probing Question Discussion Formats	Student retention of content knowledge/thematic social studies concepts; improved interaction between students; enhanced teamwork and technology skills
Slack Backchannel	Informal student dialogue; clarification of murky curricular ideas; upgraded student confidence; digital community-building
Researcher's Field Notes	Researcher reflection; insight into data not initially present; emergent themes; progression of ideas; improved quality of future lessons
Audio-Video Recordings	Capture of the live lesson environment; eye-opening interactions, expressions, and reactions when questions posed; building on previous topics discussed; critical researcher reflection

By designing a data collection unit plan around content standards integral to graduation requirements (i.e., the U.S. history end-of-course exam in Florida), I attempted to cater to the interests of stakeholders while capturing curriculum acquisition through the lens of high school students. Although many school districts' views of students are skewed by the business-like principles of driving test scores as an evaluation of knowledge, educational professionals must learn how to navigate these tumultuous waters without destroying their integrity or damaging their sense of purposes (de Freitas, 2018).

Instructors should strive to incorporate a plethora of palpable frameworks to aid students in their academic maturation, highlighting creative means of engagement to ensure the process does not devolve into a regurgitation assembly line (Vogler & Virtue, 2007). While my findings may inform future research, I acknowledge the limitation of this or any other case study to authoritatively dictate how other pupils will reflect upon, adopt, and utilize video game-based social studies content.

The selection of the games, in addition to the accompanying questions fueling the dialogic discourse, was fashioned according to Rice's (2007) "Video Game Higher-Order Thinking Evaluation Rubric" and "Video Game Cognitive Viability Scale". These metrics calculated critical game components such as the complexity of the storyline, the lifelike nature of the avatar, the presence of dialogue with non-playable characters, etc. Besides receiving a perfect or upper range score on Rice's instruments, all the titles chosen for this study were set in historically and/or geographically accurate open world environments, thereby lending themselves to social studies-themed discussion. To focus the attention of my participants on purely academic pursuits, I elected to control the game's avatar and surveyed predetermined map locations that coincided with the primary/secondary sources accompanying each week's lesson. This decision was further bolstered by the mature ratings of these games, whereby students could engage in unethical choices, as well as the limitation of a single console available for this study.

Each 90-minute session interspersed the primary source investigation with COTS content, which built in a certain degree of student autonomy in terms of what we explored within the digital realm. To maintain a tight thematic narrative throughout the lessons, the virtual environment we journeyed to had to align with a weekly curricular objective, thus limiting our options. A strong sense of the technological, pedagogical content knowledge (TPACK) was required during the collaborative process, since I was always balancing student interests against a ticking clock (Koehler & Mishra, 2009).

The equipment required to undertake this DGBL methodology involves ample preparation. I provided the Microsoft Xbox One console along with the software titles, and audio-visual proceedings of all sessions were documented with a digital recorder and GoPro HERO5 camera. The first, middle, and last week of the case study contained a thirty to sixty-minute preliminary, midpoint, and exit semi-structured group interview, in which I asked the participants the discussion starters located in Appendix A.

After the initial interview responses were documented, the weekly meetings commenced. Participants collaborated in small groups on a higher order thinking task tailored to a primary/secondary source that exemplified the setting of the video game, as well as the overall theme of the lesson. For example, *Assassin's Creed Syndicate* (see Figure 1) serves as a token example for adoption, as it is an open world and a multi-platform title which is

available for classroom integration. Set in Victorian-era London, it explores standards-based U.S. history content designated by Florida's Department of Education as *SS.912.A.3.2*: examine the social, political, and economic causes, course, and consequences of the Second Industrial Revolution. Additionally, the title attained a perfect score on Rice's (2007) video game assessment tools.

Figure 1. *Assassin's Creed Syndicate*. Screenshot by author.

Since the late 19th century afforded humanity numerous modern media advancements, this lesson featured early photographic and cinematic records. This documentation of reality made it possible to stage a comparison of the print-based, archival imagery with the virtual secondary source. During the student-centered discussion, a participant explained that such digital environments "allow you to experience aspects of society that are not available today, for better or for worse."

The open-ended, constructivist theoretical framework undergirding this study created various instances where I had to assist or derail thought-provoking but off-topic discourse. I interpreted the immediacy of each participant's comment based on its correlation to the lesson's objectives, with each tied to at least two Next Generation Sunshine State Standards for high school social studies (Florida Department of Education, 2014; see Table 3).

Table 3. Description of Games used in Case Study in relation to Florida's Next Generation Sunshine State High School Social Studies Standards. Table made by author.

Fallout IV	•SS.912.A.6.11 - Examine the controversy surrounding the proliferation of nuclear technology in the United States and the world. •SS.912.A.5.5 - Describe efforts by the United States and other world powers to avoid future wars. •SS.912.W.8.2 - Describe characteristics of the early Cold War. •SS.912.A.6.6 - Analyze the use of atomic weapons during World War II and the aftermath of the bombings.
Assassin's Creed Origins	•SS.912.H.2.3 - Apply various types of critical analysis (contextual, formal, and intuitive criticism) to works in the arts, including the types and use of symbolism within art forms and their philosophical implications. •SS.912.H.2.1 - Identify specific characteristics of works within various art forms (architecture, dance, film, literature, music, theatre, and visual arts).
Assassin's Creed Odyssey	•SS.912.H.3.1 - Analyze the effects of transportation, trade, communication, science, and technology on the preservation and diffusion of culture. •SS.912.E.3.3 - Discuss the effect of barriers to trade and why nations sometimes erect barriers to trade or establish free trade zones.
Assassin's Creed 3	•SS.912.A.5.10 - Analyze support for and resistance to civil rights for women, African Americans, Native Americans, and other minorities. •SS.912.W.5.5 - Analyze the extent to which the Enlightenment impacted the American and French Revolutions. •SS.912.C.1.1 - Evaluate, take, and defend positions on the founding ideals and principles in American Constitutional government. •SS.912.A.1.7 - Describe various socio-cultural aspects of American life including arts, artifacts, literature, education, and publications.
Assassin's Creed Syndicate	•SS.912.W.6.1 - Describe the agricultural and technological innovations that led to industrialization in Great Britain and its subsequent spread to continental Europe, the United States, and Japan. •SS.912.A.3.2 - Examine the social, political, and economic causes, course, and consequences of the second Industrial Revolution that began in the late 19th century.
Red Dead Redemption 2	•SS.912.A.3.6 - Analyze changes that occurred as the United States shifted from agrarian to anindustrial society. •SS.912.A.3.4 - Determine how the development of steel, oil, transportation, communication, andbusiness practices affected the United States economy.
Battlefield 1	•SS.912.W.7.2 - Describe the changing nature of warfare during World War I. •SS.912.W.7.3 - Summarize significant effects of World War I.
Battlefield V	•SS.912.W.7.11 - Describe the effects of World War II. •SS.912.A.6.4 - Examine efforts to expand or contract rights for various populations during World War II.
Grand Theft Auto V	•SS.912.G.5.4 - Analyze case studies of how humans impact the diversity and productivity of ecosystems. •SS.912.G.5.2 - Analyze case studies of how changes in the physical environment of a place can increase or diminish its capacity to support human activity.

Besides the spoken variety, text-based conversation was facilitated through the digital presentation tool *Nearpod* (Renaissance Learning, 2012), directing participants to consider various perspectives brought to life through the digital landscape. To continue with the *Syndicate* example, after I directed the avatar to one of the many factories employing child laborers, *Nearpod* posed a question to the participants pertaining to the ethical treatment of minors and recorded their textual responses: In what ways does *Syndicate's* depiction of 19th century child labor mirror the conditions described in narratives and documented by daguerreotypes/satirical illustrations? *Nearpod* built in ample opportunities during the lesson for participants to compare/contrast social studies themes illustrated through the video game with primary/secondary sources.

To supplement the 90-minute sessions, data was amassed through two platforms that highlight student voice: *Slack* and *Poll Everywhere*. *Slack* (Slack Technologies, 2013) served as an informal chat platform for students to virtually bond, while *Poll Everywhere*'s (Poll Everywhere, 2007) unlimited characters permitted detailed responses to survey questions and thorough primary source analysis. To maintain a constructive climate, I consulted my participants regarding the route we investigated within the virtual terrain and the resulting direction of the live/text-based discussion. For example, within the artificial biosphere of *Syndicate*, they decided whether to examine the estates of the affluent or spectate at a bare-knuckle boxing event; regardless of their partiality, I steered the conversation towards the cultural fabric that stitched these diverse Victorian settings together.

I provided dialogue templates as needed to guide students' responses toward more disciplined, higher order topics. To highlight the overarching objective of analytical discourse, students were offered sentence starters such as "considering the evidence, it can be concluded that…" and "this quote indicates…" to strengthen their contributions. Lessons were also developed in a hierarchical manner that begins at the base of Bloom's (1956) foundational taxonomic pyramid and advanced to the more rigorous demands at the peak. For instance, during week two of my study, discussions evolved from the primary source identification of a single Egyptian hieroglyph to a symbolic evaluation of the virtual Karnak Temple Complex, with *Assassin's Creed Origins* serving as a secondary source interspersed throughout the lesson.

Red Dead Redemption 2's attention to detail also functioned as a fantastic example of how a

virtual medium can breathe new life into curricular content. The video game's narrative stretches throughout the latter portion of the 19th century, documenting how the American West and its inhabitants were altered in the name of progress. Equipped with a massive map and a graphical engine that features a certain degree of randomization, this COTS title provides an effective entry point to the birth of the modern era. During week six's gameplay session, I directed my avatar inside a magic lantern exhibition without any confirmation as to what would appear on the screen. The in-game moving picture show, entitled "One of the Wonders of the Age", synced up perfectly with our discussion around the plethora of household innovations that emerged because of widespread industrialization. Participants exclaimed that this novelty factor is frequently at the nucleus of the intrinsic replay value built into COTS titles like the *Red Dead* and *Grand Theft Auto* franchises.

All weekly meetings closed with a semi-structured, hybrid (digital and face-to-face) conversation detailing what and how the participants learned, coupled with the revelation of the upcoming game and theme to build excitement. After the nine weeks of classroom conversations concluded and were transcribed, I inspected the textual trends via *Dedoose* (Socio Cultural Research Associates, 2013), a web-based qualitative coding application designed for discourse analysis.

Results

With the aid of an assistant, I transcribed 16 hours of audio captured on a digital recorder and GoPro HERO5 camera, interjecting the video footage as needed to clarify any uncertainties. Once the dialogic session was recorded, I chronologically catalogued the participants' textual and image-based replies captured via *Poll Everywhere*, *Nearpod*, and *Slack*. The final step of this data preparation stage involved scanning pupils' paper-based answers, as many lessons were scaffolded with papers serving as graphic organizers or extension activities. The multiple data formats were then uploaded to *Dedoose*, where they were tagged according to source (e.g., *Poll Everywhere* preliminary survey, *Nearpod* text, field notes, etc.) and corresponding video game title.

While pursuing patterns within the social studies-themed discussions, I turned to Saldaña's (2009) six suggestions for discerning thematic trends: similarity (occurrences happen the same way), difference (they happen in predictably different ways), frequency (they happen

often or rarely), sequence (they happen in a particular order), correspondence (they happen in relation to other events), and causation (one appears to cause another). These indicators supplied me with a foundation to ground my investigation, resulting in the collection of qualitative codes and respective definitions present in Table 4. For instance, participants would frequently relate their memories of a video game's narrative with the content explored in the lesson. As a respondent examined primary source photographs of Indian Residential Schools, he recalled how a Native American character from *Red Dead Redemption 2* struggled to justify peace in exchange for the surrender of his people's cultural identity. By coupling the close reading of text and imagery with the gameplay, students detected the heart-wrenching emotion present in the First Peoples' transition from peaceful living to the prescribed care of early settlers.

Table 4. Definitions of Qualitative Codes

Qualitative Codes	**Description**
Communal Bonding	Participants displayed a social connection by means of the study design
Content Criticism	Participants/investigator critiqued the primary/secondary source selection
Content Overload	The participants found the primary sources too wordy or lengthy and had trouble with the analysis process
Content Uncertainty	Participants expressed a lack of clarity regarding one of the primary sources
Controversial Discussions	The participants did not see eye-to-eye on certain issues and expressed their views in a heated but respectful manner
Experiential Enjoyment	The participants communicated an overall positive experience based on the week's lesson.
Expressing Empathy	The participants placed themselves in the perspective of a historical actor
Independent Investigation	Participants proposed questions or contributed comments that were unique and separate from the objective of the lesson
Memetic Referencing	The participants displayed some connection to meme culture
Multiple Perspectives	Participants responded to a portion of the lesson with an internal struggle while determining their

	position
Non-Social Studies Content Knowledge	The participants related the social studies (SS) content to background knowledge they had acquired outside of SS classes and not through video games.
Off-Topic Socializing	Students employed various platforms to discuss topics unrelated to the lesson
Participant Assistance	Participants provided aid to one another in the form of dispensing content knowledge
Participant Engagement	An allusion to the participants focusing their attention fully on the task at hand
Participant Mortality	Some mention of a participant(s) not being present for one or multiple data collection sessions
Social Studies Content Knowledge	The participants related the SS content being explored to background knowledge they had acquired.
Technological Challenges	An example of my best laid technological plans not coming to fruition, requiring an on-the-spot fix
Time Management	Aspects of the lesson were either cut short or never mentioned due to time constraints
Video Game Content Knowledge	The participants linked the gameplay to previous video game knowledge they had acquired before the lesson
Vivid, Virtual Imagery	The 3-D environment allowed the participants to make better sense of SS content

The resulting codes were compiled according to Creswell's (2005) classification for dividing data into the following themes: ordinary (elements of the study the researcher anticipates), unexpected (surprises not predicted to surface during the study), hard-to-classify (containing ideas that overlap with several themes), major/minor (representing the significant and secondary themes in a database), and interconnecting (linking the themes according to a sequence of events). Although much of what I predicted to occur in this study did unfold, nuanced qualities of each week emerged organically and unpredictably, often leading to concepts that were challenging to classify.

With 85 uniquely coded documents and transcribed recordings at my disposal, the data easily reached its saturation point according to Ryan and Bernard's (2004) guidelines: the quantity and complexity of data, investigator experience and exhaustion, and the number of analysts

evaluating the data. The findings from these thematic occurrences, which will be outlined in the subsequent section, were in collaboration with a colleague in my dissertation cohort, thereby enhancing the interrater reliability (Shapiro et al., 1995). Additionally, participants were counted individually for the occurrence of a specific qualitative code (Hannah & Lautsch, 2010). To illustrate this point, when a student correctly labeled all the elements of a primary source image (see Figure 2), I cataloged this display of "social studies content knowledge" separately from the pupils who only received partial credit.

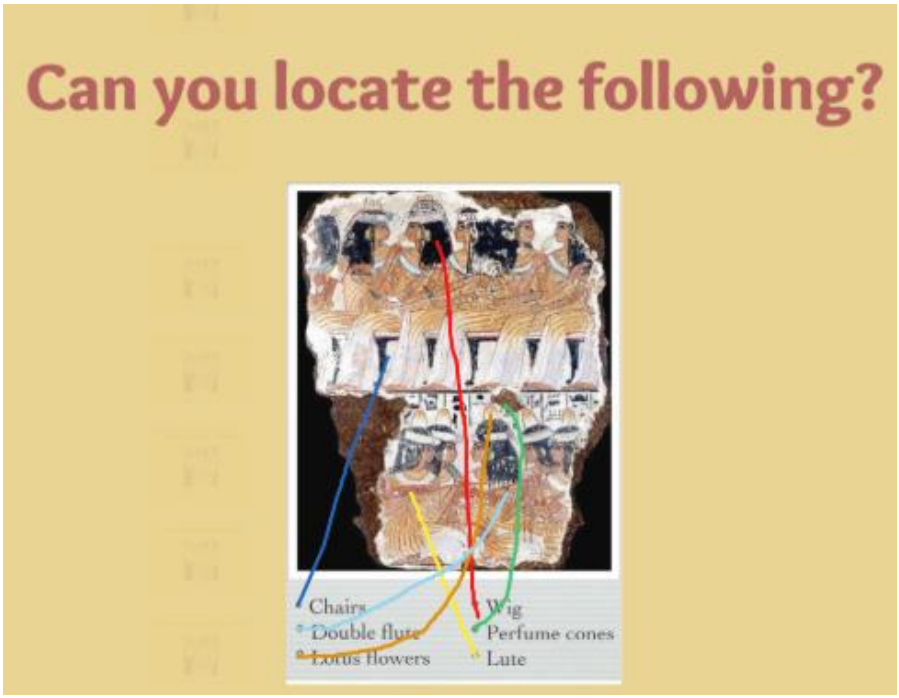

Figure 2. Exemplar of Primary Source Image Analysis. Made by author.

The *Dedoose* software proved pivotal for data analysis procedure, enabling the compilation of a complete list of qualitative code appearances, represented as a word cloud in Figure 3. While visually appealing, I determined the program's capability to compute the highest code co-occurrences to be its most valuable feature. *Dedoose* calculated 23 occasions in which vivid, virtual imagery appeared with experiential enjoyment, indicating a distinct relationship between video game environments and educational stimulation. Equally significant, there were 22 cases of multiple perspectives pairing with expressing empathy and the same number of instances for social studies content knowledge correlating with multiple perspectives. These connections reflect on the study's strength as a tool to impart more inclusive and expressive curricula grounded in primary sources. By exposing pupils to conflicting voices, they are challenged to expose the complexity of the past.

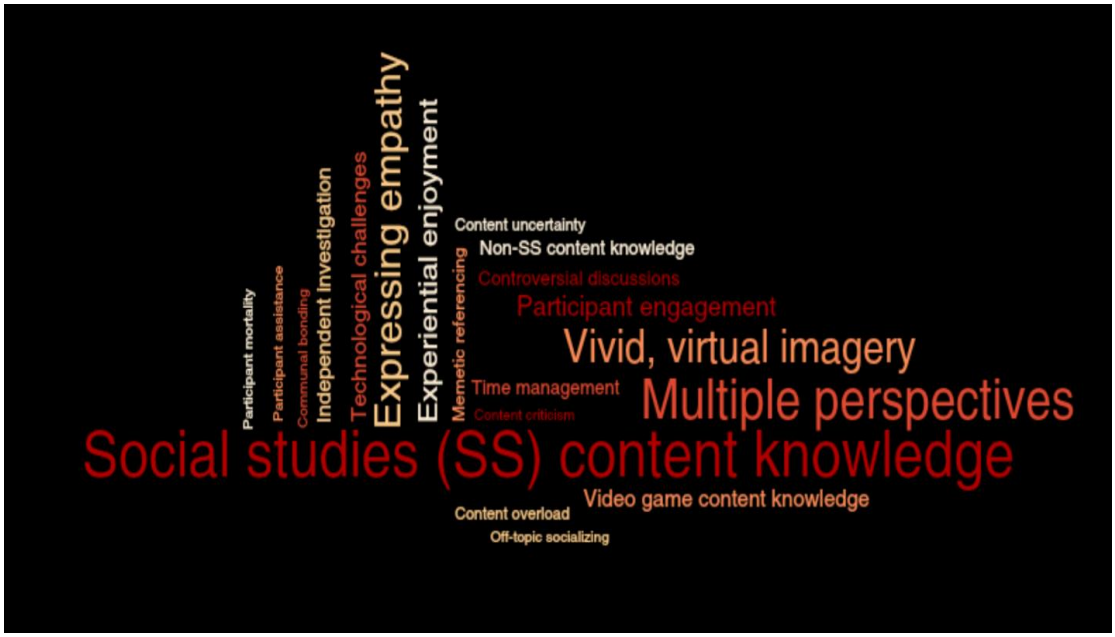

Figure 3: Word Cloud of Qualitative Codes. Created in Dedoose by author.

Discussion

While my findings are not meant to be generalizable, I contend that there may be some emergent, universal themes that transcend student demographics. First, the most frequently appearing code excerpt, "social studies content knowledge," demonstrates that the mature rated video games selected redefine the titles' association with sensationalized violence and obscene language. Video game franchises like *Assassin's Creed* or *Grand Theft Auto* brandished their connection to complex, interdisciplinary subject matter and provide promise as interpretative classroom tools. All titles were tied to Florida's social studies standards (2014), ethically presented, and evocatively connected to historical events. COTS titles like *Red Dead Redemption 2* present educators with the invaluable opportunity to traverse massive, open world environments that recreate historical and contemporary settings.

Although producing pupils more adept in content mastery was never my objective, my findings validate that the participants responded enthusiastically and adeptly throughout the social studies-themed lessons. To demonstrate this unintended upshot, during the fourth week's lesson concentrated around *Assassin's Creed Syndicate,* a participant described the illusion of industrial progress as "frosting" and the glimpse into the factory working conditions as the "inside of the cake." The student explained that while "it looks good on the outside, once you take a bite you realize it is rather bitter and a product of cruelty." As my

avatar traversed through the polluted climate, interacting with adolescent laborers along the way, it became clear that such impassioned student dialogue was at least partially the product of the digital 19th-century manufacturing plant tour I was hosting.

The next three most commonly occurring codes (multiple perspectives; vivid, virtual imagery; expressing empathy) underscore the methodology's ability to provide a platform to investigate historical actors or contentious topics that are usually absent from secondary classrooms in the United States. During our digital expedition into the past, I directed the game's avatar to diverse regions of the map that corresponded with the provocative, primary source-driven dialogue. For example, week two's *Assassin's Creed Odyssey* showcased the societal differences between the city-states of Athens and Sparta. By complementing Xenophon's Athenian critique with a virtual landscape depicting the democratic hypocrisy of slavery, the participants were privy to alternative viewpoints (Kroeker, 2009). Florida's social studies standards (2014) highlight the Classical Greek period as the cradle of Western civilization, but the game's display of vast numbers of enslaved peoples allowed students to connect more compassionately with the complicated roots of democracy.

The last three notable codes (experiential enjoyment; participant engagement; technological challenges) emphasized the varied discussion formats present within the study: polls, written responses, and face-to-face interactions. Although I designed the instructional format to provide equal time to both digital and traditional dialogue to attract different communication styles, I was able to extract more consequential data from the verbal discourse. As one of my students communicated: "Given the limits of *Nearpod,* we can only type 250 characters per entry; when speaking you talk 1000 or more characters, unless you are boring." Another participant also recognized the need to preserve traditional classroom dialogue, admitting that while she may be a swift typist, others may struggle with their writing or prefer to speak their opinions. Since the lessons are heavily dependent on technology, I ran into regular roadblocks which required on-the-spot troubleshooting; I would encourage educators who identify as a video game novice to adapt this methodology to their skillset.

Conclusion

Since I tackled the preconceived limitations of existing student-teacher relationships and technological difficulties in my previous section, I will now focus on the study's

shortcomings annotated during the analysis process. Firstly, student engagement was not always recorded at elevated levels. During the early stages of the study, participants' verbal contributions were limited and more guarded. Discussion was typically driven by their digital, typed responses to my probing questions posed through *Nearpod*. The latter half of the data collection process yielded engrossed conversations, rich in displays of social studies content knowledge and higher-order thinking. Once social barriers were relaxed and the students developed a rapport outside of the research, their collaboration skills improved along with the overall quality of the discourse. I acknowledge that certain demographics may respond differently to my methodology, but these participants grew increasingly more captivated by the lesson design over the course of the nine weeks.

Next, the complications for instructional implementation of this approach prove daunting to overcome. Educators must juggle an oftentimes overwhelming assortment of responsibilities, often being forced to surrender their weekends to grading and lesson planning or counselling students on major life decisions ─ a teacher's workday is never finished. It is therefore difficult to imagine instructors willingly investing their remaining free time to embrace new pedagogical techniques. This methodology requires hours devoted to gameplay mastery, content familiarity, primary source preparation, digital lecture construction, and dialogue rehearsal. It is illogical to expect schools to facilitate the time and budget for the training it would take for educators with inadequate video game experience to execute this discussion-based format with much success. Furthermore, the lessons typically lasted more than 90 minutes, making them challenging to insert amidst the backdrop of standardized testing and curricular demands.

Lastly, macro environmental factors will prevent the support of this instructional design. Regardless of how methods for employing video games in educational settings are described, a percentage of parents and administrators will not support COTS titles with mature ratings. While more video game developers may include nonviolent modes like *Assassin's Creed's* "Discovery Tour," some stakeholders are conditioned to associate the digital activity with malicious behavior (Markey & Ferguson, 2017). Additionally, constricted school budgets may not allow for the equipment expenses. If this classroom practice were accepted more broadly, institutions would ultimately incur added expenditures to host professional development seminars. Although potential for discussion-based, teacher-led gameplay

abounds, I affirm this pedagogical tactic best serves a niche segment of social studies instructors.

Recommendations

Despite this research offering beneficial insight into bridging the gap between education and entertainment, future examinations need to be conducted. To begin, similar forthcoming qualitative studies should increase the number of participants to simulate the average classroom size; this number is capped at 25 students for Florida core classes such as social studies subjects (Florida Department of Education, 2002). While 14 participants procured from a convenience sample proved thought-provoking for the purposes of foundational research, modifications must be made to assess whether this teaching strategy is viable for wider use. It is worth noting that my respondents represent video game enthusiasts, with some admitting to struggling socially and academically in traditional scholastic formats. As an alternative, this methodology may appeal to unorthodox learners, a percentage of whom are medically diagnosed with attention deficit hyperactivity disorder (ADHD). Video games, like *EndeavorRx* which was recently endorsed by the American Food and Drug Administration, may prove effective as therapeutic treatment to boost the concentration of adolescents who struggle with ADHD (Canady, 2020).

Furthermore, additional changes must be applied to my methodology's configuration. Participants voiced their displeasure with the oftentimes verbose primary source documents assigned throughout the nine-week study. For example, it was not necessary to have students preview the entirety of Pericles' funeral oration for fallen Athenian soldiers of the Peloponnesian War to grasp the ethos of classical Greek democracy. To maximize discursive engagement and safeguard the success of the flipped classroom model, future researchers should decrease the textual burden and demonstrate desired conversational practices before the data collection process begins (Cabi, 2018). My earlier lessons were stymied by infrequent participation, as pupils were still adapting to the expectations of my methodology. Fortunately, the teacher-led gameplay enhanced the collaboration, as students willingly exhibited their video game content knowledge in an academic setting.

I would also advise supplementary semi-structured interviews and feedback forms be administered throughout the length of the study. Even though I was able to extract

provocative trends from my preliminary questionnaire and three small group meetings, I could have compiled an even richer data set by issuing an exit survey to each participant and hosting biweekly DGBL gatherings. Additionally, the *Slack* backchannel needs to be reconsidered, as participants displayed only negligible interest in utilizing the platform to converse informally. I would suggest *Discord* as an alternative since the gaming community considers the application its de facto chat method (Anderson, 2019). Further investigation should also be conducted into a live assessment tool with *Poll Everywhere's* unlimited characters and *Nearpod's* collaborative magnetism, thereby eliminating the need for both.

To conclude, I recommend that future educational researchers unite with video game advisors to alleviate potential technological hurdles. With the instructor working in tandem with a gameplay consultant attuned to the pedagogical objectives of each lesson, data collection sessions would run more smoothly, and fresh, open world COTS titles could be repurposed to explore social studies content. Moreover, if this virtual learning technique gains traction, it could improve collaboration between COTS developers and educational entities. To impart a more functional instructional toolbox, colleges may elect to model examples of my methodology for current and prospective teachers. In a forthcoming study unobstructed by budgetary constraints, I would supply small groups of participants with their own console and COTS games, modeling the virtual objectives first then allowing the students to explore the environments on their own. While teacher-led gameplay ensures a certain level of classroom management, the social constructivism undergirding this research causes me to consider the detriment of this curricular control on the learning experience. Although the dynamic nature of video games affords more educational flexibility than a static film or song, passive participation may not be sufficient for students to tap into the full potential of this powerful medium.

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Appendix A

Preliminary Semi-Structured Interview Questions

- How old are you, how many years have you been gaming, and how many hours do you spend gaming each week?
- How do you socialize while gaming? What are some examples?
- Would you participate more in class discussions if you could respond through text? Why or why not?
- Why are video games important to you?
- What have you learned through playing video games? What are some examples?
- What is it about social studies that interests you? What are some of your favourite topics that you have investigated?
- How have you seen social studies present in video games? What are some examples?

Midpoint & Exit Semi-Structured Interview Questions

- What aspects of the experience have you enjoyed? What could have been improved? Any specific examples?
- Did the video games specifically help you learn social studies concepts? How so?
- Was the instructor knowledgeable of the social studies content and gameplay? Why or why not?
- How have you bonded with the other participants during this experience? Any specific examples?
- Were you able to express yourselves better during discussions through texting responses? Why or why not?
- Which game or moment from a game was most memorable for you? Why?
- Do you see this approach to discussing social studies concepts as beneficial? Why or why not? Could this method be utilized in a traditional classroom setting?
- What facets of this approach to learning social studies content would you change? Why?

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Chapter 12 - The Role of Students' Attitude towards Online Peer Feedback in Successful Uptake of Feedback in Argumentative Essay Writing

Nafiseh Taghizadeh Kerman, Seyyed Kazem Banihashem, Omid Noroozi

Chapter Highlights

- Students' attitude towards online peer feedback can predict successful uptake of peer feedback within the context of argumentative essay writing.
- Perceived usefulness and motivation of peer feedback are the two main variables that could predict students' success in uptake of peer feedback in argumentative essay writing.
- Positive attitude towards peer feedback increases the likelihood of providing feedback and also implementation of the received feedback.
- Successful peer feedback uptake is related to how students perceive the received feedback.

Introduction

The role of peer feedback as an effective instructional strategies for writing argumentative essays is reported frequently in the literature (Banihashem et al., 2022; Valero Haro et al., 2019; 2022; Noroozi, 2022; Noroozi et al., 2012). Providing effective peer feedback for students is challenging and students typicaly do not fully uptake feedback from peers (Panadero, 2016; Zhu & Carless, 2018). One challenge is related to students insufficient trust in peers‘ competence to offer quality and constructive feedback (Ghasemi et al., 2016; Kaufman & Schunn, 2011; Zhu & Carless, 2018). According to the literature, students‘ distrust in peers‘ feedback competence can be related to their attitudes toward peer feedback (Allen & Mills, 2016; Taghizadeh et al, 2022; Wu, 2021). Typically, students do not perceive peer feedback as useful as teacher feedback and they have shortend attitude towards peer feedback where they perceive received feedback from peers as no added value (Jiang & Yu, 2014).

Such attitude towards peer feedback can result in distrust in peers‘ feedback skills and subsequently ignoring the received feedback. In line with this, prior studies have revealed that students' perceptions of peer feedback have an impact on how well they do and how much they engage with feedback activities (Collimore et al., 2014). Positive attitude towards peer feedback increase the likelihood of providing feedback and also implementation of the received feedback, while negative attitude towards peer feedback can threaten students‘ active engagement with the peer feedback process and its uptake (Latifi et al., 2020, 2021a, 2021b; Latifi & Noroozi, 2021; Misiejuk et al., 2021; Noroozi et al., 2011; 2016; Taghizadeh et al., 2022). Therefore, students are less likely to apply recieved feedback in their work if they do not perceive peer feedback as a worthwhile activity and do not perceive their peers as qualified and trustworthy feedback providers (Noroozi & Mulder, 2017, Noroozi et al, 2018).

Despite the fact that there is evidence to support the role of attitude towards peer feedback in feedback performance (e.g., Alhomaidan, 2016; Kuyyogsuy, 2019), the impacts of students' attitude towards peer feedback on successful uptake of feedback have not been extensively studied in online learning environments, particularly in the context of argumentative essay writing where critical feedback plays a key role in improvements of argumentation performance in essay writing. Little is known about the relationship between students' attitude towards peer feedback and how well they use peer feedback when they write

argumentative essays in online classes (Alhomaidan, 2016; Kuyyogsuy, 2019). Thus, this study was conducted to further explore and address this issue by answering the following research question: To what extent does students' attitude towards online peer feedback predict successful uptake of peer feedback in argumentative essay writing?

Method

Participants

This study was conducted in five-course at Wageningen University and Research (WUR) in the 2020–2021 academic year. In total, 330 students took part in this study, however, only 284 finished the module. Of this, 32% of participants were male (N=195) and 68% of participants were female (N=89). To comply with ethical standards, participants were made aware of the research setup of the module and their consent was received. Participants were made sure that personal information will be confidential. Additionally, this study received ethical approval from the Social Sciences Ethics Committee of the host university.

Procedure

A module called "*Argumentative Essay Writing*" was created and integrated into the selected online courses at Brightspace. Students were invited to follow this module in three weeks. Students were requested to prepare an argumentative essay on one of the three given controversial topics (week one). Students' original essays were considered as the pre-test. In week two, students were asked to provide feedback on two argumentative essays written by their peers in week two using the platform's embedded criteria. Students were then required to revise their essays (week three). Students' revised essays were considered as the post-test.

Measurements

Quality of Students' Argumentative Essay

The quality of students' argumentative essays was evaluated using a coding scheme developed by Noroozi et al. (2016). The following eight components, which were used in the development of this coding scheme, are typical of high-quality argumentative essay writing (e.g., Noroozi et al., 2016; Toulmin, 2003): introduction on the topic; taking a position on the topic; arguments for the position; justifications for the position; arguments against the

position; justifications for the position; response to counter-arguments; and conclusion and implications. Each element of the coding scheme is given a score between zero and three (three being the highest quality level). The total points by each student for these components were summed to determine student's overall grade for the argumentative essay's writing. The first and the revised draft of each student's essay were evaluated separately. The inter-rater reliability between the coders (Cohen's kappa coefficient) was reliable (Kappa = 0.70).

Quality of Students' Received Peer Feedback

Based on a review of relevant previous studies, the authors developed a coding scheme to evaluate the quality of students' feedback (e.g., Nelson & Schunn, 2009; Patchan et al., 2016; Wu & Schunn, 2020). The three components of peer feedback—affective, cognitive, constructive—are coded. These coding scheme features were given scores ranging from zero (poor quality) to two (good quality). The total number of points represented the students' overall grade for the quality of the peer feedback. Since each student received two sets of feedback, the overall score for the quality of the peer feedback received was determined by averaging the two sets of feedback. The same two coders participated in the coding process for peer feedback analysis, and Cohen's kappa coefficient results for inter-rater reliability among coders were found to be significant (Kappa = 0.60).

Students' Attitude towards Online Peer Feedback

The authors developed a 19-item questionnaire to evaluate students' attitude towards online peer feedback. Each question on this questionnaire has a Likert scale with five possible outcomes ranging from strongly disagree (1), to strongly agree (5). The perceived usefulness of peer feedback, perceived motivation of peer feedback, perceived trustworthiness of peer feedback, and perceived fairness of peer feedback are the four components of this questionnaire. All four components had strong reliability coefficients (Cronbach = 0.82, 0.80, 0.76, and 0.84).

Analysis

We controlled the impacts of students' education levels and course focus on the correlation between the continuous dependent variables and the independent grouping variable. Students'

success in the uptake of peer feedback was measured via their improvements in essay writing from pre-test to post-test. We divided the students into three groups using a percentile rank measurement: successful students (those whose progress in argumentative essay writing from pre-test to post-test was higher than the 67th percentile; N = 105, 39%); less successful students (those whose progress was between 33rd and 67th percentile; N = 62, 22%); and unsuccessful students (those whose progress was below the 33rd percentile). Based on students' attitude towards peer feedback, multinomial logistic regression was used to predict students' success in argumentative essay writing.

Results

To what extent does students' attitude towards online peer feedback predict successful uptake of peer feedback in argumentative essay writing?

The results showed that students' uptake of feedback and improvements in argumentative essay writing can be predicted by their attitude towards peer feedback ($\chi^2 = 15.97$, $p < 0.05$). The perceived usefulness and perceived motivation of peer feedback were the main predictors of students' success in online argumentative essay writing (see Table 1).

Table 1. Multinomial Logistic Regression the Essay Writing Improvement and Students' Attitude towards Peer Feedback

Improvement categories	Students' attitude towards peer feedback		B	SE	Exp (B)	95 % CI for Exp (B)	
						Lower bound	Upper bound
Less successful	Perceived usefulness of peer feedback		0.55	0.40	1.73	0.78	3.82
	Perceived motivation of peer feedback		-0.20	0.37	0.81	0.39	1.69
	Perceived trustworthiness of peer feedback		0.09	0.51	1.10	0.39	3.04
	Perceived fairness of peer feedback		-0.15	0.44	0.86	0.36	2.03
	Course	Course A	0.91	0.70	2.48	0.62	9.93
		Course B	-19.09	0.01	5.08E-9	5.08E-9	5.08E-9

Improvement categories	Students' attitude towards peer feedback		B	SE	Exp (B)	95 % CI for Exp (B)	
						Lower bound	Upper bound
		Course C	0.20	0.62	1.22	0.35	4.17
		Course D	0.08	0.53	1.08	0.38	3.11
	Educational level		0.05	0.25	0.62	0.26	1.54
Successful	Perceived usefulness of peer feedback		0.70	0.35	2.02*	1.04	4.05
	Perceived motivation of peer feedback		-0.72	0.33	0.48*	0.25	0.92
	Perceived trustworthiness of peer feedback		0.18	0.44	1.20	0.50	2.89
	Perceived fairness of peer feedback		-0.00	0.38	0.99	0.46	2.11
	Course	Course A	0.88	0.61	2.41	0.72	8.06
		Course B	-19.26	0.00	4.31E-9	4.31E-9	4.31E-9
		Course C	-0.22	0.54	0.80	0.27	2.31
		Course D	-0.24	0.45	0.78	0.32	1.88
	Educational level		0.05	0.21	0.56	0.62	1.58

Note: Model $\chi^2 = 15.97$; $P<0.05$, -2 log likelihood = 380.29, Pearson $\chi^2 = 364.31$, $p >0.05$; Deviance $\chi^2 = 377.51$, $p > 0.05$; Pseudo R^2 (Cox and Snell =0.08, Nagelkerke = 0.09, McFadden = 0.04). Improvement categories: dependent variable; Peer feedback features: independent variable. The reference category is: unsuccessful

Conclusion

Our findings revealed that students' attitude towards online peer feedback influence their willingness to implement feedback in their revised essay. Successful uptake of peer feedback in the context of argumentative essay wiring was mainly predicted by whether students perceived peer feedback as a useful feedback and whether they enjoyed and became motivated by the received feedback. This indicates that students are willing to incorporate feedback if they pertcieved them useful or if they found it enjoyable and motivating. This result is consistent with the results reported by Misiejuk et al. (2020) and Mulder et al. (2014).

Recommendations

Our findings extend our understanding regarding the relationship between students' attitude towards peer feedback and their feedback implementation. We found that the success in peer feedback uptake is related to how students perceive the received feedback. This suggests teachers should work not only on training students to give quality peer feedback but also should encourage students to have a positive attitude towards peer feedback.

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Chapter 13 - From Sage on the Stage to Host with the Most: Using Entertainment TV Techniques to Deliver Effective Online Learning

Diane Gayeski

Chapter Highlights

- When the COVID -19 lockdown of 2020 demanded that most university professors deliver their courses via synchronous online video technologies such as Zoom, they quickly discovered that long lectures (the sage on the stage model) and even the flipped classroom technique (the guide at the side model) made for awkward interactions and dull experiences.
- They needed to re-think the way they designed and delivered content. Although institutions have resumed on-campus classes, the digital transformation and its demands on faculty will continue.
- Administrators, professors, and students now recognize the power of blending in-person and synchronous and asynchronous online learning, and there is heightened interest in employing this mix of modalities to improve educational access and success.
- Re-designing courses to incorporate these new modalities requires time and skill; thus, professors must learn to efficiently design and deliver online learning that can leverage the affordances of the new delivery platforms.
- Much can be learned from the techniques employed by entertainment TV producers and hosts.
- This paper presents several tools, concepts, and techniques drawn from television producing that have been successfully employed by faculty members at a variety of types of higher education institutions and across many disciplines.

Evolving Models for College Teaching

Driven by pressures to attract and retain a broader profile of students, minimize expenses, and deliver engaging and inclusive learning experiences that produce measurable learning outcomes, the demands on university faculty have been dramatically increasing over the past decade. The teaching model used by many college professors has been evolving from the "sage on the stage" lecturer to the "guide on the side" facilitator of active learning experiences fueled by ongoing research and the availability of more faculty development opportunities (King, 1993). Traditional lectures have been largely replaced by devoting classroom time to discussion and application based on content that students would read or watch beforehand on their own schedules.

The stresses on faculty were magnified by the COVID-19 pandemic of 2020-2022 which forced most of them to move their classes almost overnight to a virtual environment that reduced their presence to pixels on a screen and precluded many techniques they had been using in a classroom or lab space. Reflecting on the experience of professors during this time of "emergency remote teaching" (Hodges, 2020), there was a shift from viewing oneself as a lecturer to being a content creator of support materials and an information manager during live online sessions (Henrickson, 2020). Teaching on camera was now much more like being a television host while also juggling the technical roles of a live studio crew, and creating prerecorded materials placed faculty in the role of television writers and producers.

While most institutions have resumed on-campus classes, this digital transformation and its demands on professors will likely continue, and "this moment is likely to be remembered as a critical turning point between the 'time before,' when analog on-campus degree-focused learning was the default, to the 'time after,' when digital, online, career-focused learning became the fulcrum of competition between institutions" (Gallagher & Palmer, 2020, p.3). Digital transformation or DX involves not just adding technology to deliver and manage courses, but more broadly shifting the culture and the workforce to make the institution's value proposition more obvious (Hayhurst, 2022).

The default modality for most courses and degrees that were designed to be offered online has been asynchronous (posting materials on a course platform for students to access on their own schedule) because it increases the potential student population and addresses different

learning styles and pacing needs. However, synchronous delivery with tools like Zoom should not be discounted merely because it requires simultaneous presence of students and faculty, and because most of our experience with them has been in the context of "emergency" instruction which was obviously not ideal. Students in well-designed synchronous "live" classes often report greater satisfaction than those in asynchronous courses because they perceive that they are being given more feedback and opportunities for natural interaction with their professor and classmates (Fabriz, 2021). This modality is also useful for students who have difficulty with time management because the schedule is fixed and they cannot procrastinate.

Online learning presents challenges because of the lack of shared physical spaces for building community and engaging in hands-on activities, as well as the physical fatigue of fixating on a screen for many hours a day – popularly referred to as Zoom fatigue (Lee, 2020). Many professors found that even their most effective in-person class sessions were not as well received when delivered online (Burke, 2020; DeWitt, 2020).

The typical solution that was recommended by faculty development professionals and implemented by professors is the "flipped classroom" approach of having students watch prerecorded lectures on their own time and using live online meeting times for coaching, application, and discussion - a technique that has become quite popular in both on-site and online learning for the last decade (Tang, et al., 2020; Fogg, 2020). While this "guide at the side" model is certainly an improvement over lengthy talking head lectures, it may not be the best approach for fully exploiting new digital platforms.

Motivation and Method for This Study

Many faculty members who have been successful in the move to online learning have employed (whether consciously or not) the techniques of effective television hosts, crews, writers, and producers. This connection is likely more apparent to the author because of her undergraduate degree and professional experience in television production and her doctorate in educational technology. Having designed and taught both synchronous and asynchronous online classes since 1998, she has drawn guidance from her education and the literature in both fields, as well as from designing corporate e-learning for a variety of external clients.
As a former department chair and dean and now returning to the faculty to teach, the author

was interested in providing concrete suggestions to assist faculty who are experiencing burn-out exacerbated by the added demands of having to work in an online learning environment. A recent Gallop poll made this crisis clear: "More than four in ten K-12 workers in the U.S. (44%) say they 'always' or 'very often' feel burned out at work, outpacing all other industries nationally. College and university workers have the next-highest burnout level, at 35%, making educators among the most burned out groups in the U.S. workforce (Marken, 2022).

In the fall of 2021 after most universities had offered extensive online learning for at least two semesters and professors had the time to adjust their course designs to this new modality, the author sought to capture the heuristics that she and other faculty were applying. A small convenience sample of faculty who were publicly sharing successful techniques through articles, conference presentations and blogs, and others who were personally known to the author were interviewed. The "snowball" sample technique was used to expand the pool through recommendations of the initial interviewees.

The author intentionally sought to include faculty members from a variety of higher education settings in the U.S. and Canada: two-year colleges, liberal arts colleges, technical institutes, and universities which included graduate and undergraduate teaching as well as non-credit professional development webinars. Sixteen interviews were conducted over Zoom and recorded to facilitate transcription, and interviewees were asked to approve quotes that could be used for publication and presentation and to provide screen shots or photos that could illustrate their work. Concurrently, foundational research in educational theory and instructional design, professional articles on television production, and current sources such as blogs and faculty development websites focused on online teaching during COVID were reviewed to provide theoretical grounding, concepts and further examples. The following sections of this paper are the result of analyzing and summarizing some of the most promising techniques of planning, staffing, and producing television that can be translated to the design of online instruction. Examples from a variety of higher educational settings and disciplines are offered, including the author's own experiences in teaching in a school of communications.

Creating a Narrative Arc

Television writers employ the concept of narrative arc: the structure, events, and emotional

peaks and plateaus that build viewers' attention and arousal across and within episodes that create the story world. This engagement is often heightened by presenting content that is not immediately understood by the viewer and causes them to be perplexed so that they must pay close attention to the subsequent content. When building the arc, writers decide how to unfold a story with various "acts" and sub-plots that take a viewer across a series of scenes and emotions – from happy to sad or from terrified to amused.

Similarly, a foundational principle in instructional design is to start with the end or "big idea" in mind and to focus on helping students understand a new "world" of content by building mental models and learning a set of foundational concepts and terminology, all which considering how best to maintain student attention and motivation. Designing a typical college course of 15 weeks is not unlike the process of developing a 22-episode TV season. In his book *What the best college teachers do,* Ken Bain (2004) says that excellent professors:

- focus their courses on enabling students to address the big questions in a given discipline
- engage attention by presenting increasingly complex and intriguing questions and problems
- guide, model, and provide feedback so that students achieve success in solving problems, and also develop their meta-skills in critical thinking, expressing their viewpoints and applying knowledge in new situations outside of class.

One can approach the overall design of an online course by considering the questions posed in "The Execution Rule of Four" developed by the TV coaching agency, The Randy Lane Company (2017):

- What is the payoff? What is our intention?
- How are we going to set it up to engage the audience within 10 seconds?
- What is our point of view on the topic?
- Ask what else we can do to make it bigger and to add more layers

Similarly, TV writer Noah Charney (2014) states that most TV shows loosely follow this

template for the arc of the series or episode:

- The teaser – sets up the main obstacle and characters
- The trouble – the basic conflict or desire or problem
- The muddle – a new obstacle in the way of the original strategy
- The triumph or failure – the strategies work or they don't
- The kicker – two minutes at the end showing what has changed

One can easily see how closely these television development techniques align to the well-known model of instructional design, Gagne's Nine Events of Instruction (1963):

- Gain student attention
- Inform students of the objectives
- Stimulate recall of previous learning
- Present the content
- Provide learning guidance
- Elicit performance / practice
- Provide feedback
- Assess learning
- Enhance learning and transfer

Elizabeth Nonas, a recently retired professor of screenwriting at Ithaca College, remarked that given her background as a television writer, she naturally would begin conceptualizing her courses with a narrative arc in mind, similar to the way that she'd plan out an episode of a TV show (Nonas, personal communication, January 5, 2021).

An important concept around student engagement, just as in audience engagement, is "flow", a state of intense engagement where distractions fall away. In learning situations, it requires striking the right balance between anxiety due to excessive challenge and boredom due to apathy and redundant information. Hyla (2015) depicts this using the axes of difficulty and skills, as shown in Figure 1. As courses unfold, successful professors are able to manage the emotional and intellectual states of the students to maximize arousal and learning.

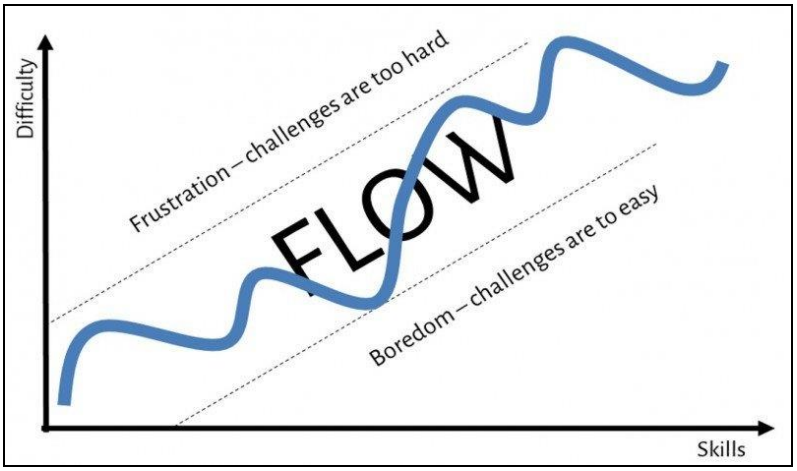

Figure 1. Hyla's (2015) Depiction of "Flow" in Learning Situations

The author has drawn from her background in television in designing her online class on Virtual Teams. The sequence of the course closely follows Charney's (2014) TV show arc and is meant to create the right balance of challenge, anxiety, curiosity, confidence, and celebration.

1. Teaser: On the first day, students watch a compilation of short video clips of corporate leaders who are struggling to make critical decisions about how to re-design their workplaces post-COVID. Students will choose one of these leaders as their client, and their major research papers will revolve around their actual challenges and situations.
2. Trouble: The basic problem to be explored is whether we will ever go back to the old "normal', and how leaders should navigate the myriad of opportunities and pitfalls a hybrid workplace will provide. In this context, students learn research-based concepts about what creates successful virtual teams, and they engage in their own primary research as they engage in interviews, finding that there are still many unanswered questions.
3. Muddles: As the course unfolds, students are required to use an unfamiliar collaboration platform for their projects, and new characters are introduced as they begin to work with their client organizations and the many stakeholders who are involved in the decision-making. This is generally a time of high anxiety and frustration.
4. Triumph: As the course wraps up, the students make formal presentations to their clients who always have positive comments, and we celebrate the achievements of the

students.

5. Kicker: Each student writes a reflection on how this experience has changed their perspectives, confidence, and skills not only in terms of the content they've learned but also in their ability to work with corporate leaders as their clients.

Using "Blocks" and "Rundown Sheets"

Most news and talk shows divide the content into "blocks" that feature different content, presenters, techniques and sometimes locations; a template is created so that there is a standard sequence for each episode. Producers use these blocks to optimize the pace and to ensure that different visual sources are employed and sequenced to keep the viewers' interest. For example, a late-night talk show usually starts with the host's stand-up comedy routine followed by a musical piece and banter with the band host, an in-studio interview with a guest, a pre-recorded feature shot in the field, another guest interview, and finally a wrap-up. Producers use a "rundown sheet" to specify what goes in each block for each show. This document is what the director and crew use during the production to cue up and direct the appropriate content and guests, subtitles, music, cameras, pre-recorded clips, and so on.

Professors teaching synchronous online classes can create standard blocks or segments that will be used in most classes, such as discussions, polls, guest speakers, and short lectures. The rundown sheet reflects those blocks and is used to keep track of time, to make sure they have their visual assets ready to share, and to help assistants know what their role will be in each block, such as taking notes on a digital whiteboard, making sure than an online guest is connected and ready, or to help keep time, as is illustrated in Figure 2 below.

Clock time	**Running time**	**Block**	**Video Source**	**Location** of content	**Notes**
9:55	5:00	welcome	Zoom room	Music Playlist: soundcloud.com/chillhopdotcom	
10:00	2:00	Share-review	whiteboard		Share learning from last week
10:02	1:00	Intro ABC case study	Zoom room		

10:03	3:00	Video clip ABC Co shareholder conflict	Share screen	www.abc.com.news434	Outcue "I never expected to be in this situation."
10:06	1:00	poll	Zoom poll		Did VP of Investor Relations do the right thing? Yes/no
10:07	10:00	Breakout discussion		4 Breakout rooms	Discuss case – focus on role of VP of Investor Relations
10:17	10:00	Report back	Zoom room		Have T.A. capture major points on whiteboard
10:27	8:00	Concepts for shareholder relations	Share screen	Show PowerPoint "investor relations" from Canvas site, introduce guest speaker Harvey Velez	T.A. make sure that Harvey is online and ready
10:35	10:00	Harvey Velez interview	Zoom room		Ask for Q&A after 5 minutes; T.A. monitor chat
10:45	5:00	wrap	Zoom room		Remind them assignment due Monday

Figure 2. Example of a Rundown sheet for a Class Session on Shareholder Relations

Guests, Sidekicks, Floor Directors, and Call Screeners

One of the great discoveries that many faculty members made during COVID was that it suddenly became much easier to invite guests into a class, even on short notice, to explore specific topics or questions. Guests are typically used to present short segments or be interviewed on an area of their current research or professional work, but they can also be used to provide provocative questions or case studies and offer feedback on students' work. For example, in the author's capstone Critical Issues class, an expert panel of alumni and practitioners Zoom in during the first two days of class to share their current work challenges, and this helps students choose topics for their research papers that are relevant and have a

purpose beyond merely fulfilling an academic assignment. Subsequently, panel members are matched with student teams to provide feedback, suggest other people to interview, and recommend sources for additional research.

Incorporating guests and other content sources and techniques into a live class can be technically challenging. Professors are keeping their eyes on the "waiting room" to see if they need to admit guests, they need to create breakout rooms or polls, they are likely sharing their screens and choosing the right computer windows to display, and they simultaneously must monitor the chat window and hand-raising icons next to students' faces to see if students are making comments or want to ask a question. That's a lot to keep track of while also trying to engage in a discussion or present material in a coherent and confident manner!

So that TV hosts can focus on their primary responsibilities, members of the cast and crew play important roles in managing the flow of scenes and people who will be appearing. They can also give the host a break from having to be on-screen and doing all the talking. For instance, most current late night talk shows have a band that creates upbeat transitions between scenes and commercial breaks, and the band leader may play the part of a traditional "sidekick" – the role famously filled by Ed McMahon on the old Johnny Carson show. Floor directors give cues to the host such as time left in a given segment, a countdown before they go back on the air after commercials, and they also mic up and prepare guests so that they are ready to quickly and gracefully get on stage. Call screeners are used when viewers are invited to phone in questions or comments – they decide whom to let on the air, provide them with guidance and rules to follow, and then pass along their names and some critical information about what they will say on to the producer and the host.

Even for professors experienced with their video platform, when class sessions are complex it's a good idea to use a co-teacher or a teaching assistant, or see that some managerial tasks are rotated among the students. To provide a back-up in case the professor's internet connection or computer fails, it's best practice to have one or two other people added in as co-hosts. Professor Luke Keller at Ithaca College has always used a "Learning Assistant" (the Physics Department's title for undergraduate teaching assistants) to help facilitate small breakout groups in his traditional classrooms and he's done the same in his Zoom classes. The assistant can drop into the various online breakout rooms, scans the chat generated by the approximately 90 students in the class, and is free to stop Keller at any point with questions

or comments on behalf of the students who might not feel free to interrupt him (L. Keller, personal communication, January 4, 2021).

In Ithaca College's Park School of Communications "S'Park" introductory course for about 300 first-year students, many alumni are brought in as guest speakers by teleconference. When the class was conducted in person, very few students were brave enough to go up to the classroom camera and ask a question of someone as prominent as the CEO of the Walt Disney Company or the anchor of ABC World News. When the course went online in Fall 2020, a flood of students submitted their questions on Zoom chat. The author, who originally designed and delivered the course, observed one session during the fall of 2021. One of professors took on the role of host and his co-teacher monitored students' postings and called on the students who submitted the best questions, often saying something similar to phrases used by a TV show announcer, such as "Billy Bernstein … come on down!", or "Li Chen, you're up!". The co-professor acted as a floor manager: he made sure that guests were online before their expected appearance, had their cell phone numbers in case they were having technical difficulties, and also communicated via private chat or text message to the host professor with any necessary behind-the-scenes information. He also prevented "Zoom bombing" by approving each student to enter from the waiting room at the beginning of each class.

A similar approach was used by Professor P. Gerard (Gerry) Shaw at Dean College's business program which had been hosting a yearly series of distinguished alumni speakers. When it went virtual in 2021 and students were taking classes from home, he found that many students' parents were also watching, and the audience grew both in size and in their engagement because they could ask questions both "live" on camera and via the chat function. He used an assistant to screen the questions before someone was allowed to ask them on camera. The assistant was often able to combine multiple related questions, as well as to send website links back to attendees via chat to provide more specific information (P. Shaw, personal communication, January 5, 2021).

TV shows use "talk back" microphones and earpieces so that the director can communicate with the crew and on-air talent. If there are multiple presenters in a Zoom session, such as there is a panel of guest speakers or if an assistant is being used to manage questions and content, a mechanism for communicating privately is essential. Most platforms like Zoom

allow people to send private chat messages to each other. Another method is to use text messaging, but then it's obviously important to get cell phone numbers and ask the guests and crew to be ready to check their messages during a session. For instance, a teaching assistant can send a text to remind the professor that there are only 3 minutes left in the class session, or the professor can text a guest speaker to remind her to tell a particular story.

The Warm-up

Television shows typically use some kind of "warm up" which could be a clip from a previous episode or a preview of a critical moment in the current episode to keep viewers from switching away and to pad with some non-essential content while viewers are getting settled. Hosts or stage managers of talk shows also warm up the live studio audience before they go on the air or begin taping, telling them what to expect, and giving them directions like asking them to clap when they see the applause sign lit. Often the host will circulate to get the audience comfortable and in a good mood. Once the show begins, the host will usually engage in some impromptu remarks about the news of the day, and then start enticing viewers with a list of the evening's guests and what they'll be sharing. In instructional settings, this is called an "advance organizer", a tool that helps students get ready for new content by several possible techniques including presenting a cognitive map or scaffolding, offering an enticing preview, or recalling past relevant knowledge.

The start-up minutes of online classes can be awkward, as students and the professor are coming online and not as easily able to engage in the typical kinds of conversations that happen in person. Typical banter about the weather, current news or movies, or one's personal life serves an important role in social bonding and in providing a mechanism for the professor to get insight into students' interests. Ithaca College Assistant Professor of Education Shuzhan Li (personal communication, January 5, 2021) starts his hybrid classes with a "camera sweep", putting the Zoom focus on each student one at a time to greet their classmates and to create a sense of community. He then starts the class with some short prompt to get students talking and in a reflective state: sometimes he will show a photo or play a short *Story Corps* segment (short animated interviews of everyday Americans) and then ask students to react to it.

Professor Luke Keller noted the same awkwardness at the start of his Physics of Sound

course and asked the students (many of whom were media or music majors), “what about a soundtrack?”. They enthusiastically responded with suggestions of songs and playlists, and now he begins his online courses with these, some of which have become signature tunes for the course (L. Keller, personal communication, January 4, 2021).

On-screen Presentation Style and Settings

Professors often cringed when they first saw themselves on Zoom and recognized why professional TV anchors and hosts use sets, makeup, lighting, and flattering camera angles. Susanne Bruyère, Professor and Director of the K. Lisa Yang and Hock E. Tan Institute on Employment and Disability at Cornell University, teaches both undergraduate courses and professional development workshops online. She tries to infuse more animation into her Zoom presentations through vocal variation, she makes it a point to wear professional and colorful clothing with scarves and very obvious jewelry, and she sets up her virtual home office to display books relevant to the topic in the background (S. Bruyère, personal communication, January 22, 2021). Many professors have set up mini-studios that provide better camera angles, sound, lighting, and multiple sources for cues and for presentation. One simple adjustment to make even a “headshot” more attractive is to put the camera on a higher angle by raising the laptop with a box or a few books so that one is looking directly into the camera.

Josh Luckens, an instructional designer in the Learning Innovation & Technology center at Wentworth Institute of Technology in Boston recommends: “First of all, imagine you’re hosting your own interactive TV show. Start by having fun in front of the camera, whatever that authentically looks like for you. Try backing up away from your camera to demonstrate something with your whole body, then come in for a close-up, speaking in a whisper to convey a key point as if it were the most important secret in the world. Stage a memorable prop just off camera that you pick up and interact with at a key moment, like a colorful model of the caffeine molecule in a chemistry course” (Luckens, 2021).

Trent Tucker, Associate Teaching Professor of Business and Economics at Thompson Rivers University, remarked: “I feel like a radio talk show host with my headphones on and desk mic going and I joke with students — ‘hey Diane — you're on the air — what are your thoughts?’. Even do the exaggerated radio announcer voice! I know for me personally, I

watched a lot of YouTube video in Fall Term and I wanted to figure out what makes this talking head video so intriguing I can watch it for 20 minutes." (T. Tucker, personal communication, January 5, 2021).

Home or campus offices can easily be configured to provide a more professional presentation; Figure 3 depicts one example. An adjustable-height desk accommodates two monitors: one for the program content (either the professor's image or the shared desktop content) and the other monitor is for the professor's notes (very much like a teleprompter). In back of the professor is a whiteboard so he can very naturally write down key words or draw a sketch. Having the ability to stand up rather than sit to present content can add energy and variety to a class session. The hosts or anchors of late-night TV shows and network news often open the program with a segment called the "stand-up". David Doss, former executive producer of *NBC Nightly News* stated that a standing anchor leads to a more energized show and that "It's not unique to anchors; people standing up seem to have more energy, vitality, urgency" (Jensen, 2001).

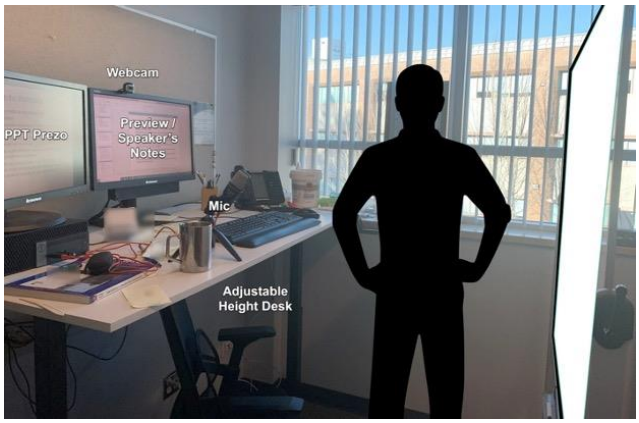

Figure 3. An Office Set-up for Live Video Course Delivery

Some professors have mounted "green screens" on the wall behind them; most video conferencing platforms can replace that color green with some other image that will then look like a backdrop or set such as an iconic scene on campus or the institution's logo. We are accustomed to seeing this technique used on the weather segments of TV news shows where the weather person appears to be standing in front of maps and charts. Many universities have provided stock "Zoom backgrounds" that professors can use to show a campus scene rather than their home or office (see Figure 4.)

Figure 4. Ithaca College Zoom Backgrounds that can be Downloaded

For some teaching situations, having just one camera is not sufficient to show specific content such as demonstrations. OBS (Open Broadcaster Software) is a free open-source application which functions like a switcher (the device in a TV control room that allows the technical director to choose which camera or clip to show on the air, to select transitions such as a dissolve, and to insert subtitles or graphics). Some professors use their laptop camera plus one or two other sources like an iPad or iPhone; the laptop camera can be used to show the professor's "headshot" while the other camera can be focused on some other object or can be used by the professor to walk around a particular space. For example, the technical theatre faculty at Ithaca College used iPads to allow the instructor to walk around a set and demonstrate certain procedures such as hanging lights or operating set construction tools.

Michael Petrillose, Professor and Director of Seminole State College's Hospitality Management program, creates short videos on location at properties in the Orlando area for his online courses. For instance, he records short lectures as he walks through a local restaurant or hotel room, similar to a conventional field trip. He encourages students to visit similar venues and look for the concepts he discusses – giving them credit for posting their observations in the online forum (M. Petrillose, personal communication, January 8, 2021).

Interstitials

In between blocks or programs on television, there are "interstitials" – ads, program trailers, TV station identifications, sponsorship "bumpers", or other clips. While many may feel that these are annoying distractions, they provide important opportunities for viewers to take a break, to learn about related content, and to better understand the programming. According to Ellis (2011, p.90), "In a world of multiple media opportunities, interstitials are little instruction manuals on how to read TV" because they provide important cues about how a channel's producers and executives want their programming to be understood.

Many professors give students one or more short breaks during classes because they find that learning online is much more physically and cognitively taxing than traditional on-site classes. Some use the breaks to provide for some physical movement while still engaging in the topic. Others divide up a traditional lecture with some other modality that stimulates different kinds of responses and insights. Professor Luke Keller, along with colleagues in poetry and music, created short artistic video pieces in a series called "The Effects of Gravity" that he uses as "interstitials" in his synchronous online astronomy course.

Incorporating Audience Influence with Polls and Quizzes

Television shows have found that they can increase audience engagement by using voting and polls; popular shows such as *American Idol* allow viewers to vote for their favorite performer via an app or using text messaging. Twitch, a live streaming platform popularized by gamers, allows its "streamers" (show producers) to create polls which are a way for them to get live feedback from their viewers and to figure out which game they should play next. Most online course platforms have polling and quiz functions built in. Associate Professor of Strategic Communications at Ithaca College Lisa Farman had students watch short lecture videos before class and then answer quiz questions in class, via their cell phones using the online polling software Mentimeter. "It allowed me to see in real-time which areas we needed to review in class that day" (L. Farman, personal communication, January 19, 2021).

Gamification

People are naturally attracted to games, whether they are watching contestants or playing

themselves. Gamification in online courses can include synchronous quizzes that involve the entire class or just a few "players"; there are online templates for electronic slide shows that create quiz questions that mimic shows like *Jeopardy* and *Who Wants to be a Millionaire.* Ithaca College Professor Dennis Charsky created a game in his e-learning course called Food Chain that he adapted from a popular segment by the same name in the sports talk show *Parden the Interruption* where the hosts provide their own rankings of teams and debate their choices. Charsky has student teams come up with rankings about a topic, such as 5 reasons why a company would use e-learning for a particular situation. He reveals all the rankings along with his own to the class, has each team explain their rankings, and then awards points (D. Charsky, personal communication, January 21, 2021).

To get online students acquainted with each other in a more creative way than the standard introductions on the first day, Professor Lisa Farman asked her online students to make short intro videos and watch the videos of their classmates. On the first day of class, she used Mentimeter to run a trivia game about the students in the class. "It was an engaging way for students to learn each others' names and a bit about each other, since they didn't have the ability to go around in a circle in a physical classroom" (L. Farman, personal communication, January 19, 2021). Melody Edwards, an instructor teaching Principles of Management at the University of Central Oklahoma uses Kahoot to require her students to compete with each other by answering actual exam questions in preparation for exams; the top 3 winners are awarded bonus points to their test scores (M. Edwards, personal communication January 20, 2021). In an introductory course on programming, Professor Szymon Machajewski at Grand Valley State University allows students to earn "Peace of Mind" points that can be used to bring up their test grades when they complete certain required or optional assignments (Machajewski, 2017).

One way of developing students' problem-solving abilities is to have them watch others solve a problem while thinking out loud (such as in listening to a contestant on *Who Wants to be a Millionaire* talk through answering a question and then asking a "lifeline" for help and hearing that person's thought process). This technique is used by Professor Aaron Weinberg in his Ithaca College calculus courses; he and colleagues produced a series of videos that visualize complex math concepts using animation. For each concept there is a "Student Problem Solving" clip that shows two students working through a problem out loud. This technique motivates the study of the topic by presenting an interesting problem that is

designed to perturb students by creating a state of cognitive disequilibrium, and it provides an opportunity for vicarious learning as viewers watch the on-camera students talk through their attempt to solve the problem (A. Weinberg, personal communication, January 7, 2021).

Implications for Future Research

Educational technology has a long history of repeating patterns in the adoption of new media. Media producers and professors first use a new medium merely to record or display the current mode of instruction in some new format (Gayeski, 1991; Saettler, 2004). The first educational films were static recordings of a lecture. Early computer-assisted instruction was usually a digitized version of a slide show. Most recently, synchronous online teaching using platforms like Zoom mostly consist of lecturing, showing PowerPoint, and breaking out into discussion groups just as the professors did in a physical class. However, each technology ultimately found its own best format and techniques that could leverage its unique affordances. Films and television now use multiple angles, special effects, editing, and compress events over time or show processes in slow motion. Computer-assisted instruction includes sophisticated analysis of student's answers to questions to provide specific feedback and remediation based on particular misconceptions and allow more advanced learners to speed ahead in the content.

Today, as professors become more familiar with teaching online and videoconference platforms add features, we can expect to see new design and delivery models emerge (Fox, et. al., 2021). More research is needed to see which techniques produce better engagement and outcomes, and how both faculty and student perceptions of online classes change now that we have moved beyond the COVID-19 emergency application of the technology. It will be interesting to document which combination of tools professors use (such as using external polling applications for mobile phones used during synchronous lectures), and how commercial platforms become more robust to incorporate new features (such as Zoom enhancing its whiteboard feature, offering captioning in different languages, and expanding one's choice of display settings). Applications that had been designed for business use are now being expanded to incorporate features that support typical teaching functions. One example is Microsoft Teams version called Teams for Education which is free for educators and students and has features like a collaborative notebook that allows teachers to develop interactive lessons.

Finally, it will be important to assess the effectiveness of synchronous online classes and track student and faculty satisfaction. Administrators and policymakers in higher education are currently struggling to balance affordability, consumer preferences, faculty well-being and retention, and accreditation / evaluation standards. Live online classes can potentially offer many solutions, if designed effectively.

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Chapter 14 - The Opportunities, Challenges and Implications for 3D Digital Designs: Introducing New Toolkits for Pre-Service Teacher Training Courses

Sertaç Arabacıoğlu

Chapter Highlights

- Today's free online software tools offer various opportunities for 3D design, modeling, and digital prototype development.
- However, many teachers do not transfer such opportunities to students' design processes because they are uninformed of such opportunities, are inexperienced with these tools, or are unsure of the difficulties that design projects with such tools will bring for students.
- The purpose of this study was to introduce new toolkits that would make it easier for preservice science teachers to develop 3D digital designs from hands-on models.
- The study presents opportunities, encountered challenges, and potential implications for the integration of 3D designs into school programs to introduce toolkits, considering supporting data from teachers' design experiences.
- The limitations of this study include that the design tasks are discussed on wind turbine blade design and the usage of the Tinkercad online software tool in 3D digital designs.
- The present research, therefore, contributes to a growing body of evidence suggesting the toolkits for teacher education programs and professional development in engineering design practices.

Introduction

Today's free online software tools offer various opportunities for 3D design, printing, and prototype development. Investing in 3D computer-aided design technologies and incorporating them into learning environments is a hot topic among educators, policymakers, community members, and schools due to the numerous pedagogical potentials they have on student learning and understanding of science. Many teachers, on the other hand, do not transfer such opportunities to students' design processes for a variety of reasons, which will be discussed in title “Challenges for integrating the 3D designs into school programs.” Thus, teacher trainers and professional development providers are looking for ways to help teachers cope with these technologies and effectively integrate them into teaching activities (e.g., Cairns et al., 2018; Larnder et al., 2020; Lippard et al., 2019; Mohammed et al., 2019; Trust et al., 2017).

Digital or hands-on, in any case, the design process is mostly a product-oriented engineering effort. For science teachers, who have been educated for a long time with scientific inquiry and the problems and challenges that scientists deal with, thinking like engineers is not an easy task. Furthermore, providing teachers with this form of reasoning in a way that they can effectively adapt to future science classroom setting is a challenging task for teacher trainers. While trying to teach them the design process, you will also need to teach them how to encourage the design skills of their future students, as well as what preliminary experiences and successful pedagogical tools they may use. With such an understanding, the idea of creating these toolkits was arise from an inquiry-based science course, which was basically carried out about the amount of energy obtained due to the blade design of a wind turbine (see Fig. 1, for the activity's test set up). Following that, the toolkits described in this study were designed as a result of the courses that repeats and renews itself during the four training periods.

Therefore, this paper introduces practical and productive toolkits for developing 3D digital designs from hands-on models, in line with the current mainstream studies on teacher development. The first section of the paper synthesizes mainstream studies on 3D design and visualization. To that end, it first describes the analysis of the networks of co-occurrence of important terms extracted from the body of literature on 3D computer-aided designs. Thus, it demonstrates the boundaries of 3D design in education and educational research. As

opportunities for the integration of 3D designs into school programs, it highlights three important points: the pedagogical potential of such technologies on student learning and knowledge building, and teaching curricular subject areas, as well as the enrichment of STEM education and inquiry-based practices. As one of the challenges for the integration of 3D designs into school programs, it then focuses on teacher knowledge and skills and elucidates their learning needs to have considering current studies. Last, considering the future implications of 3D digital designs, the paper describes toolkits for preservice teacher training by addressing an activity called "3D digital design of wind turbine blades".

Figure 1. Hands-on Testing of Turbine Blade Designs.

Theoretical Background

For many years, research on student learning and knowledge construction has helped lay the groundwork to enriched teaching opportunities for 3D digital design tasks. A long time ago, Jonassen (1994, p.35) highlighted pedagogical strategies that made it easier for students to gain knowledge by:

- providing multiple representations of reality,
- avoiding oversimplification of instruction by reflecting on the natural complexity of the real world,
- concentrating on knowledge construction rather than reproduction,
- presenting authentic tasks (rather than abstracting instruction),
- providing real-world, case-based learning environments, rather to predetermined instructional sequences,

- promoting reflective practice, allowing for context and content-dependent knowledge construction,
- and encouraging collaborative knowledge construction through social negotiation rather than competition among learners for recognition.

Many of the ideas listed above might be easily integrated into science teaching and learning through computer-aided authentic practices. Aside from conventional teaching approaches such as textbooks, hands-on models, and pencil drawings, 3D design tasks could provide students with effective learning opportunities. The task of developing 3D digital designs from hands-on models, discussed in this paper, is clearly a visualization endeavor. Because students' ability to design is dependent on both the ability to visualize things internally, in "the mind's eye," as well as the ability to produce exterior visualizations (Chakrabarti, 1995). Visualizing is defined an important engineering habit of mind that an engineer handles an abstract idea and explain the practical solution in a more concrete way (Lucas et al., 2014). In classroom practices, accessible and user-friendly computer-aided design tools (e.g., Tinkercad, Fusion 360, 123D Design, Blender) widely assist in this visualization endeavor through modeling to create dynamic and interactive 3D digital models. Within the context of their pedagogical competence, teachers are knowledgeable about the use of models and modeling in science instruction. As part of the science and engineering disciplines in the curriculum, they frequently provide students with hands-on models and design tasks for modeling. Modeling is considered as an important part of doing science and engaging learners in making meaning of phenomena in science activities (National Academies of Sciences, Engineering, and Medicine, 2009). Engineering practices, on the other hand, could guide design tasks for using models to analyze existing systems, as well as using models to visualize a design and develop it further, to convey a design's characteristics to others, and to test design performance as prototypes (see NRC, 2011; p.57). All of these common scientific and engineering understandings relating to design tasks, visualization, and modeling have now become opportunities for the integration of 3D digital designs into school programs recently.

Opportunities

Integrating the 3D Designs into School Programs

Even though they are not clearly separated, the general orientation of the research in the

literature gives characteristic areas of opportunity for the integration of 3D designs into academic activities. To get a sense of the larger picture, it would be appropriate to give an analysis of research on 3D technology and its variants using a basic level of text mining. In this article discussing technology, it would be welcome to present such a modest analysis. Fig. 2 illustrates the relevant networks of key terms (eg., 3D, 3 dimensions, and three dimensions) in education and educational research. The VOSviewer (see Jan van Eck & Waltman, 2021) was used to show the examination of co-occurence networks of important terms extracted from the body of literature on 3D technologies. The bibliographic data was obtained from the Web of Science database using the keywords "topic: 3D, 3 dimensions, and three dimensions on March 13, 2022." Results were refined for education and educational research in WOS categories. In visualization, the distance between the two terms is approximately indicative of the relatedness of the terms to each other. In general, the closer the two terms are located to each other, the stronger their relatedness. The circles also represent the most important terms in the literature. If the image is interpreted in this sense, it could be said that the literature gives an initial core in terms of design, 3D printing, 3D environment, science education, and science content. And the design process plays a significant mediating role in the relationship between teaching, science content, and 3D printing and the environment.

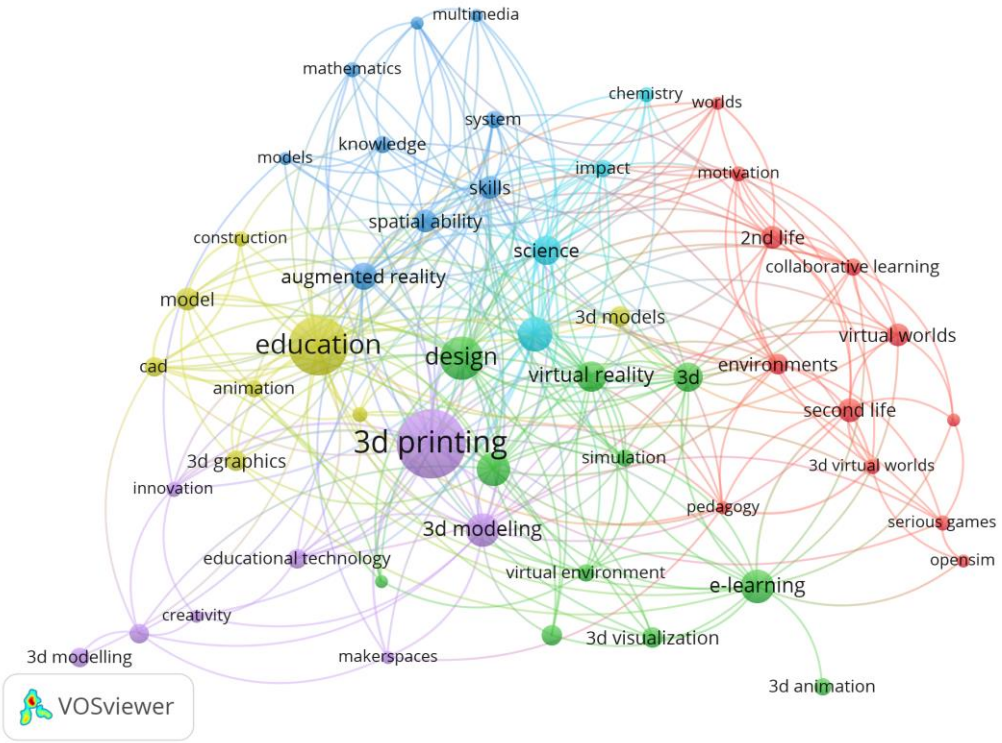


Figure 2. The Body of Literature on 3D Technologies in Education and Educational Research

To this end, despite the fact that they are not divided by clear lines, there are various examples in the literature that illustrate the pedagogical potential of such design tasks and 3D solutions. One group of studies, for example, showed that *design* and *3D visualizations* promote the usage and construction of numerous technologies, including 3D animations, simulations, e-learning, virtual reality, and virtual environments (e.g., Astuti et al., 2020; Bakas & Mikropoulos, 2003; Dolenc & Abersek, 2012; Eriksson et al., 2014; Ferreira et al., 2011; Guney, 2019; Guo et al., 2022; Isik-Ercan et al., 2014; Kim, 2006; Lackovic et al., 2015; Ramey & Stevens, 2019). Another research group has concentrated on *3D printing*, *3D modeling*, or makerspace work areas to address creativity and spatial abilities, etc (e.g., Benzer & Yildiz, 2019, Cairns et al., 2018; Ng & Chan, 2019; Sen et al., 2020; Trust & Maloy, 2017). In a group of studies, the use and development of *3D models* is comprehensively discussed and the knowledge and understanding developed by students in subjects such as chemistry, natural sciences, and biology are addressed (e.g., Kaberman & Dori, 2009; Lucas, 2021; Mithalal & Balacheff, 2019; Suescun-Florez et al., 2013). On the other hand, the environments of *Second Life*, *3D virtual worlds*, and serious *3D games* were frequently used by researchers, especially for provoking student collaboration, motivation, social presence, and so on (e.g., Chen et al., 2014; Cho et al., 2015; el Mawas et al., 2020; Gouseti et al., 2020; Martin, R. et al., 2021; Robertson & Kipar, 2010; Rosmansyah et al., 2019; Sung et al., 2018; Yeh et al., 2018; Xie et al., 2017).

Finally, another set of tools largely composed of *3D virtual models*, *augmented reality*, and similar multimedia applications was used specifically to support student knowledge and skills (e.g., Akilli & Seven, 2014; Bruce & Hawes, 2015; Chaker et al., 2021; Frede, 2010; Halpern et al., 2015; Hsiao et al., 2016; Korniienko & Barchi V, 2020; Minoz-Cristobal et al., 2015; Park & Logsdon, 2015; Shevchuk, 2010; Wan et al., 2018).

Student Learning and Knowledge Building

Clearly, 3D digital designs have been widely used in a variety of environments and at educational levels for over ten years (Astuti et al., 2020; Fujita et al., 2017; Gouseti et al., 2020; Isik-Ercan et al., 2014; Robertson & Kipar, 2010; Suescun-Florez et al., 2013; Trust & Maloy, 2017). Therefore, their benefits for student understanding and knowledge have been studied in various ways. Trust and Maloy (2017) investigated the effects of 3D projects on student learning across multiple grade levels and revealed that these applications promote the

skills of 3D modeling, creativity, technology literacy, problem solving, self-directed learning, critical thinking, and perseverance. As a result of their study with primary and secondary students and teachers, Gouseti et al. (2020) found that the use of digital artifacts (i.e., virtual 3D model exhibitions) provides opportunities for playful learning, enhances motivation and collaboration, and increases student interest. Suescun-Florez et al. (2013) revealed that students gained a reasonable understanding of engineering principles and had the opportunity to apply their math skills and science knowledge in the study, which used 3D printers for activities such as soil permeability and erosion in rivers with elementary school students. In addition, Isık-Ercan et al. (2014) show that by utilizing 3D visualization and generating interactive 3D software activities, young pupils can gain a comprehension of the Earth-Solar-Moon system as well as a viewpoint on using 3D visualizations. Similarly, it has been reported in studies with older students and even university students that 3D visualizations support critical thinking skills and scientific attitudes (Astuti et al., 2020), support 3D geometric thinking (Fujita et al., 2017), facilitate cooperative learning, and improve peer-to-peer interaction (Robertson & Kipar, 2010).

Teaching Curricular Subject Areas

In terms of domain-specific applications in science education, 3D digital design and 3D visualization offer a lot of potential in teaching and learning astronomy. Studies, for example, have focused on the use of 3D visualization software to simulate day and night, moon phases and seasons (Isik-Ercan et al., 2014), the use of 3D simulations to extrapolate three-dimensionality from the night sky (Eriksson et al., 2014), the design of interactive 3D virtual environments to teach planetary phenomena (Bakas & Mikropoulos, 2003), the experiencing of educational 3D video games on Solar System planets and satellites (el Mawas et al., 2020), and the use of interactive 3D models to teach the weather (Hsiao et al., 2016). Unlike astronomy, 3D design and visualization constitute another field of research for the chemistry concepts and theories concerning micro-phenomena. For example, studies show that they can be used to create 3D mobile AR applications for chemistry classes (Wan et al., 2018), teach chemical formulae using a 3D game (Chen et al., 2014), or perform chemistry assessments using 3D models (Kaberman & Dori, 2009). 3D visualization and models have the potential to be used in areas like living dissection and subject animal use, which are often debated as part of animal rights and ethics. Possible uses 3D visualizations such as virtual models of human anatomy (Korniienko & Barchi V, 2020) and spatial representation of musculoskeletal

anatomy (Chaker et al., 2021) have recently received a lot of attention.

Enrichment of STEM Education and Inquiry-based Practices

Regarding the learning approaches, 3D digital designs are widely used as a tool for science, technology, engineering, and math (STEM) education and inquiry-based learning approaches. Related literature discusses potential applications of 3D digital designs and modeling for creating 3D learning environments to cultivate STEAM interest (e.g., using FUSE Studios (Ramey & Stevens, 2019), developing students' computational thinking skills through 3D robot modeling activities in integrated STEM activities (Sen et al., 2020), supporting spatial skills with 3D computer-aided design (CAD) to facilitate STEM learning(Ng & Chan, 2019), and using digital models as a tasks for STEAM approach (e.g., GeoGebra 3D Graphics Calculator) (Haas et al., 2021). As examples of inquiry-based learning applications, studies have examined the effectiveness of experiments based on 3D virtual reality simulations (Kim, 2006), and 3D experiential games (Sung et al., 2018), and reported how students exhibit inquiry-based learning in 3D virtual worlds (3DVW) (Xie et al., 2017).

Challenges

A variety of challenges can emerge in integrating 3D designs into school programs, ranging from access to information technology to financing, from compatibility with learning outcomes to teacher professional development. Among these, teacher development seems particularly critical since they interact directly with students and integrate 3D designs into the classroom environment. Therefore, recent and relevant studies have concentrated on teacher professional development explicitly or within the context of its potential implications (Cairns et al., 2018; Katehi et al., 2009; Larnder et al., 2020; Lippard et al., 2019; Mohammed et al. 2019; Trust et al., 2021; Thomas & Drew, 2022). Existent evidence emphasizes teacher development in a variety of aspects, including thinking like an engineer, having the technological knowledge and competence to bring ideas together in a product, and benefitting from professional development programs. For example, Trust et al. (2021) have examined teachers' understanding and indicated that new technological innovations such as 3D printers have yet to be widely accepted or instructed on in educational settings. They recommend that teacher education programs, schools, and districts focus on providing high-quality professional development opportunities for teachers to discover, learn about, and improve

their TPACK capabilities for innovative technologies like AR, VR, and 3D printing and modeling. According to Larnder et al. (2020), teachers may have a variety of training needs related to technological knowledge, such as improving their ability to use 3D modeling software, getting familiar with the workflow from 3D modeling file formats to recently printed objects, continuous training in digital pedagogy, and using digital devices for pedagogical purposes. Regarding the pedagogical knowledge, Cairns et al. (2018) also argue that teachers should have knowledge and awareness of 3D printing in order to include it in engineering design lesson plans that give rich, authentic contexts for students to experience deep learning. Lippard et al. (2019) also focus on pedagogy and define that it is vital for teachers to gain experience and confidence in the basic needs of good teaching for children to be ready to develop their engineering habits (for example, incorporating children into learning and classroom management).

In addition to identifying teachers' training and development needs, existing studies provide a set of recommendations on effective professional development programs to draw the attention of teacher trainers and professional development providers. As discussed in previous sections, 3D design is indeed a visualization endeavor. According to Lucas et al. (2014), such visualizations are considered as a significant engineering habit of mind. Katehi et al. (2009) state that during professional development programs, teachers who are unfamiliar with engineering may feel anxious, and teachers who do not have a sufficient knowledge of science, particularly math, may sometimes have difficulty understanding the material or may be disturbed by the open-endedness of engineering design. Trust et al., (2021), in addition to the abovementioned, suggests that teacher educators and pre-service and in-service teachers should collaborate to examine literature, best practices, and model lessons for using these technologies in the classroom, as well as to identify and debate potential benefits and uses. As a result, studies recommend that teacher training programs be designed to make greater use of both immersive and modeling environment to better prepare teachers for the needs of the future 21st century classroom (Mohammed et al. 2019).

Teacher Training Toolkits: With Examples of 3D Digital Design of Wind Turbine Blades

This section will discuss and demonstrate useful applications, tasks, various tools, and facilitators that might be utilized with the preservice teachers to enhance their skills and

understanding of 3D digital designs. The sequential steps, which we identify as toolkits for science teachers' professional development, consist of five basic components:

- Toolkit 1: Analyzing the task and setting objectives
- Toolkit 2: Employing hands-on prototypes to clarify design tasks
- Toolkit 3: Identifying the design task's requirements and constraints
- Toolkit 4: Making the transition from physical prototypes to detailed drawings
- Toolkit 5: Converting Two-Dimensional Pencil Drawings to Three-Dimensional Digital Designs
- Toolkit 6: Troubleshooting and reflecting on the finished product

The proposed toolkits are discussed for 38 different project examples, ranging from highly technical to non-technical 3D digital designs on "3D digital design of wind turbine blades". These toolkits were created as part of the course "Current Applications in Educational Technology," which aims to inform and raise awareness of educational technologies for preservice teachers.

Toolkit 1: Analyzing the Task and Setting Objectives

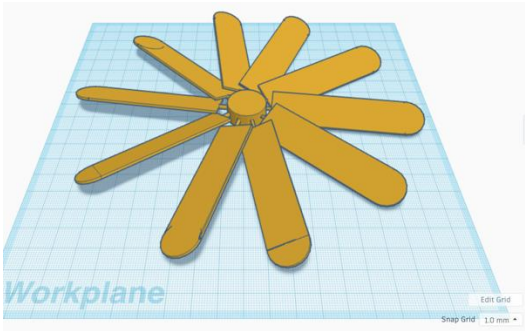
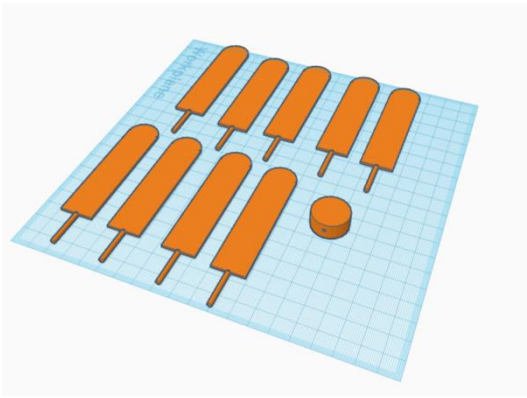
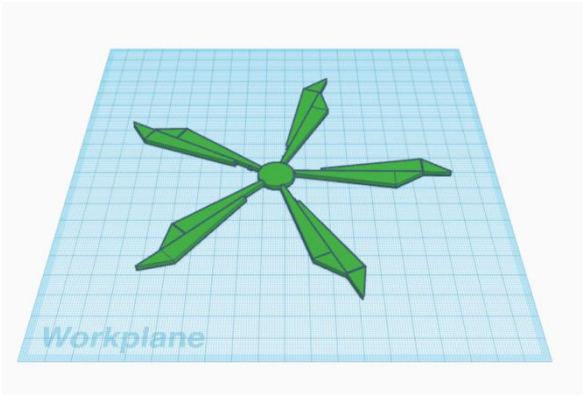
The first toolkit focuses on the objectives of design idea and includes identifying which objectives would be addressed with the design task. The objectives set at this stage define how flexible the preservice teachers could be in the products that emerge at the end of the digital design process, in other words, within the boundaries of the design area. According to Dym et al., (2002), the objectives can help in choosing at least acceptable design alternatives, or, in other words, acceptable designs. Various visualization methods and techniques, as suggested by Lucas et al. (2014), might well be employed at this stage:

- thinking aloud
- mentally rehearsing physical tasks
- modelling
- storyboarding
- using mind maps and other graphic display methods
- using infographics
- using web-based games

During this section of the course, it was expected that the preservice teachers would clearly

describe the objective of the design task. For that, it was made apparent to them that the objective identified in the design task would have an impact on the visualization of the final product. Table 1. illustrates examples of shared objectives and the final 3D digital design of wind turbine blades that emerged.

Table 1. Examples of Shared Objectives

Objectives and Sub-objectives	*The visualization of wind turbine blades*
Objective 1: Visualizing an exact prototype of the final product. • to rehearse and communicate ideas via visual representation of wind turbine blades, • to visualize and develop wind turbine blades further, • and to analyze wind turbine existing blade systems.	
Objective 2: Visualizing raw 3D designs for printing that could be customized to various research questions. • to test predictions to make possible explanations, • to test design performance as prototypes, • to direct reasoning processes for bridging the gap between problem and solution.	
Objective 3: Visualizing semi-structured 3D digital designs for new ideas or proposed systems • to communicate the characteristics of a design to others, • to eliminate uncertainty derived from mental models • to use visual representations to rehearse and communicate ideas	

Informal talks with the preservice teachers made clear that those who followed the second aim planned to use this material in a course based on scientific inquiry when the design was printed. In a sense, although the design seems to be raw, the final product actually serves a much greater purpose than designing a 3D digital object. Another piece of evidence supporting this viewpoint was that those who continued with objectives 1 and 3 considered the process merely a design work, hence they proposed a model that was not adaptable in any way.

Toolkit 2: Employing Hands-on Prototypes to Clarify Design Tasks

The second toolkit focuses on the clarification of the digital design task with physical hands-on models. Hands-on designs are considered models that come closest to fully realizing design goals (Kosky et al., 2021). Hands-on models are necessary to be convinced that the design will work, to clarify basically the challenges involved in manufacturing a product, and to produce detailed designs closest to manufacturing, testing, and final performance. Actually, the use of physically hands-on models is not something that science teachers are far away from. The use of models is an important part of doing science and engaging learners in making meaning of phenomena and therefore teachers often use hands-on models to their practices (National Academies of Sciences, Engineering, and Medicine, 2009). On the other hand, 3D digital design is mostly a visualization endeavor. Visualization is defined as one of the habits of mind that appear to be essential to the way engineers think and act. It includes transitioning from abstract to more concrete, manipulating materials, rehearsing mentally of physical space, rehearsing mentally of practical design solutions, and thinking in three dimensions (Lucas et al., 2014). Therefore, the use of physical hands-on models as a mediator for visualization while transferring design ideas from a mental design or scientific inquiry to 3D digital designs are useful.

During the section of the course, preservice teachers used basic materials such as wooden abeslangs and sticks for rapid prototyping of wind turbine blades (see Figure 3). By creating these simple prototypes, they discovered various design ideas and design components that make up the whole. In this way, they developed a detailed understanding of how a wind turbine blade system operates. Most crucially, they realized that the very complicated 3D digital designs in their minds are made up of several simple structural elements. As a consequence of their understanding of these simple elements, they gained motivation to

complete the task.

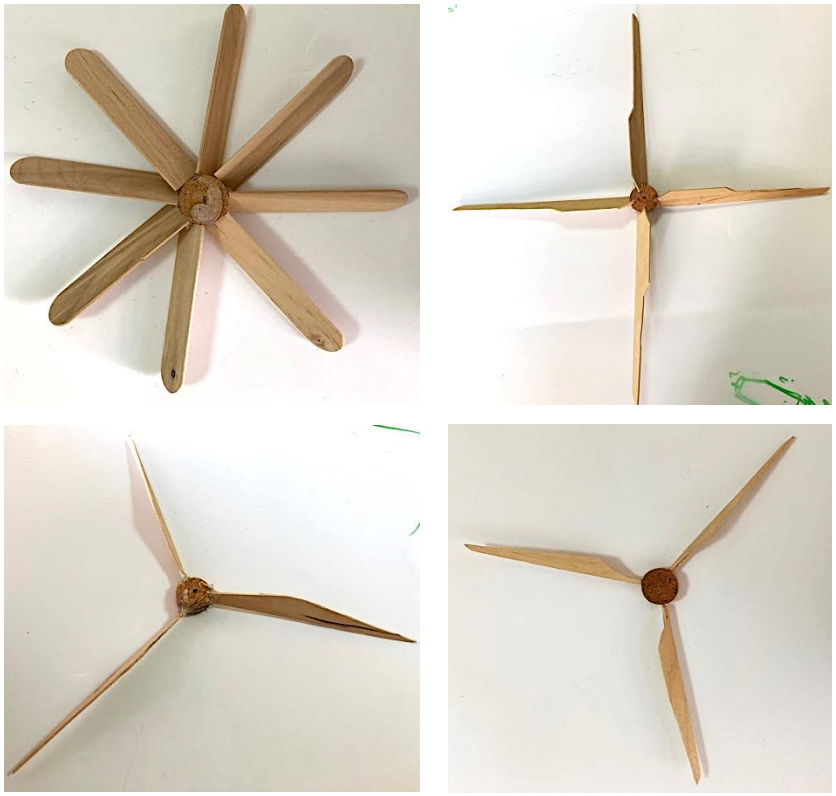


Figure 3. Hands-on Prototypes or Models of Various Wind Turbine Blade Systems

Toolkit 3: Identifying the Design Task's Requirements and Constraints

The third toolkit aims identifying the requirements and constraints of 3D digital designs through the physical hands-on models. Another way for clarifying the task is to collect information on the requirements to be embodied in the solution as well as the constraints (Chakrabarti, 1995). This section is so strongly tied to the objectives set out in Toolkit 1, and preservice teachers should continue with the objectives they set forth when working on identifying the requirements and constraints. Requirements may be characterized as the cornerstones of the path to objectives, so the path to follow is determined beforehand to and the requirements that form the cornerstones is planed accordingly to this. When it comes to design, on the other hand, certain limits or restrictions must be overcome. According to the National Research Council (2012), restrictions that frame the outstanding conditions under which the problem must be resolved may be physical, economic, legal, political, social, ethical, aesthetic, or time and space-related, or in terms of quantitative measurements, such as cost, size, weight, or performance.

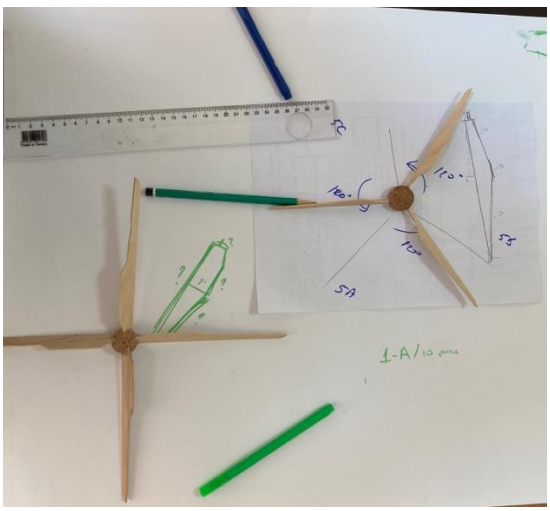
During this part of the course, preservice teachers defined a broad range of requirements, many of which have been also addressed by Dym et al (2002). Several requirements discussed with teacher candidates for the digital design of wind turbine wings, for example, are:

- Physical dimensions of 3D digital design,
- The way and the angles to attach the wings,
- Software to be used in design,
- Unusual measuring equipment (for example, using protractors for wing positioning),
- Printing parameters,
- Material and assembly requirements,
- Adaptability requirements (being able to connect different numbers of wings to a single body).

In addition to these, as outlined in the first toolkit, some designs necessitated one-to-one dimensions with single-wing construction, while others required designing the entire model while ignoring some technical difficulties (see Figure 4). The preservice teachers, on the other hand, were well convinced that their digital design had to keep to some key constraints. Some of these are, for example:

- Sizing digital design's print area (fit the product on the printer table),
- Drawing wings at the exact number and form of the hands-on model's,
- Having parameters that can be printed (sitting on the table).

single-wing construction



the entire model construction

Figure 4. Identifying the Design Task's Requirements and Constraints

Toolkit 4: Making the Transition from Physical Prototypes to Detailed Drawings

The fourth toolkit includes the use of detailed drawings to make the transition from physical prototypes. Detailed drawings, which are considered necessary for engineering design, contribute significantly to the preservice teachers' 3D digital design works. Learning to read and make such drawings, according to Chakrabarti (1995), is an important part of design teaching and learning. The drawings, according to him, contain a variety of elements, ranging from general descriptions (such as general editing drawings) that provide an 'overview' of the work to the most specific (such as dimensions, angles, and details) and precise guidelines on how to make the work.

During the section of the course, the technical characteristics of detailed drawing and the hands-on experience that can be used in drawing were first taught to preservice teachers. It might be beneficial to include in the course a set of guidelines referred to as standardized drawing techniques in engineering education. Dym et al., (2002) summarize these:

- standard drawing views
- standard symbols to indicate particular items
- clear lettering
- clear, steady lines
- appropriate notes including specifications of materials
- a title on the drawing
- the designer’s initials and the date it was drawn
- dimensions and units
- permissible variations, or tolerances

Fig. 5 shows online training for discussing a representative technical drawing. In their freshman practical science laboratory courses, the preservice teachers conducted measuring activities with micrometers, vernier compasses, and rulers. This prior experience was highly beneficial at this point. They were able to easily take measurements through prototypes.

According to Kosky et al. (2021), a detailed drawing should include all the information needed to make the design, and the drawings should be so detailed that they should be able to build the same thing even if they are delivered to someone who is not familiar with the design. This approach prompted the development of a new activity for the courses.

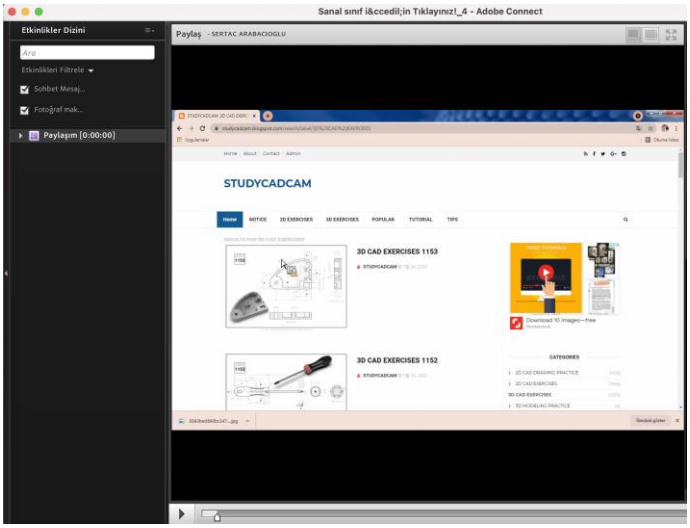


Figure 5. Online Training on Detailed Drawing Techniques

Thus, the initial detailed drawing (see Figure 6) was shared with friends who were unfamiliar with the design for them to criticize it and offer ways to improve it. This activity was useful for precisely translating wing sizes, angles, and general structure into 3D digital design software.

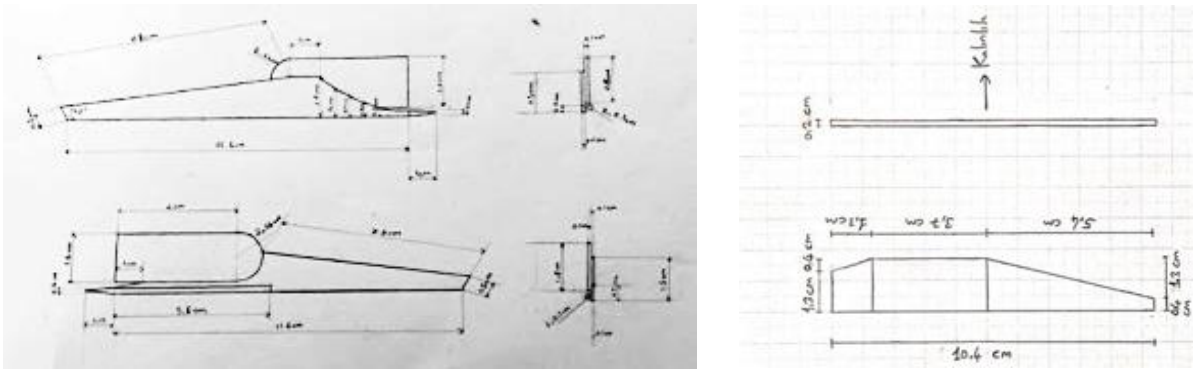


Figure 6. Technical and Nontechnical Examples of Detailed Pencil Drawings

Toolkit 5: Converting Two-Dimensional Pencil Drawings to Three-Dimensional Digital Designs

The fifth toolkit contains techniques for turning two-dimensional pencil drawings into three-dimensional digital designs using a 3D modeling platform like Tinkercad (Tinkercad, 2021). Preservice science teachers will frequently use Tinkercad as a 3D modeling software in their later years of employment.

Thus, in this section of the course, as highlighted in previous studies (Cairns et al., 2018; Trust and Maloy, 2017), preservice teachers receive background knowledge about how to combine, create, and manipulate 3D digital elements and how to make iterative designs until parts or products meet all design requirements (Figure 7).

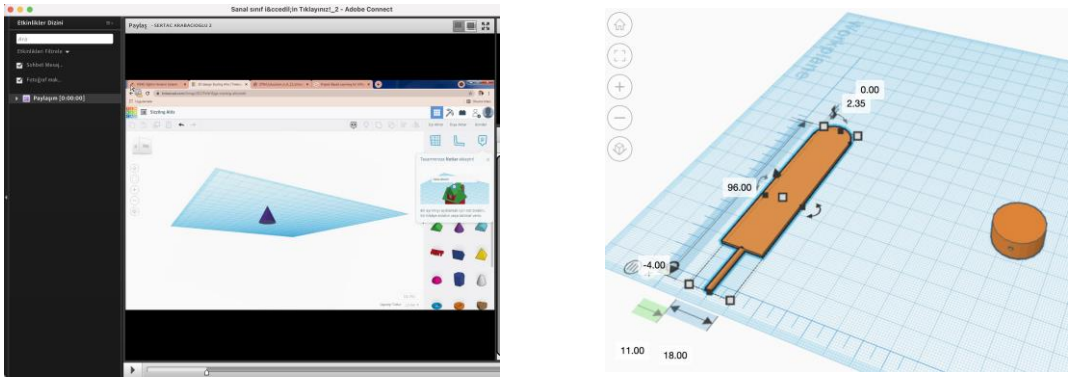


Figure 7. Interactive Trainings on 3D Modeling Platforms

Shaping the digital design using various geometric shapes by combining or extracting the parts and sizing the digital design using dimensions properly and correctly in the pencil drawings were two major challenges for building a 3D digital design. Informal talks with the preservice teachers made clear that prior experiences such as familiarity with the 3D design software, the ability to utilize units and interunit transformations, angles, and geometric shapes, or the ability to use the computer quickly and effectively were highlighted as crucial.

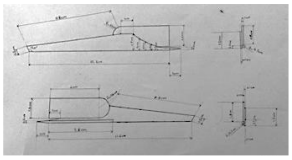
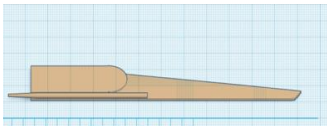
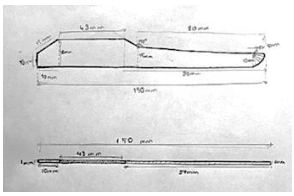
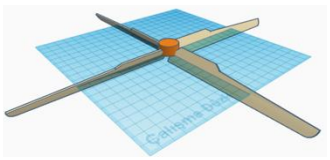
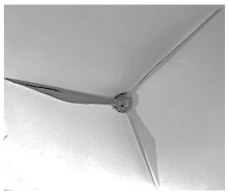
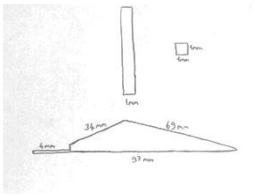
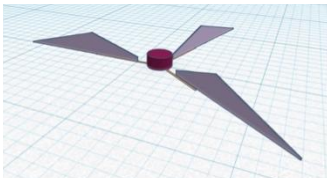
Toolkit 6: Troubleshooting and Reflecting on the Finished Product

The final toolkit concentrates on two aims: Troubleshooting for redesign and reflection on the finished product. Computer-aided reflections on how the design tasks were framed, as well as discussions on the experiences obtained by others, are some of the key last steps in the design process (see Crismond & Adams, 2012; Jonassen, 1994).

During the section of the course, the fact that Tinkercad, a 3D modeling tool, is an easy-to-use web application that supports 3D printing, enabled cooperation between teacher candidates and also to share their design with their peers. They accomplished it in two ways. First, they exported their designs in the STL and OBJ file formats used by 3D printers and emailed them to each other to identify and redesign design troubles. Second, they assigned

co-users to their designs and worked on them simultaneously. Both approaches encouraged pre-service teachers to consider their designs and provide feedback. Table 2 illustrates the progression from a hands-on model of three different wind turbine blade samples to a detailed pencil drawing and three-dimensional digital designs.

Table 2. The Development of Three-Dimensional Digital Designs from Hands-On Models

Hands-on models	Pencil detailed drawing	3D digital designs
		
		
		

Although not directly relevant to the study's purpose, when the product creation process in Table 2 is evaluated via 38 distinct projects, detailed drawings may be considered to establish a link between hands-on models and 3D designs. The results of those with the understanding of technical drawing described by Dym et al. (2002) on page 12 was mostly error-free. This case on detailed drawings was one of the topics that is clearly discussed in reflective practice sessions.

Discussion and Conclusion

The purpose of this study was to introduce instructional toolkits that proceed from applied models to 3D digital designs that can encourage pre-service science teachers in their professional development in 3D visualization. Before introducing the toolkits, first, a modest

summary of mainstream works on 3D design and visualization in education and educational research was offered, which was largely driven by the science education perspective. These brief overviews highlight how 3D design and visualization activities encircle science learning and teaching with a diverse range of applications, including 3D visualization, 3D printing and modeling, 3D virtual learning environments, and 3D virtual objects. It had trouble separating the application boundaries with clear lines and was largely interpreted within the author's viewpoint. However, in Figure 2, a landscape was generated using a large dataset to show the big picture of the studies and allow readers to interpret the academic landscape accordingly to their own views. Secondly, since the objectives of this paper was to support pre-service science teachers, three points were identified as potential opportunities for incorporating 3D designs into school programs: Student learning and knowledge building, curriculum subject areas, and pedagogical enrichments. These findings, thirdly, highlighted the teachers' knowledge and abilities as one of the most significant barriers to integrating 3D designs into school programs, as discussed in the last section of the reviews.

In light of supporting evidence from pre-service teachers' design experiences, the study provides opportunities, encountered challenges, and potential implications for 3D digital designs to introduce toolkits. It provides six practical toolkits demonstrated by the activity "3D digital design of wind turbine blades," which considers the implications of 3D digital designs on the teaching tasks of future science teachers. Many of the technical terms and applications discussed in the toolkits are derived from widely acknowledged methodologies in classical engineering skills (e.g., Chakrabarti, 1995; Crismond, & Adams, 2012; Dym et al., 2002). These practices, however, are the first direct demonstration and supporting evidence of pre-service teachers' experiences with 3D digital design and visualization. In this way, it contributes to the two-growing body of evidence. One of them is studies that highlights the value of design and visualization in the context of science education and teacher development (e.g., Cairns et. al., 2018; Gouseti et al. 2020; Lucas et. al, 2014; Mohammed et. al. 2019). Another line of research is the integration of various technologies, such as 3D designs, visualization, and Tinkercad, to the teaching process in science education (e.g., Trust, & Maloy, 2017; Trust et al., 2021).

One limitation of this study is that it covers design tasks using 38 different project examples, ranging from highly technical to non-technical 3D digital designs on "3D digital design of wind turbine blades." The second point to make is that design tasks, such as transferring two-

dimensional pencil drawings into three-dimensional digital designs, are limited to a relatively specific field of visualization and modeling. And, since the overall purpose of the design task in this process is to visualize the design using Tinkercad software, the procedure is mostly organized for effective use of Tinkercad. Despite these limitations, the present research contributes to a growing body of evidence suggesting the toolkits for teacher education programs and professional development in engineering design practices.

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Chapter 15 - STEM Schools: Benefits, Challenges and Impacts on Education

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Chapter Highlights

- The history of modern STEM schools known today dates back to the beginning of the 20th century.
- Some sources consider Stuyvesant High School as the first STEM school known in history.
- These schools, which had uniform characteristics in the past, provided education to talented and successful students only in STEM fields, and today these institutions also serve students from different segments.
- STEM education centers, like STEM schools, are educational institutions that aim to increase interest and awareness in STEM education fields.
- To this end, this research aims to provide information about the systems of STEM education centers and specialized STEM schools around the world.
- In this context, the areas of activity and qualifications of STEM schools and STEM education centers were examined, and information was given about exemplary educational institutions.

Introduction

The importance of the leading competition of countries regarding technological development, defense, and economic development is increasing day by day. One of the most important factors in a country's ability to keep up with the era it is in and have a say in the race between countries is the education system. In this context, education systems must provide students with qualifications suitable for the requirements of the age. For this reason, many countries that wanted to be ahead in this race had to make radical changes in their education systems and policies (Akgündüz et al., 2015). One of the current approaches that emerged due to this change process is science, technology, engineering, and mathematics (STEM) education. STEM education is accepted by many researchers as one of the key elements that should be included in the education system for countries to develop, lead in the scientific field, and grow economically (Lacey & Wright, 2009).

STEM education (Yager & Brunkhorst, 2014) first came up in the 90s (Sanders, 2009) and then attracted the attention of researchers with the "Next Generation Science Standards" study in 2013. Hence, many researchers have recognized this education as one of the most important educational movements of recent years (Berlin & Lee, 2005; Hebebci, 2021, 2022; Hebebci & Usta, 2022; Irwanto et al., 2022; Nasimov et al., 2022; Reiss & Holmen, 2007; Wejner & Wilke, 2022). STEM education, which does not have a standard definition (Langdon et al., 2011), is a multidisciplinary approach that aims to provide holistic education to students in STEM fields (Morrison, 2006) and supports many educational movements in this age (Capraro et al., 2016; Cavanagh & Trotter, 2008; Daugherty, 2013). STEM education establishes the connection between school, society, and work with an interdisciplinary approach and contributes to competitiveness, STEM literacy, and global entrepreneurship. It also enables students to make connections between the fields of science, technology, engineering, and mathematics and apply these connections in real life (Aydogan & Koc, 2022; Chine, 2022; Serhan & Almeqdadi, 2021; Thomas, 2014).

STEM education is considered to be the most crucial element that preserves the economy, technology, and industrial power of the United States. In this sense, specialized STEM schools have been opened in many states across the country in order for students to develop positive attitudes towards STEM fields and create career awareness (NRC, 2009). Thomas and Williams (2009) linked the foundation of specialized STEM schools and STEM

education centers to concerns in education, politics, and economics. These schools and education centers are educational institutions that have adopted innovative education approaches that meet the age requirements (Akgündüz et al., 2015).

The concept of a school providing education based on STEM is referred to as a specialized STEM school in many sources in the literature. Although the specialized schools mentioned here are not always for gifted students, they are educational institutions designed to meet the needs of students with interests and abilities in a particular academic field (Hugo, 2006). Thomas and Williams (2009) note that the concept of specialized school is perceived as contemporary, but the foundations of these schools were laid in ancient times. It is known that "Boston Latin School" and "Hunter College High School" pioneered these schools in the modern sense. Over time, specialized schools have been transformed by educational reforms and policies. In this context, the most up-to-date approach is the specialized STEM schools that appeal to students with abilities in mathematics and science. These schools basically aim to prepare students for the workforce required for industry (Thomas & Williams, 2009). In addition to these schools, the number of STEM education centers with similar characteristics and carry the general purposes of STEM education has increased in recent years.

Specialized STEM Schools

The history of modern STEM schools known today dates back to the beginning of the 20th century. As a matter of fact, the first STEM schools known in history are accepted as "Stuyvesant High School," established in 1904, and the "Bronx High School of Science," established in 1938 (Thomas & Williams, 2009). In the late 1960s and early 1970s, there was an increase in the number of specialized STEM schools with the emergence of magnet schools (Gnagey & Lavertu, 2016). In 1977, a statewide STEM high school for gifted students was established in North Carolina for the first time, followed by Louisiana, Illinois, and Mississippi in the mid-1980s (Eilber, 1987; NCSSSMST, 2014). The rapid growth of STEM magnet schools and public high schools in the 1980s led to the establishment of the National Consortium for Specialized Secondary Schools of Mathematics, Science, and Technology (NCSSSMST) in 1988 (Atkinson et al., 2007; Thomas & Williams, 2009). Next, the increase in the number of such schools continued. In 2010, 28 states had public high schools, local STEM magnet schools, and charter schools (Thomas & Williams, 2009).

STEM schools stand out as educational institutions where project-based learning and engineering design processes are applied. STEM schools adopt an innovative education approach, and they have an essential goal in terms of improving students' critical thinking skills, increasing interest in STEM fields and academic success, and increasing the number of graduates trained in STEM fields (Akgündüz et al., 2015; NRC, 2011; Lyunch et al., 2013). Thomas and Williams (2009) express that schools that actively incorporate students' natural work into their coursework are the pinnacle of being a specialized STEM school, as it provides a key component of engagement and sustained motivation.

STEM schools have been developed to reduce the gap in math and science achievement among various ethnic groups and enhance all students' math and science scores on standardized tests (national and international) (Bicer et al., 2014; Capraro, Capraro, & Lewis 2013; Capraro, Capraro, & Morgan, 2013). When the historical development process of STEM schools is examined, it is remarkable that the first STEM schools that were established exhibited a selective approach and had an educational approach for gifted students in these fields (Peters-Burton et al., 2014). However, in the following process, STEM schools with different structures were established to ensure that everyone can take part in the STEM workforce without any discrimination and provide the idea of equal opportunity (Lynch et al., 2013).

The USA, one of the leading countries in the fields of science and technology in the world, is still concerned about not having enough qualified STEM workforce (Hebebci, 2022). The US Congressional Research Center Service Report emphasizes that the USA will not have the STEM workforce it needs in the coming years (Kuenzi, Matthews, & Mangan, 2006). For this reason, throughout the country, the importance given to STEM education has been increased, and new STEM schools have been opened in fifteen different states, especially in states such as Texas and Ohio (Subotnik et al., 2010).

The National Research Council [NRC] (2011) created three different categories of STEM-focused schools that can meet the overall goals of STEM education. Although these categories do not represent all STEM-focused schools, each category includes many different school models, and most of these models are adaptable to any level of the education system (primary, secondary, and high school):

1. Selective STEM Schools
2. Inclusive STEM Schools
3. Schools with STEM-Focused Career and Technical Education

Selective and inclusive STEM schools are the two most common types of STEM schools in the USA (NRC, 2011). When the curriculum of selective and inclusive STEM schools is concerned, it is seen that they enable students to engage in practical tasks in a collaborative and competitive environment. Thus, they aim to improve students' science and mathematics learning (Gonzalez & Kuenzi, 2012).

Selective STEM Schools

Students in selective STEM schools that focus on one or more STEM disciplines are selected based on a number of criteria (such as academic achievement and interest) (Erdogan & Stuessy, 2015a). Students in these schools have advanced learning and creative expression skills in STEM disciplines (Means et al., 2008; Subotnik et al., 2007). These schools, which generally have a competitive structure, serve a small portion of the student population in the regions (Means et al., 2008). These schools, with their expert teachers, advanced curriculum, technically advanced laboratory equipment, and professional development workshops, bring together communities of highly talented and motivated students with scientists (Subotnik et al., 2010). The majority of selective STEM schools are self-contained educational institutions in urban areas that aim to recruit the best students in a region. These schools, which offer school opportunities that attract successful young people throughout the state, allow successful students in low-income rural areas such as Virginia and Michigan in the USA to study in their schools with half-day activities (STEM Smart Brief, 2012).

When the literature is reviewed, it is suggested that many educational institutions in the world provide education in this direction. In fact, it is estimated that around 90 selective STEM schools started operating in the USA after the warnings made after 1983 (NCEE, 1983). Additionally, more than 50 schools that are members of NCSSSMST are among the educational institutions listed as an example of selective STEM schools (NRC, 2011). Moreover, science high schools established in the 60s in Turkey can be considered as the first examples of selective STEM schools. When the aims of these high schools are analyzed, it is indicated that students with advanced skills in science and mathematics continue their higher

education in this field, and these schools train scientists in this field and raise individuals with 21st-century skills (MoNE, 2009).

Another selective STEM school is the Kolmogorov School, which continues its educational activities in Russia (Chubarikov & Pyryt, 1993). Professors at Moscow State University work as faculty in this school. In this school, where the lessons are quite advanced, a curriculum is implemented that allows students to carry out independent projects on the subjects they are interested in. Many similar schools also exist in the USA. Stuyvesant High School, Brooklyn Technical High School, Bronx High School of Science, and Illinois Mathematics and Science Academy are among the leading schools in this respect.

Subotnik et al. (2011) grouped selective STEM schools under four headings. These schools are designed to provide advanced coursework, expert teaching staff, and independent research opportunities. However, it should not be overlooked that each school model has additional design features that may affect its graduates (Subotnik et al., 2011):

1. State residential schools
2. Comprehensive schools
3. Schools-within-schools
4. Half-day schools.

State Residential Schools: They are schools that work with government resources. State residential schools are educational institutions that offer class representation to students from all over the state. “North Carolina School of Science and Mathematics,” “Illinois Mathematics and Science Academy,” and “Arkansas School for Mathematics, Sciences and the Arts,” which were established in the 80s and 90s in the USA, can be given as examples of these school types.

Comprehensive Schools: Comprehensive schools, which are among the selective schools, are usually located in metropolitan areas to serve gifted students in a particular discipline.

Schools-within-Schools: These types of schools serve in urban areas. They were established to facilitate and increase additional resources, mostly to less-resourced, ethnically underrepresented, but academically talented student communities (Metz, 2003). Interaction is

established between students in STEM fields and students not in this field in this school model. “Montgomery Blair Science, Mathematics, and Computer Science Magnet” and “Liberal Arts and Sciences Academy” in the USA are important schools in this field.

Half-day Schools: Selective STEM schools are usually low-equity or rural schools. These schools serve students from different geographies to attend advanced STEM courses for part of the day. Students at half-day schools spend the rest of the day in their own school. “Central Virginia Governors School” and “Kalamazoo Area Mathematics and Science Center” are examples of educational institutions operating as half-day schools.

It is known that students studying at selective STEM schools have high levels of interest, skills, and academic achievement in STEM fields. Students who graduated from specialized STEM schools are known to follow STEM fields more strictly than other students. Besides, according to NRC (2011), students who graduated from selective STEM schools are 20% more likely to continue their education in this field than other graduates. This, in turn, makes gifted students interested in math and science more likely to pursue a university education in STEM when provided with a challenging curriculum, instruction with expert teachers, and peer stimulation (STEM Smart Brief, 2011). To this end, most of the students who graduate from these schools receive a university education and take part in critical tasks in their professional lives (IMSA, 2020).

Inclusive STEM Schools

In the early 21st century, the majority of STEM schools, whether publicly or privately funded, take competitive examinations or prior academic achievement into account when admitting students (Means et al., 2008). These selective schools serve to develop and strengthen students’ underlying STEM abilities and interests. The current situation caused disadvantaged students in terms of various factors (ethnic, socioeconomic, and talent) to miss out on the STEM fields. This led to the emergence of inclusive STEM schools that can serve a general audience.

Students who study at selective STEM schools already have high interest, ability, and academic achievement in STEM fields and want to pursue a career in this field. This is one of the biggest sources of criticism for selective STEM schools because the objectives of the

schools providing STEM education are to increase the students' interest in STEM education, their achievement level, and the number of individuals who make a career in this field (NRC, 2011; Öner & Capraro, 2016). These goals can be achieved not only by including students with high interest, skills, and academic achievement in STEM but also by giving every student an opportunity (Öner, 2017).

Inclusive STEM schools do not have a number of criteria for student admission as in selective STEM schools. For this reason, inclusive STEM schools appeal to a wider and diverse student mass (Means et al. 2008; NRC, 2011). Inclusive STEM schools aim to provide support to involve students in STEM fields and provide opportunities for them to master STEM content and related skills, rather than evaluating prospective students on the basis of previous academic achievement (Young et al., 2011). Moreover, inclusive STEM schools strive to attract a more ethnically diverse student population and create opportunities for underserved students in STEM fields (Slavid, Holmlund Nelson, & Lesseing, 2016).

Roberts (2009) emphasizes that inclusive STEM schools are an important opportunity for underrepresented students in STEM fields. In this context, a safe environment, new technology, or an effective higher education preparatory program can be listed among the reasons for students to choose inclusive STEM schools (Lynch et al., 2013; NRC, 2011; Young et al., 2011). These STEM schools have a preparatory curriculum for higher education institutions, expert teachers, and a technology-rich environment (NRC, 2011).

In the USA, the Bill and Melinda Gates Foundation contributed to the spread of the inclusive STEM school model by providing financial support to large-scale initiatives in Texas, Ohio, North Carolina, Tennessee, and Washington in the early 21st century and supported many government-initiated programs. Similarly, a major university and two nonprofits in Ohio established an inclusive STEM school in 2006, serving many students (Gnagey & Lavertu, 2016). Later, these institutions collaborated with the Bill and Melinda Gates Foundation to receive financial support for the Ohio STEM Learning Network (OSLN). Ten other schools established, including the STEM high school established in 2006, were designed for STEM education (Gnagey & Lavertu, 2016). The five broad design features for schools created by OSLN are as follows (OSLN, 2014):

1. Creating new skills and sharp mines for the new century
2. Build partnerships to accelerate capacity and expand opportunity
3. Starting and staying small
4. Making STEM literacy accessible and desirable for all
5. Promoting scalable and sustainable innovations

The main purpose of all specialized STEM schools is to prepare students –especially those who are historically underrepresented– for careers in STEM fields (Erdogan & Stuessy, 2015b). Studies revealed that inclusive STEM schools tend to serve a different student diversity than both their own schools and traditional public schools (Means et al., 2008; Means et al., 2013). To see the performance levels of inclusive STEM schools, Young et al. (2011) compared students attending inclusive STEM schools with students attending traditional schools in terms of academic achievement.

Consequently, they found out that students in the inclusive STEM school were more successful. However, some researchers suggest that inclusive STEM schools do not positively affect students' science and mathematics achievement (Gnagey & Lavertu, 2016). LaForce et al. (2014) report that inclusive STEM schools generally focus on problem-based and personalized learning and life skills development rather than highlighting science and mathematics courses.

Schools with STEM-Focused Career and Technical Education (CTE)

Career and technical education (CTE) is one of the important components of high school education in the USA. In this sense, when national education statistics are examined, it is seen that more than 90% of high school students receive at least one CTE credit (Levesque et al., 2008). A study conducted by the National Research Center for Career and Technical Education (NRCCTE) similarly suggests that more than 50% of students receive 1-3 CTE credits (Stone III, 2011). Developments in education necessitated the integration of CTE school curricula with STEM programs to meet the need for a workforce with STEM skills. STEM-focused CTE schools are usually located in training centers, comprehensive high schools, or career academies (Erdogan & Stuessy, 2015a).

STEM-focused CTEs are educational institutions that prioritize student motivation through

real-life applications and aim to develop technologically competent individuals (STEM Smart Brief, 2011). It is not easy to make a sharp distinction between STEM-focused CTEs and other STEM programs in this context. Hence, today, all CTEs are somehow related to STEM fields. Contrary to general judgments, CTEs are not only concerned with engineering but also with science, mathematics, and technology (Stone III, 2011). Student groups in these schools continue their education life by continuing their school or programs for half a day after going to a school determined by the region.

These schools also have two important purposes, such as preparing students for higher education and supporting students who tend to drop out (Erdogan & Stuessy, 2015a). To achieve these two goals, the schools provide students with practices on using STEM education in the classroom in the real world (NRC, 2011; Stone III, 2011).

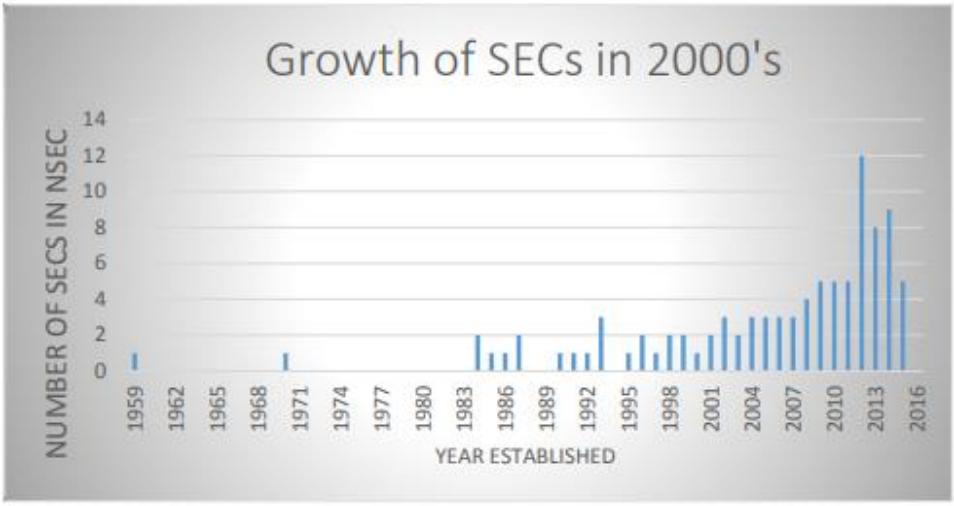
“Dozier-Libbey Medical High School” and “Sussex Technical High School” are educational institutions that can be given as examples of STEM-focused CTE schools. A model for STEM-focused CTE programs, “Sussex Technical High School” is a nationally award-winning school. Established in 1961 on a part-time basis, the school now serves 1300 full-time students selected by lottery.

The graduation rate of students in the school, which low-income families generally prefer, is quite high. Each student who takes core courses in the first year of school then receives training in one of the 15 business areas (automotive technologies, health/human services technologies, communication/information technologies, and industrial/engineering technologies, etc.) appropriate to local business needs. The process is concluded by giving a “STEM mastery certificate” to students who successfully complete the training (STEM Smart Brief, 2011).

STEM Education Centers

STEM education centers are educational organizations focused on STEM fields established within universities and private institutions in many countries, especially in the USA, England, and South Korea (Karahan, 2017). Many countries are making important innovations in the field of education to compete in the global race with each other, and they are trying to spread these innovations to all segments of society. It is thought that STEM education centers have a

crucial potential in the dissemination of STEM education, which is one of these education movements (Bircan, Köksal & Cımbız, 2019). Although STEM education gained rapid momentum in the 2000s, STEM education centers have a much longer history. According to the report published by Networks of STEM Education Centers (NSEC), these education centers emerged in the 1950s (Graphic 1).



Graphic 1. Development of STEM Education Centers in the 2000s (Horii et al., 2017)

As of August 2017, NSEC reported connections between 201 STEM Education Centers/Institutes/Programs at 163 institutions (Image 1). Yellow stars indicate institutions headquartered in the NSEC, while blue stars indicate centers dealing with NSEC through meetings and listserv (NSEC, 2017).

Image 1. NSEC STEM Education Centers/Institutes/Programs

Karahan (2017) discussed the aims of STEM education centers under three headings:

1. developing STEM-oriented undergraduate programs,
2. developing and implementing STEM-oriented pre-service and in-service teacher training, and
3. creating a widespread effect in the institution and region they are in by interacting with the society.

Although STEM education centers were established for the same purpose, they are differentiated from one another based on (1) target audience, (2) vision and mission, (3) resource and funding level, (4) physical space and employment dimension, (5) experience, and (6) location on campus. However, although there are administrative or structural differences, the activities carried out are similar (Karahan, 2017).

When the structuring of national and international STEM education centers is examined, it is seen that there are basically three different structures (Karahan, 2017):

1. STEM education centers within the university (Example: National STEM Center established within the New York University National Science Learning Center)
2. STEM education centers established with the initiative of independent individuals and institutions (Example: Education Consortium for the Advanced of STEM Egypt [ECASE])
3. Units focused on STEM education in informal learning environments (Example: Training given by Retired NASA Astronaut Story Musgrave at the US Aviation Museum)

Conclusion

In today's world, where the leadership competition between countries has become a core issue, the importance of the trained and trained workforce in STEM fields is regarded as an essential component. In this context, it is an expected situation that countries that train their student population according to the century in which they have and gain the necessary technical skills and abilities will always be ahead. In this regard, the importance of institutions and training programs for STEM education is increasing day by day.

When the literature is examined, it is seen that the studies on STEM schools and STEM education centers are quite limited. Hence, this study gives information about the past and present of STEM education centers and specialized STEM schools around the world. In this context, the fields of activity and qualifications of STEM schools and STEM education centers were examined, and information was given about exemplary educational institutions.

Examined STEM schools can be considered from various aspects such as student admission, student population, achievement, and geographical region. To this end, selective schools basically have the following characteristics: (1) Expensive schools (The students usually pay fees), (2) There is a rigorous student admission system (High academic achievement), (3) They target the student population with potential for STEM fields. (4) There are over 100 high-level courses, (5) The number of students is not crowded, (6) There are personal training plans for students, (7) The rate of sending students to higher education is high, (8) They are collaborating with scientists, and (9) Student population with high socioeconomic level enroll.

The general features of inclusive STEM schools can be listed as follows: (1) There is no requirement for student admission; anyone can apply, (2) They have a student population from middle and low socioeconomic levels, (3) The courses are not as intense as selective STEM schools, (4) The level of academic achievement is higher than other public high schools, (4) They are collaborating with scientists, and (5) They provide opportunities to students who are less represented ethnically.

STEM-focused career and technical schools have similar characteristics to inclusive STEM schools: (1) There is no requirement for student admission, anyone can apply, (2) They are crowded schools, (3) They have a low socioeconomic level student population, (4) The graduation rate is high, and (5) These are vocational education-oriented schools.

In Table 1, selective STEM schools, inclusive STEM schools, and STEM-focused careers, and technical schools are compared from various perspectives. In the creation of the table, schools in “Illinois Mathematics and Science Academy (IMSA)” Aurora, Illinois, “Delta High School,” Tri-Cities area, Washington State, “Sussex Technical High School,” Georgetown, Delaware were considered.

Table 1 indicates that selective STEM schools are superior to other schools in many aspects. Thus, it is known that almost all of IMSA's graduates have enrolled in a university program since 1985 and then took charge in important institutions (IMSA, 2020). It is noteworthy that inclusive and STEM-focused CTEs are similar in nature. Considering the higher success rates compared to other public high schools and the need for the world's STEM workforce, it is necessary to increase such schools rapidly. Hence, such school investments and programs should be supported by state and private foundations.

Table 1. Comparison of STEM Schools

Criteria	**Selective STEM schools**	**Inclusive STEM schools**	**Schools with STEM-focused career and technical education**
Student admission protocol	By exam	Lottery	Lottery
Socio-economic status	High	Medium-Low	Low
STEM Potential	High	Medium-Low	Medium-Low
Course intensity	High	Medium	Standard
Continuing higher education	High	-	-
Student population	Less crowded	Standard	Much crowded
Academic achievement	High	Higher than public schools of its level	Higher than public schools of its level
Graduation rate	High	High	High

STEM schools and STEM education centers are basically institutions that serve the purpose. However, STEM schools are more complicated than STEM education centers, and these institutions' processes are more systematic. STEM education centers are mostly founded within a university. Besides, STEM schools are educational institutions that mostly appeal to pre-university students. In summary, both STEM schools and STEM education centers aim to increase interest, skills, and academic achievement in STEM fields that countries need most.

Notes

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Chapter 16 - Everything Old is New Again: A Mathematical History Lesson for Cybersecurity Students

Donna M. Schaeffer, PhD, Patrick C. Olson, PhD, Ana H. Valentín, DSc

Chapter Highlights

- This paper discusses how the application of mathematical and statistical concepts in coursework and professional jobs improve the decision-making process in organizations.
- This paper suggests not only teaching the "how to" of these mathematical concepts but providing the students with background on the people (e.g., Simeon Poisson and Thomas Bayes) who conceived the theories that are vital components of today's cybersecurity solutions.
- This paper also identifies ways to incorporate mathematical theories into lesson plans for cybersecurity education in a manner that enhances students' appreciation of the rich history behind a current phenomenon like cybersecurity and the importance of interdisciplinary knowledge, in an engaging way.

Introduction

As recently as 2011, information technology professionals were debating the utility of academic programs of study specifically in Cybersecurity (Winkler, 2011). Curriculum guidelines for post-secondary degree programs in Cybersecurity were introduced as recently as 2017 (Joint Task Force on Cybersecurity Education, 2017). So, while the academic discipline may be considered "new," the concepts that provide the foundation are not.

Anecdotally, when asking doctoral students why their literature review chapter drafts for dissertations in cybersecurity were often very short, a typical response was "It's all new." Thinking about the use of techniques such as Bayesian Networks for threat analysis, our response was "No, it's not new." This reminded us of the Peter Allen song lyrics (Allen, 2021):

Don't throw the past away,
You might need it some rainy day.
Dreams can come true again,
When everything old is new again

Careers in Cybersecurity: Dreams Can Come True

All reports indicate the demand for qualified workers in the cybersecurity field will outpace the supply. According to the Cybersecurity Supply/Demand Heat Map, a federally funded site overseen by the National Initiative for Cybersecurity Education (NICE) and corporate partners Burning Glass and CompTIA, there were 521,617 cybersecurity job openings across the United States at year-end 2020. The following figure is part of the "heatmap" found at cyberseek.org (Cyber Seek USA 2021, 2021) and shows the demand for cybersecurity personnel by state.

A few years ago, Cybersecurity Ventures predicted there could be as many as 3.5 million unfilled cybersecurity positions by 2021 (Perhach, 2018). More recent updates by the Bureau of Labor Statistics predict the number of cybersecurity jobs will grow by 31% by the end of the decade, a rate that is more than seven times higher than the national average job growth rate of 4% (Columbus, 2020). It is interesting that as employment shrunk in other industries around the world, the COVID-19 pandemic had not impacted cybersecurity jobs. The reliance

on online environments for work, education, and general needs like shopping, demands secure networks designed, installed, and managed by trained professionals. Increases in cyberattacks, such as the SolarWinds breach, compromise systems at the Pentagon, intelligence agencies, nuclear labs, and Fortune 500 companies. A PwC (PwC, 2020) study reveals only 3% of organizations expect to cut their cybersecurity projects and/or workforce, compared to anticipated cuts of up to 62% in other areas.

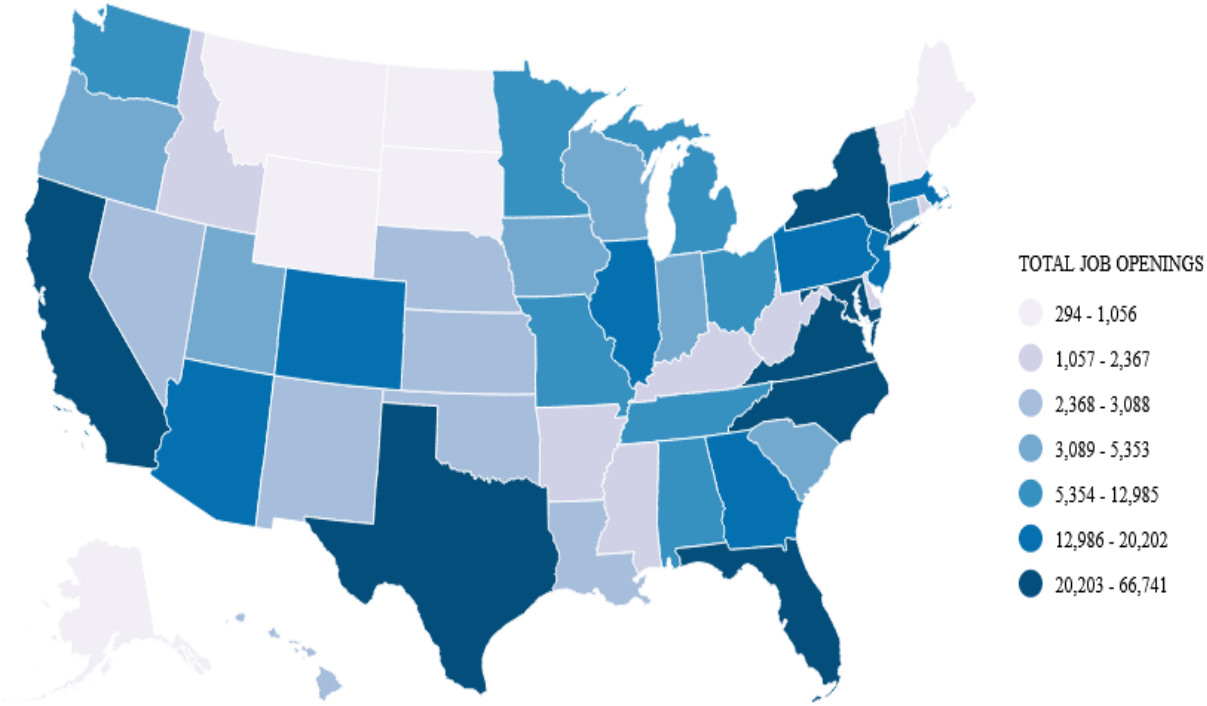

Figure 1. Map of Job Openings in the Cybersecurity Field

The high demand for qualified workers coupled with the shortage means that most jobs in cybersecurity are well-paying. In 2020, the Cybersecurity and Infrastructure Security Agency, established the National Initiative for Cybersecurity Careers and Studies which is an government organization that is partnered with National Initiative for Cybersecurity Education (NICE) under the National Institute of Science and Technology (NIST). In 2022, NIST NICE reported that the average salary for cybersecurity professionals is $116,000 in the United States.

The second source of information on salaries for cyber security is provided at the ZipRecruiter website which uses data provided by ADP. The information is shown by state with a high in New York of $125,000 and a low in North Carolina (ZipRecruiter, Inc, 2021).

Jobs are plentiful, secure, and well-paying. To tie back to our chorus lyrics, dreams can come true.

Role of Mathematical and Statistical Methods in Cybersecurity

Most colleges or universities offer an introductory math course to provide a foundation of math theories and an introductory statistics course to provide the basics of probability and statistics for potential cybersecurity professionals. Sample course descriptions from Bucks County Community College are described on Table 1 (Bucks County Community College, 2021).

Table 1. Examples of Course Descriptions

Math 101: Mathematical Concepts Course content includes sets, symbolic logic, elementary probability, and such optional topics as basic statistics, game theory, or linear programming. Stat 115: This course is primarily for business, science, liberal arts, and education majors. Topics studied include descriptive measures for empirical data, theory of probability, probability distributions, sampling distributions of statistics from large and small samples, estimation theory, hypothesis testing, correlation, and regression.

These mathematical concepts underly how cybersecurity tools function, for example, the set theory was a foundation of data sets. Yang, Shi, Zhang, Wu, & Shi (2019) developed a method to detect simultaneous attacks from multiple sources using set theory. Set theory can be illustrated with Venn Diagrams. Cybersecurity analysts could use Venn Diagrams to identify two sets of IP addresses, for example, those that only log on to the system at certain hours. This could lead to uncovering malicious activity by bad actors. In 2018, Walker suggests the use of Venn Diagrams for assessing risks and threats.

Symbolic logic is a topic covered in math courses. Data and information from several domains can be combined with experts' reasoning. Byrd (2020) stresses the importance of

machine learning, based on symbolic logic, in pro-active cybersecurity defense mechanisms. Topics such as elementary probability can be used to answer questions such as "What is the percentage of a breach?" and knowledge of basic statistics is necessary for cybersecurity analysts to visualize and present information to decision-makers.

Bayes Theory in Cybersecurity

Thomas Bayes, an English statistician, philosopher, and Presbyterian minister who lived from 1701 to 1761 developed a theory to determine the probability of events, given that specific conditions exist. Bayes started with the randomization of 100 balls in an urn, where 50 white balls and 50 black balls to determine the probability of drawing a black ball. Once Bayes defined the theory of probabilistics, mathematicians have broadened the notion of Bayesian theory to networks. A recent scholar.google.com search for the terms "Bayesian and Cybersecurity" yielded over 13,300 results with more than 2,500 in the past year.

Game Theory in Cybersecurity

If time and student readiness allow, a basic math course could include game theory and linear programming. Game theory is often used to model the interactions between attackers and defenders. Some recent publications with examples of game theory applications for cybersecurity include Anwar et al (Anwar, Khan, Olanrewaju, Pampori, & Mir, 2020); Lakhno et al (Lakhno, et al., 2020); and Cotae et al (Cotae, Kang, & Velazquez, 2020).

Linear Programming in Cybersecurity

Linear programming is a tool that can be applied to managing network constraints efficiently. Sawik (2020) applies linear programming techniques to optimize investment in supply chain cybersecurity, while Lee (2020) uses it for general cybersecurity investment decisions. Evangelou and Adams (2020) demonstrate linear programming's value for anomaly detection.

Discussion

These concepts are taught in early college-level math courses. The concepts provide the pre-

requisite knowledge for successful performance in advanced math courses; they are also useful in professional work in the field of cybersecurity. This leads to the question: If students learn these mathematical concepts in Math 101, will they remember them in an upper-level or graduate-level cybersecurity course or on the job?

Hermann Ebbinghaus (Ebbinghaus, 1913) theorized that humans start losing their memory of learned knowledge over time, in a matter of days or weeks unless the learned knowledge is consciously reviewed time and again. Although based on experiments with an n of one (himself), his theory has gained credence over the last century and is popularly known as the Ebbinghaus Forgetting Curve. Wees (Wees, 2017) identifies strategies that cognitive psychologists suggest for improving student retention of concepts. These strategies include spacing out opportunities to practice, applying concepts in problem-solving, and connecting new concepts to past concepts that have been learned. Three strategies will be discussed in the following section of this article, namely using representations, visuals, and drawings to make explicit connections; using real-life examples, and making analogies. Mr. Robot, for example, is a recent television series whose “hero” is a cybersecurity engineer for his day job, and also a vigilante hacker hired by a mysterious figure/organization to carry out a hack that as the series’ episodes unfold, we find will have deep ramifications. A scene in the opening episode graphically brings the scholarly Bayesian Network theory to life in an exciting way.

Pearson’s Correlation and Differential Equations

Correlation originates in the work of Sir Francis Galton (British, 1822 – 1911) and Karl Pearson (1857 – 1936). Karl Pearson, founder of modern statistics, came to this field by way of passionate early studies of philosophy and cultural history as well as ether physics and graphical geometry (Porter, 2010).

Obilor and Amadi (2018) defined correlation as the measurement of association, relationship, or correlation between two variables to ascertain whether they are positively or negatively related, or not related in any way. The authors stated that two variables are related if the changes in one variable affect or influence the changes in the other variable in order to measure association or relationship between variables. We use correlation coefficients to express the degree of association or relationship (Obilor & Amadi, 2018). In their paper, Shakil, Kibria, and Singh (2010) described the generalization of the Pearson differential

equation which a vast majority of continuous probability density functions (pdf's) can be generated, known as the generalized Pearson system of continuous probability distributions.
The film Hidden Figures illustrates various examples of the concept of correlation and differential equations exposed by the Katherine Johnson performed by Taraji P. Henson. The dramatic scene where Katherine Johnson, a black woman mathematician at NASA, is shown running through hallways, parking lots, and buildings in a bad rainstorm. The film scenes demonstrate different situations faced by women of color to overcome inequality and accessibility of the washrooms in the workplace. The situation turned more embarrassing when Katherine Johnson's boss – a white male – questioned and confronted her about the excessive (in his opinion) amount of time she spent on using the ladies washroom. The scene provides an opportunity to discuss the concept of correlation between time and distance from Katherine Johnson's office to the washroom. Correlation can be applied to cybersecurity in terms of event logs that capture employee sign-ins, log-in attempts, and time of day or normalization, e.g., timestamps have to be the same format to analyze.

The film Hidden Figures also provided another example on how Katherine Johnson stepped up and suggested the application of Euler's Methods which is an ancient differential equation method to describe the business case of Go and No-Go of the capsule to the ocean for a safe landing. Both scenes can be used to discuss serious social issues about how underrepresented women's capabilities, skills, and expertise have been underestimated in the workplace by peers who do not embrace diversity and inclusion in the decision-making process. Thus, our premise is that everything old is new again.

Latinos by the Numbers in Mathematics, Statistics and Cybersecurity Field

The world community cannot effectively defend and protect vast defenseless citizens in the midst of a deeply disproportionate approach against minorities and women (Esin, 2020). In 2020, Esin (2020) pointed out that the lack of diversity in the cybersecurity profession is detrimental to the global workforce and the ongoing determined battle against cyber-attacks on vulnerable global communities. Chabrow (2011) strongly urged to form a united front to include minority women in all facets of cyber-education that encourages intellectual stimulation and professional opportunities for cybersecurity professionals.

In two separate studies, for example, Elan (2012) and Harkinson (2014) found that the

Bureau of Labor Statistics (BLS) under the United States Department of Labor (DOL) revealed that only 19.7 percent of cybersecurity analysts are women. The DOL BLA reflected that only 3 percent African-Americans, 3.4 percent Asian-Americans and 5.2 percent Hispanic and Latinos. The statistics clearly and indisputably demonstrated the lack of diversity in the workforce in cybersecurity careers.

Conclusion

More than 100 years ago, John Dewey (Dewey, 1902) argued that the most effective education occurs when content is presented in a way that relates the information to students' prior experiences. In our examples, students may not have thought of Bayesian Networks in the way shown in Mr. Robot, but they will easily identify the environment shown in the example as what they have encountered at their workplaces which helps bring the concept to life. The book and the movie *Hidden Figures* likely helped make math relevant to a multitude of young black women and girls, popularizing the contributions of Katherine Johnson and her colleagues at NASA.

It is imperative that cybersecurity educators find ways to present mathematical concepts in relevant ways to enhance students' retention of those concepts. As examples, lesson plans could be developed around Ada Lovelace's theoretical contributions to illustrate important women in mathematical history or former McAfee Corporation Chief Executive Officer Chris Young, a black man in the high technology arena.

Crowell (Crowell, 2018) describes an annual calendar that, each day, highlights the achievements of a Hispanic or Latinx mathematician, and the Portland, Oregon Unified School District developed a curriculum around the mathematical contributions of Indigenous peoples. Thus, new dreams can be aided by the past.

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Chapter 17 - Digital and E-Leadership in Higher Education

Deniz Koyuncuoğlu

Chapter Highlights

- Leadership is an extremely important factor for an organization, whose success or failure depends to a large extent on its leadership.
- Instructors have several main functions as leaders at universities.
- As an education and science leader, lecturers constantly confront with lecturers, staff, students and society.
- As a leader, the lecturer must take into account and monitor the community of scientists and all elements in the university, while performing all his duties and making effective decisions to achieve the desired goals.
- In order to better understand leadership, examining its types and scope is a significant start.

Introduction

Today the majority of organizations rely heavily on the skills and behaviour of their managers to create a participatory and healthy working environment for their employees. In this regard, the leadership of managers is one of the most studied social phenomena for more than a century. Leadership is a process that influences others and promotes the efforts of individuals or groups to achieve their goals. In other words, leadership refers to motivate other individuals or groups to fulfil their main objectives. Leadership is an extremely important factor for an organization, whose success or failure depends to a large extent on its leadership (Koyuncuoglu, 2021).

Leadership has a vast number of definitions. In the most general terms, people who have high rhetoric skills and who can mobilize, direct and motivate people are called "leaders" in terms of both their speaking styles and behaviors (Bass & Stogdill, 1990; Koçel, 2015). The vast majority of researchers define leadership according to their individual perspectives and aspects of the phenomenon that interest them most. In the book Management: A Guide to Executive Command (Marno et al., 2008: 187) by James M. Black, leadership is defined as “the ability to convince others to work together as a team under one's leadership to achieve a specific goal. Indara Fachrudi (2006: 2) also states that leadership is an activity to lead a group in this way to achieve a common goal. He points out transformational and transactional leadership in the 21st century and attributed charisma, idealized influence, inspirational motivation, intellectual stimulation by arguing that the transformation process with individualized characteristics can be seen with a series of transformational leadership behaviors (Bass & Avolio, 1994). Rival (2004) states that a leader always involves employees in the decision-making process, puts subordinates as partners in the work, and promotes a social feeling that will encourage a positive attitude from subordinates. Schermerhorn et al. (2011) defines leadership as: "Leadership is the process that affects other people and the process facilitates the achievement of one's or group's goals". In the Vroom-Jago model, Ivancevich et al. (2014), leadership considerably impacts the effectiveness of decisions, decision-making styles, and diagnostic procedures. Effectiveness criteria for decisions involve the quality of decisions as regards the extent to which decisions affect performance, while subordinate commitment relates to how important decisions are made or accepted by subordinates before the decisions can be applied.

Leadership in the world of education is a skill and process that directs, coordinates and mobilizes other people so as to develop educational science and implementation of education with the aim of carrying out the activities in a more effective and efficient manner. The ability and skill of a person, especially a leader, to make rational, logical, realistic and pragmatic decisions is a crucail criterion in measuring leadership effectiveness.

A good leader can influence other people to support a corporate goal. Universities are one of the educational institutions and organizations managed by the teaching staff. Instructors are one of the most influential people who play an active role in improving the quality of education. In this context, lecturers are influential people and play a vital role in the functioning of the university. Instructors have several main functions as leaders at universities. As an education and science leader, lecturers constantly confront with lecturers, staff, students and society. As a leader, the lecturer must take into account and monitor the community of scientists and all elements in the university, while performing all his duties and making effective decisions to achieve the desired goals.

A long history of research on organizational culture has identified leadership as a critical facilitator of the evolving context in organizational settings (Ehrhart, Schneider, & Macey, 2014; Karagöz, Dinç, & Kaya, 2022; Sahin, 2022; Yıldırım & Yenipınar, 2021). Although there is little consensus in the related literature on the precise distinction between leadership and management (Ehrhart et al., 2018; Yukl, 2013), the term leadership is used as a determining factor in order to be consistent with the relevant literature in this field and to capture the impact of those in leadership roles on the units they lead. In order to better understand leadership, examining its types and scope is a significant start.

Types of Leadership

Interestingly, a review of the literature on leadership and types of leadership reveals that despite changes in technological developments and the way we work and learn in a digital context, the literature remains relatively unchanged in the 21st century. Various leadership theories have been put forward and tested in different situations in different countries. For example, Karl Marx's leadership theories have been applied to various countries, such as China, Cuba, and the former Soviet Union (Wang, 2017). Leadership theories can be applied partially or completely or modified according to different situations.

Although there are many definitions of leadership with various concepts, leadership is actually associated with human behavior. As might be expected, it has an intricate meaning. As a result of the interpretation of leadership by people in different ways and depending on the environment and conditions, various types of leadership have emerged in recent years. Leadership types fill a gap in that they appeal to different situations and different audiences. Just as there are many definitions of leadership, there are many types of leadership:

- *Ethical Leadership:* Ethical leadership rests on basic components such as respect to community, different ideas and cultures. Hence, leaders are supposed to adopt moral values (Brown & Trevino, 2006: 596).
- *Charismatic Leadership:* Charismatic leadership often gains importance in environments of chaos and crisis, and charismatic leaders come out during these times. Historical figures such as Atatürk, Gandhi and Martin Luther King are charismatic leaders who emerged as a result of the negative conditions of their countries (Gül & Çöl, 2003: 164).
- *Visionary Leadership:* Three prominent roles of visionary leadership are as follows: a) seing the way, b) walking on the road, c) being the way. Seeing the way is the leader's intuition and thinking power, interpreting the future correctly and shedding light on his followers. Walking on the road is the leader's ability to see the road and succeed in walking on this road (Nwokedi, 2015: 89-90).
- *Transformational Leadership:* Transformational leaders, who plays a key role in the main objectives of the organization and the personal goals of their subordinates, direct staff to a vision rather than simply giving concrete goals. Transformational leaders are aware of the need to reveal the talents of their followers and increase their self-confidence in order to achieve long-term goals. (Northouse, 2001: 131).
- *Distributive Leadership:* Distributed leadership opposes having someone at the head of the organization to bring about change. When organizations have a structure that is too complex for one person to manage, the leadership of individuals within the organization is needed (Spillane, Halverson, & Diamond, 2001: 24).
- *Cultural Leadership:* The cultural leader has to focus on the norms and cultural structure of the organization. Therefore, the concept of cultural leader is preferred for behaviors, attitudes, legends, heroes and ceremonies in organizations (Balkar, 2015, 274).

- *Servant Leadership:* Servant leadership, which emerged with Greenleaf's 1977 article "The Servant as Leader", is a leadership school based on the "people first" and "service-oriented" philosophy of standard leadership understandings. With this philosophy, servant leaders turn the understanding of "putting their soul into the work" into their corporate culture, thanks to their communication skills. As a result of this, corporate culture is reinforced and protected in line with the principles of servant leadership (Çalışal & Yücel, 2019: 169).
- *Instructional Leadership:* It is obvious that university administrators act as a guide or model and act to improve the performance of the school. In other words, instructional leadership is the process of encouraging the professional development of school or university administrators and teachers (Kış & Konan, 2014: 2130).

E-leadership

The emergence of information and communication technologies has greatly affected both organizations and leaders (Sendogdu & Koyuncuoglu, 2022). Considering the essential elements of e-leadership supported by facilitative leadership, it is significant to understand that leadership theories are not ideologies that should be followed to the letter, but that leadership theories can be partially or fully applied (Wang, 2017).

The term e-leadership describes leadership in today's unconventional virtual business environment. E-leadership refers to leadership, which is a global economy in our modern age, that is, in the information age defined by the dizzying development of technology, where organizations constantly move beyond borders to wherever they can make a profit. Leadership is supposed to solve many problems created by the information age. Today, there is a significant and increasing participation in online environments for both business and education. Therefore, e-leadership is very important in our time and in the future, and therefore researchers and academics are encouraged to re-examine leadership and leadership styles in relation to e-leadership (Contreras, Baykal, & Abid, 2020).

E-leadership is an extension of traditional leadership and it also represents a crucial change in how leaders and followers relate to each other within the organizations (Avolio & Kahai, 2003). E-leadership also means the development of different abilities to improve

organizational functioning in virtual work environments (Roman et al., 2019). For e-leaders, the skills needed to effectively communicate in virtual environments are not limited to face-to-face capabilities. They also need to be complemented with the necessary skills to manage multiple platforms.

Education leaders encounter far-reaching challenges in the age of information and communication technologies (ICT) owing to the dynamics of workplace. The biggest challenge is when staff or subordinates are physically dispersed from their leaders. Since leaders are constantly bombarded with a schedule of formal commitments and meetings, they cannot focus and interact with their subordinates on a regular basis (Albidewi, 2014; Ibrahim, 2014 & Schultz, 2010). To understand this challenge, the use of ICTs with new applications to monitor and control various workplace activities such as computerized internet, smartphones is increasing by education leaders. Likewise, teaching-learning processes are equipped with the latest technologies to increase effectiveness. As educational institutions digitize their services, operations and innovations, the role of leadership is getting harder and harder. Only e-skilled training leaders can effectively manage their subordinates.

Jameson (2013) defined e-leadership as a "virtual influence relationship" by stating the theory of adaptive structuring, explaining how leadership and technology influence each other and ultimately how e-leadership becomes heavily dependent on e-skills, e-knowledge and e-leadership expertise. Fonstad (2013) argues that e-leadership means technology-leadership integration that includes expertise in the use of ICT and expertise in guiding the organization through these skills.

E-leaders can play a central role in the functioning of Universities, especially as they influence how a team copes with obstacles and how the team ultimately adapts in the face of such challenges. Zander, Mockaitis, and Butler (2012: 593) view e-leaders as boundary switches, bridge-builders and mixers, as they play an important role in promoting motivation and commitment.

Digital Leadership

Digital leadership can be defined as setting the direction, affecting others, building relationships, initiating sustainable change through access to information and predicting

changes that will be critical to school success in the future. Effective digital leaders represent responsibility and encourage employees to innovate and improve in a changing era. Leaders must create an environment in which the people of the Organization can accept this change and understand how it affects business structures. Digital leaders are keenly curious about the problems that arise in the education process. They adopt an open mind and make every effort to encourage creativity. Digital leaders "helps the organization to find state-of-the-art alternatives to obsolete programmes and legacy systems".

Digital education is also referred to as technology-enhanced learning or e-learning. In short, digital education is teaching using technology and digital tools. This innovative application of digital technology benefits both teachers and students. Digital leadership practices are very compatible with emotional-led change and trade-like leadership styles (Özmen, Elias, & Özer, 2020). As emotional intelligence becomes the focus of digital and transformational styles, a leader is expected to turn to the ability to actively motivate students, teachers and other staff in the education sector. The ability of leaders to motivate and motivate leaders and to motivate them to follow the vision they support is seen as a fundamental principle of leadership for change. Leadership styles are closely linked to contemporary methods of supervision that focus on strengthening the commitment of teachers to provide best practices, fostering a collegial school culture, fostering a common vision and supporting the development of leadership among teachers and students. As a result, the digital and change leadership approach can be combined to motivate educational supervisory leadership teams and leaders to develop ideas, goals and objectives and to adopt a variety of technical approaches to change.

The relationship between digital leadership and educational oversight is also reflected in the various elements of leadership digital capacity. In schools, digital learning is now growing rapidly and educators need to be facilitators of learning in order to be effective. This means that education inspectors have a responsibility to focus on promoting learning, flexibility, openness and development orientation, and to empower teachers and students in digital learning (Vermeulen and others, 2015). In general, it has been argued that educators, including educational supervisors, can contribute to learning by demonstrating digital leadership, such as vision, professional development, professional learning networks and model risk-taking. Research findings suggest that, with vision and knowledge to encourage learning, it will have a positive impact on ICT-related professional development efforts,

encouraging educators, including education supervisors, to use digital learning tools in their daily work. Guthrie and Meriwether (2018) identified mentoring, mentoring and coaching as important components for the active development of digital leadership.

E-Leadership and Digital Leadership in Higher Education

With rapid changes in technology, it is almost impossible to adapt to the process of change using old leadership. Transition leaders are believed to be best able to adapt to this pace of change. Leadership for change can be defined as leading the Organization towards sudden and effective change. In the area of leadership for change, innovative leadership is needed to promote learning rather than leadership understanding, which depends on control over the internal environment of the Organization. It is therefore becoming increasingly essential to develop new organizational values that support change.

Organizational leadership is a relevant process with social impact, where leaders guide, support and assist their followers in achieving predefined organizational goals. The leaders of the organization put forward a vision and shared it with others to achieve that goal. Congh and Kanongo (1988, 1992) noted that leaders set the direction for the designated groups, sought commitments and commitments, and then inspired their members to achieve the desired goals. Leadership also emphasizes motivation rather than the fulfilment of everyday organizational goals (Benis, 1989). However, leadership has now become a gradual influence that helps in the day-to-day management of day-to-day affairs. Bass and Stogdill (1990) indicated that every member of the group had a leadership, as it was the process of changing those capabilities and motivations to achieve that goal. Kouzes and Posner (1995) see leadership as an action by leaders to mobilize others in pursuit of shared aspirations and aspirations.

Leaders must interact with their subordinates to fulfil their organizational mandates. To this end, leaders adopt styles ranging from authoritarian to democratic, based on their philosophy or prevailing organizational culture. The relationship between leadership style and organizational processes, performance and commitment has been extensively studied, and it has been concluded that all these variables have strong positive linkages with each other. In addition, certain leadership processes, such as employee motivation, organizational

communication and decision-making, exist mainly in educational institutions. These processes are influenced or influenced by leadership style (Ryan, LaVar, & Jerlando, 2017). Several studies have indicated that motivation, communication, targeting and decision-making have a very positive impact on higher productivity in higher education institutions. These processes are considered key constants regardless of the leadership background. Satye (2004) noted that the leadership process of higher education institutions is more complicated than that of other institutions. Stakeholders in higher education institutions include students, teachers, and national and local people (Koyuncuoğlu, 2021: 342-344). Educating leaders must take into account the aspirations of all these stakeholders, so that leadership process should be sufficiently dynamic to meet the highest demands of these stakeholders (Del Favero, 2005; Chege, 2010).

The concept of e-leadership has not been explored in the same depth as that of e-management and e-governance. While the traditional definition of e-leadership is merely ICT intermediary corporate communications, it is a broader concept, including the widespread use of ICT tools to improve individual and corporate productivity and efficiency (Ryan, Lavar, & Jerlando, 2017).

Training/Development of E-Leadership and Digital Leadership

E-leadership research, primarily e-skills and e-learning outcomes for education leaders (Gomes, 2011), e-leadership style and competencies (Tan, 2010), leadership (Barwick & Back, 2007), e-leader innovation in education technology (Bowen and others, 2013) and e-leadership challenges and opportunities. No high-quality research has been conducted in this area to gain insight into best practices in e-leadership (Mcleod & Richardson, 2011).

After a comprehensive review of 77 research papers, DasGupta (2011) stated that there was a strong consensus among scientists on e-leadership and concluded that more research was needed as a new area. However, academia is also interested in “what” and “how” in the implementation of e-leadership in educational institutions (Cheol et al. 2018; Lilian 2014; Weng & Tang 2014). Most scholars believe that e-leadership education is not sufficiently researched. Liu et al. (2018) noted that virtual communication is vital for electronic leadership, but surprisingly little progress has been made in this area.

The influence of educational leadership, especially digital leadership, on educational supervision is a key issue in modern curriculum design. The teaching and learning and educational leadership realities of the twenty-first century are defined on the understanding that the effective participation of every teacher, student and stakeholder in the education sector can only be achieved through the adoption of multiple technical approaches. As a result, digital education leaders are committed to identifying, developing and implementing technical methods to change the way learning institutions operate. The digital leadership of the education sector has a number of strategic features, such as the "Bring Back Your Own Equipment" strategy at the student level, and the technology-driven professional growth strategy at the teacher and other education staff levels. At the school and external community levels, participation in digital platforms, such as social media, is also increasingly dependent. In this regard, digital leadership has permeated virtually all aspects of the education system, including educational supervision. Modern educational supervision is characterized by monitoring practices, supporting teaching development and promoting better collaboration and participation between teachers and students. It is therefore essential to explore how digital leadership can support these functions (Almudarra, 2015).

Provided that educational institutions demand to compete with other educational institutions in the digital age, strong e-leadership with ICT technical, analytical and conceptual skills is needed. Most importantly, e-leaders must have the capacity to accept e-leadership and feel comfortable testing and implementing new technological tools, as well as experimenting in computer-assisted environments (Roman et al., 2018). In addition, those who use lower-level ICT tools should be rewarded and training should be organized to develop skills. In addition, relevant educational institutions should focus on training and learning ecology, repeat awareness-raising seminars on the overuse of digitalization, take advantage of the opportunities offered by in-house technology and adopt a complete learning management system. Considering the development and enrichment of e-leadership applications, higher education leaders should strive to adopt the latest emerging ICT tools and apply them through different types of leadership. The motivation is to be able to guide employees towards organizational goals so as to achieve their aspirations and organizational goals. Work is motivated by the needs of life that must be met. These needs may include the need to earn money to meet economic needs, which may be interpreted as a desire for appreciation and further development. With all these requirements, one needs to be more actively involved in its work. It is essential to provide the motivation to do any work, as it encourages individuals

to work and remains willing to continue their efforts. Employees with high work motivation usually perform the highest. Accordingly, the leaders of institutions of higher education should endeavour to maintain the high level of motivation of their employees.

Various forms of online self-learning are provided to all age groups to support lifelong learning. To increase the productivity of students, education should make it more digital by adapting teaching methods. Therefore, all educational administrators need to be aware of digital literacy and to take effective action in the rapidly changing context of the digital age in order to manage and manage educational institutions. Digital education leaders must be willing to use digital technology and be able to apply digital technology for educational development. It is well known that digital leadership is one of the important features of the headmaster. School principals can apply digital technology on a daily basis, with educational management such as communication, public relations, brand names and participatory learning. (Sheninger, 2014).

Leadership development is a systematic process that greatly enhances the quality of leadership. According to the concept of Mezirow (2000:22), there are 10 steps of change as follows: 1) identification of confusing dilemmas, 2) self-censorship, 3) critical assessment assumptions, 4) recognition of a person's shared grievances and transformation processes, (5) exploration of options, (6) planning of action plans, (7) acquisition of the necessary knowledge and skills to act on new meanings, (8) tentative attempts on new roles, (9) development of competencies and self-confidence, (10) re-inclusion of new perspectives into your life. In Table 1, besides the Digital Leadership elements, the conceptual framework of Digital Leadership Development for Small-Scale School Principals is presented.

Universities or colleges are managed on a small scale and usually rely on four key strategies. The first is to improve management efficiency. The second is to improve the learning process and the safety of education. The third is to promote the advantages of schools. Finally, all sectors are encouraged to participate in education management. In short, the management of small teacher training, colleges or universities focuses on how to manage limited resources and achieve the highest benefits by setting strategic management standards based on the objectives of the Government and the Higher Education Council and provided by the Human Resources Policy Committee.

Table 1. Conceptual Framework of Digital Leadership Development for Digital Leadership and Small-Scale School Principals

Digital Leadership

1. Communication
2. PR
3. Branding
4. Student engagement and learning
5. Professional growth and development
6. Learning spaces and environment
7. Opportunity

Developing Transformative Learning Leadership

1. Identifying confusing dilemmas
2. Self-examination
3. Assessing critical assumptions
4. Recognizing discontent and transformation process
5. Exploring options
6. Creating an action plan
7. Acquiring the necessary knowledge and skills to act on new meanings
8. Trying new roles temporarily
9. Building skills and self-confidence
10. Reintegrating innovative perspectives

Source: Adopted from Mezirow (2000).

The administrators of the relevant educational institutions need to replace the traditional model with a new model and then try to inject it into reality. However, some important factors for success are: (1) assessing the needs of the headmasters of small schools, establishing a model of personal development, (2) allocating sufficient budget to this development, and (3) creating a specific network to keep their activities on social media or the Internet high.The basic dimensions and processes of universities must be further developed in the light of digital transformation, so that universities can achieve their digital transformation goals and develop corresponding new and changing organizational cultures of individual and collective value (Ehlers, 2021). In this regard, Ehlers (2021: 23-24) presented a framework for action on digital transformation at universities (Table 2). The framework for action is composed of three basic components: The first part allows higher education institutions to enter the digital conversion phase. The second part describes all aspects of the development of a digital transformation vision and strategy. The third part explains in detail all aspects of support for a culture that meets the requirements for digital conversion.

Digital Leadership –Action Recommendations

Positioning of the University

- Use of digital content materials and tools in teaching and student life cycle.
- Establishing binding regulations on structures and processes for the development and use of digital content in teaching.
- Providing information throughout the university on the implementation of digital teaching and the digital student life cycle.
- Integration of digital learning architecture.

Vision and Strategy for Digital Transformation

- Sharing a common vision of digital transformation across the university.
- Integration of digital transformation concepts into existing strategies and guidelines.
- Digitization becomes a part of the university's business processes and business model.
- Creation of alliances and partnerships related to the digital transformation of the university.
- Increased perceived importance of the digital architecture and digital student lifecycle at the university.

Implementation and Promotion of Digital Transformation in Universities

- Rules on safe data and copyright.
- Develop mechanisms of appreciation, encouragement and encouragement for the use of digital media and tools in the teaching/learning process and in the life cycle of digital students.
- The use of digital content and tools in the teaching process.
- Development of forums, tools and structures to share experiences and to integrate digitization into the whole university teaching and digital student life cycle.
- Developing the concept of quality for digital transformation of students'experience in teaching, management and research.
- Professionalization of teaching staff engaged in digital transformation/change management.
- Development of digital capabilities.
- Developing a mentoring system and digital practices in teaching and administration.

Source: Ehlers, 2021: 24.

University administrators often struggle to find coherent strategies for university digital transformation, opening them to the outside world. The framework for action (2021) presented by Ehlers describes the various aspects to be considered by universities wishing to

develop integrated digital conversion methods. There is a need for visibility in these areas and for an exchange of views on how future digital leadership can truly be achieved (Ehlers, 2021).

In short, the development of digital leadership needs to be self-energizing, as self-directing learning is used simultaneously with the three successful steps of learning through change. This helps to stimulate intrinsic motivation to change self-awareness in a sustainable manner. Ultimately, all restrictions can go beyond all limitations of digital technology. The principals presented new ideas for unlimited improvement in the quality of education and standards related to the complexity of multicultural societies. The following basic standards of technical leadership in higher education institutions are essential: first, various forms of financial and moral support should be provided to managers and teachers in the implementation of e-learning platforms. In this regard, university administrators should establish infrastructure for e-learning and e-learning environments; create an appropriate environment for an effective network for all users; provide psychological support to users; and make networking an incentive for staff performance appraisal. Furthermore, university administrators are to create a favorable technology leadership culture in universities in an attempt to keep pace with the latest practices in technology leadership at the highest level. In this context, the relevant boards of higher education institutions should have suitable policies that uphold the digital leadership of authorities and affiliated staff by stimulating self-development. Besides, the digital transformation process in higher education should be seen as a "comprehensive change process of organizational culture" that includes both structural and values and actions.

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Chapter 18 - The Challenges of Distance Education from the Point of View of Teachers and Mothers of Pupils with Learning Difficulties at the Primary Level

Rawan Saeed AL Qahtani, Dr. Kowthar J. Ali

Chapter Highlights

- This study aimed to identify the differences between the constraints of distance education from the perspectives of female teachers and mothers of students with learning disabilities in the primary level in the light of a list of variables: Academic level and years of experience of teachers and Acadmic, job, social, and economic levels of mothers.
- Due to the nature of the study, a comparative descriptive approach was used in this study through selecting a sample of (18) teachers and (31) mothers purposively.
- The study revealed that: there were no statistically significant differences between the constraints of distance education from the perspectives of female teachers and mothers of pupils with learning disabilities; there were no statistically significant differences between the constraints of distance education from the perspectives of female teachers of students with learning disabilities attributed to the academic level and years of experience; and there were no statistically significant differences between the constraints of distance education from the perspectives of mothers of pupils with learning disabilities attributed to the academic level, job, and social.

Introduction

Distance education so important in our time, as the world is witnessing a great and unprecedented renaissance in the field of technology, and it has become necessary to include it in all aspects of life as is happening now, and its presence in education has become necessary,‹ especially if there is an urgent need for it, when the emergence of The first crisis facing the entire world,‹ the responsible authorities in the countries of the world were forced to harness it to serve all sectors in general, and education in particular. The world is currently facing a pandemic that has claimed many lives‹ and affected the world economy‹ and has become a threat to the life of the individual, ‹ which is the Corona Virus pandemic. COVID-19 Undoubtedly, ‹ the emergence of such a pandemic requires the countries to take care of the health of their members, by taking appropriate decisions that limit the spread of this pandemic, Accordingly, the Ministry of Education decided on the twenty-fifth of the month of Dhu al-Hijjah of the Hijri year 1441 AH to launch an educational platform for the continuation of the distance education process‹ and for students, teachers and administrators to enter it‹ and continue receiving lessons through it. The existence of a new experience like this entails constraints, and difficulties. Rashwan and Shaqfa (2020) indicated that the distance education process requires several basic elements , Infrastructure is the first element, and the second element is related to the readiness of teachers, and members of education concerned with the educational process , and it varies from one teacher to another. , while the third element focuses on the target of that , which is the pupil , and the extent of his interaction with the distance education process, In addition to the above We must mention the importance of the role of parents, especially mothers. , and Al-Hussi (2006) mentioned that constraints facing educational development are the use of technological techniques to teach people with special needs; This is to help them overcome the constraints caused by the disability , and the difficulty they have, which works on their integration into school and society, In addition, the economic level of the family may constitute a challenge , and big difficulty , put the family in an embarrassing position, especially for those who had more than one son who needs electronic devices and their accessories. In addition to the above, the mother's job a major challenge, affecting the children who receive their education remotely at home , and making it difficult for her to follow her children , she may have her working hours coincide with the times of teaching children , or she may be a housewife , and she needs to complete other tasks , added to taking care of her children, and managing the rest of the household tasks, so how about those who have a several children

who receive their education remotely at home at various school levels , and how if among them pupils from have learning disabilities , it needs more time and effort , . Accordingly, it is important to highlight on constraints that face teachers and mothers of pupils with learning disabilities in distance education, so the problem of the current research was represented in the following questions:

- Is there is an increase in the degree of distance education constraints from the point of view of teachers and mothers of pupils with learning disabilities?
- Are there differences in constraints of distance education from the point of view of female teachers and mothers of pupils with learning disabilities?
- Are there differences in constraints of distance education from the point of view of teachers of female pupils with learning disabilities according to academic level?
- Are there differences in constraints of distance education from the point of view of teachers of female pupils with learning disabilities according to years of experience?
- Are there differences in constraints of distance education from the point of view of mothers of pupils with learning disabilities according to academic level?
- Are there differences in constraints of distance education from the point of view of mothers of pupils with learning disabilities according to the job (employee – housewife)?
- There are statistically significant differences in the average scores of constraints of distance education from the point of view of mothers of pupils with learning disabilities according to the economic and social level of the family.

Theoretical Framework

Distance Education

Education has gone through many stages until it reached the stage of distance education, which contributed to the continuation and development of the educational process and is one of the most important modern means introduced in the field of education and contributed to raising its value and quality. In addition, it enables all users to interact through one platform, and openness to various search sources across the web, and take advantage of them (Bertiz & Kocaman Karoğlu, 2020; Bulut & Kirbas, 2022; Hebebci, 2021; Hebebci, Bertiz, & Alan, 2020; Kaban, 2021a, 2021b; Kaleli, 2021; Kara, 2021; Sarıtaş, Börekci, & Demirel, 2022). Schlosser (2015, p. 1) defined distance education as: “Formal education in which learning groups are separated, and interactive communication systems are used to link learners,

educational resources, and teachers together." There are four basic components to this definition. If one of these axes is absent, distance education will not be completed according to what has been prepared for it, which are:

First component: This type is based on the idea of formal institutions, which makes it different from the term self or independent education. The mentioned institutions may be traditional schools or colleges, and many educators and trainers support those institutions that provide distance education, in order to increase the efficiency provided through it. Including the provision of accredited and trusted certificates through those institutions.

Second component: This type depends on the idea of distance between the teacher and the pupil, and not only spatial distance; That is, the pupil is in one place and the teacher is in another one, but this type includes temporal divergence as well. Asynchronous distance education means that education is provided at one time, and received from the pupil at another time, which means that there is flexibility in timing and in dealing based on this is appropriate between the teacher and the pupil, so it is necessary to define well the degree of spacing of time and space between the teacher and the pupil; Because teachers are completely and fully aware of the information they provide in the curriculum, which may be difficult for pupils, and here we note the importance of reducing the impact of distance to organize distance education.

Third component: Interactive communication, and this interaction is either synchronous or asynchronous, and this type is of great importance, but not at the expense of the educational curriculum. It is important to provide an appropriate interaction for learners with each other and their teachers within the educational process, and this interaction is not a priority for learning, but it must be made available to learners.

Fourth component: It is the link between the pupils, the curriculum and the teacher at the same time; In the sense that the teacher must interact with the educational resource, or curriculum, and also with the pupils; For the educational process to be of high quality, This source or curriculum must be subject to modifications and appropriate preparation in order to be suitable for this type of education, so that it is designed according to the experiences and desired goals of the educational process, and includes images, videos, and appropriate presentations.

The current research will focus on Schlosser's definition; Because it is related to the method of teaching, the type of interaction in it, the synchronization of the presentation of lessons, as well as the spatial dimension between the teacher and the pupil.

Technology and Education for people with Learning Disabilities

Computer technology tools can help pupils with learning disabilities to overcome many of the problems they face academically; That is, harnessing this technology to contribute to the educational process, but it must be known that it is not a magic solution that will eliminate all problems, but helps to solve them, including:

Primary technical applications: The category of people with learning disabilities has had a share of great development in the field of technically and technology, as applications designed for ordinary people have been developed, and they have become commensurate with the category of learning disabilities.

General computer applications: There are many applications and systems that ordinary people use, and consider them general, but they can be harnessed to teach learning disabilities, for example:

Linguistic correction system and word processor: It can be used for those who have disabilities with writing or spelling, text revision and proofreading, as well as punctuation and linguistic correction.

Spelling correction system: It helps pupils with reading and spelling disabilities by coordinating letters and spacing between words.

Expression development system: Helps the pupils to write the entire text without referring to the errors contained in the text, and then presses the button to identify the existing errors, until the pupil finishes his work without distractions that affect his completion of the text.

Organizing daily life skills system: There is a category of learning disabilities who suffer from developmental disabilities related to memory disorders. These applications help him to organize tasks and plan well for them, and then remind him of this task.

Pronunciation system for reading, writing, and spelling: Helps the pupil with learning disabilities, by operating the speaking button, and then the pupil pronounces the sound of the word clearly and audibly, Then the computer programs this sound, and writes it as a word accompanied by approach options for it, then the pupil chooses the target word (Batayneh and Al-Rashdan and Al-Sabaila and Al-Khattabah, 2009).

It was noted through the current research that a number of teachers of learning disabilities during the current period - while using distance education - prefer to use several tools such as: Comics, tutorials, presentations, interactive whiteboards, electronic game.

Previous Studies

Rashwan and Shaqfa study (2020) is one of the most recent studies that aimed to know the challenges that standing behind the use of distance education in Palestinian universities in light of the Corona pandemic. The study sample consisted of 88 members of members teaching in universities, the study used the descriptive analytical approach, and the results of the study that There is a weakness of pupils and faculty members in using distance education and computers, and this appeared specifically during the Corona pandemic in Palestinian universities. As it aimed Study of Al-Salmy and Al-Makkawi (2020) to determining the challenges to distance education for pupils with hearing disabilities, and ways to confront them during Corona pandemic. The study was applied to a sample of teachers of pupils with hearing disabilities, and their number was 391, the study used the descriptive-analytical approach, and the results of the study found that there are challenges facing male and female teachers of pupils with hearing disabilities to the schools of integration and special education. On the other hand, Al-Rantisi study (2020) aimed to identify the challenges to applying distance education in UNRWA schools from the point of view of teachers. The study sample was 366 teachers, and the study followed the descriptive approach, and one of its most prominent results was that there are significant challenges to teachers, pupils, and school principals. Also, Al-Ajaji study (2017) which sought to identify the opinions of teachers of learning disabilities about the implementation of virtual classrooms for pupils with learning disabilities in the middle school, which have not yet been covered by learning disabilities services. The study sample consisted of 20 teachers of learning disabilities, The study followed the descriptive analytical approach, and the results showed the response of the teachers of learning disabilities, and their readiness to teach the

middle level to pupils with learning disabilities, and their need for appropriate training for these classes. Also, Murad study (2014) revealed on the extent to which a sample of teachers of the Directorate of Education in Shoubak knows the basic applications and software of information and communication technology, and the extent to which they use and employ it in the subjects they study, as well as identifying the challenges that prevent their use of it, the study sample reached (101) male and female teachers. The study followed the descriptive approach, the results of the study showed that most of the sample members practice the various applications and software of information and communication technology sufficiently, but their use and utilization of it in teaching purposes, it was low. The results also revealed that there are some challenges that hinder their use of ICT in teaching; the most important of them was the lack of equipment, and the necessary infrastructure, some of which are related to lack training in how to use information technology, and communication in teaching. Abdul Haq and Yassin study (2008) Lost The aim of the study to understand the psychological and social motives of teachers towards using and adopting information technology in the educational process, and their acceptance of it. As for Abdul Haq and Yassin study (2008) , the study aimed to understand psychological and social motives of teachers towards using and adopting information technology in the educational process , and their acceptance of it .The study sample consisted of 4000 male and female teachers from Nablus governorate distributed over 244 schools , and followed descriptive curriculum , The results of the study showed that teacher's age , and English language, computer skills , Internet and software availability , and computer availability at home have a positive and strong correlation with the teacher’s belief that information technology is easy to use in the educational process. As indicated by Ghulam Study (2007) which aimed to identify the reality of using e-learning technologies at King Abdulaziz University in Jeddah, and the most important administrative and organizational challenges they face in this field. The study sample included three categories, the first is a stratified proportional random sample of (112) faculty members, and the second being a stratified proportional random sample of male and female pupils (regularity, affiliation, and postgraduate studies) numbering (1387), and the third is a selected sample of faculty members, administrators and technicians specialized in the field of e-learning, and used the descriptive analytical approach. The most important findings of the study were the low spread of e-learning techniques at King Abdulaziz University in Jeddah, Lack of qualified administrative staff to deal with modern technologies as one of the most important challenges affecting the success of the e-learning application process.

On the other hand, there are many foreign studies as the study Crescenza and others (Crescenza et al ,2021) The study aimed to explore the relationship of families with pupils and the school in light of distance education in the period of the Corona virus pandemic, and what are the skills that parents should implement; As well as analyzing the relationship of pupils with school and family during the time of teaching, and the impact of quarantine on their daily lives during the Corona pandemic period. The study was applied to a sample of 2000 teachers and their families in Italy, and the study applied the descriptive approach. The results concluded that distance education contributed to the formation of a new social system for families, schools, teachers, parents, and pupils, and this reflects the positive opinions towards distance education. The Eleni and others study (Eleni et al, 2020) aimed to implement the In SIDE) project, It is the development of distance education programs so that they are easily accessible to persons with disabilities (visual, hearing, and motor disabilities); in order to develop new programs, that are innovative and accessible, and obtain on the quality of higher education for individuals with disabilities, and the provision of flexible learning, and default navigation. The sample included individuals with different disabilities, and their number was 33 the study followed the experimental approach, in which the pre and post tests were applied, and the results indicated the effectiveness of the project that was prepared. Peroukidou & Kofou study (Peroukidou & Kofou, 2019) to explore teacher observations, and their impact on the learning process, and the progress achieved by graduate pupils who preparing the master's degree in Distance Education, in Teaching English as a Foreign/International Language offered by the Greek Open University. The study sample consisted of master's pupils in distance education, and their number reached 104 pupils and graduates. The study used the descriptive approach. The results of the study indicated that there is a difference in the pupils' opinions in favor of rejection, and the inappropriateness of the evaluation process in distance education for written tasks and assignments. The Terrazas study (Terrazas, 2018) aimed to determine the effectiveness of science was taught over three years among pupils with learning disabilities, English language learners, and general education pupils in virtual classrooms. The study sample consisted of male and female pupils from 13 schools, and their number was (2303). The study used the experimental method, and the results of the study indicated that the virtual classes deepened scientific knowledge in effectively way for all three groups of pupils.

The current research agrees with some previous studies in the use of the descriptive approach as in the study of Rashwan and Shaqfa (2020) , and the study of Al-Salmy and

Al-Makkawi (2020) , Al-Rantisi (2020), and Al-Ajaji (2017) , and Murad (2014), as well as Crescenza and others (Crescenza et al, 2021), The selection of the target sample agrees with the study of each of; Al-Ajaji (2017) and Al-Salmy and Al-Makawi (2020) study that targeted male and female teachers. However, the current research was limited to female teachers in addition to mothers, and the current research is unique from all previous studies in targeting mothers of people with learning disabilities. As well as its use variables that have not been combined before in previous studies, which are the challenges to distance education from the point of view of teachers and mothers of pupils with learning disabilities in the primary level, which in turn helps to find results, and information that differ from previous studies and research findings. The current research is one of the few studies that dealt with distance education challenges for female teachers, and mothers of people with learning disabilities in the primary level.

Research Methodology

This research follows the descriptive comparative method, and this method is based on collecting data, and testing hypotheses (Al-Khalili, 2012), It studies reality, then describes it quantitatively and qualitatively. The quantitative description in this research is used to clarify the size of this phenomenon, and the degree of its connection with another phenomenon. (Obeidat, Abdel Haq and Adas, 2007).

Research Sample

The research sample consisted of female teachers and mothers of pupils with learning disabilities in the primary level in Jubail, the number of female teachers was (18), the sample was chosen by the intentional method, The number of mothers was (31) mother.

Research Tools

For answering the research questions, and its hypotheses, and achieving its goals, a questionnaire was designed to collect data from the target sample, so the researcher reviewed the previous literature, and reviewed the tools related to the research variables, and among the most important studies were Al-Salmy and Al-Makkawi study (2020), Rashwan and Shaqfa study (2020), and Al-Ajaji study (2017). It was used in preparing a questionnaire that was

presented to a number of experts and specialists, and then applied to a survey sample of (10) in order to ensure the validity and reliability of the questionnaire. The questionnaire, in its final form, consisted of teachers' version and mothers' version (30) item, distributed over four axes in both versions: first axis: Constraints related to the educational environment, and the second axis: Constraints related to the curriculum, and the third axis: Constraints related to the teacher/mother, and the fourth axis: Constraints related to the pupils.

Results

Table1. The Level of Distance Education Constraints from the Point of View of Teachers and Mothers

General axes of the questionnaire	N	Relative average	Relative average	Standard error	T value	probability	order	direction of responses
Teachers' version								
first axis: Constraints of the educational environment	18	3.639	72.78	0.18	3.523	0.003	4	Agreement
Second axis: Constraints to the school curriculum	18	3.767	75.33	0.19	4.004	0.001	3	Agreement
Third axis: Teacher constraints	18	3.809	76.18	0.11	6.900	0.000	2	Agreement
Fourth axis Pupils constraints	18	3.879	77.58	0.18	4.813	0.000	1	Agreement
The general direction of the resolution	18	3.774	75.48	0.13	5.739	0.000		Agreement
Mothers' version								
first axis: Constraints of the educational environment	31	3.475	69.51	0.11	4.22	0.000	4	Agreement

Teachers' version								
General axes of the questionnaire	N	Relative average	Relative average	Standard error	T value	probability	order	direction of responses
Second axis: Constraints to the school curriculum	31	3.723	74.45	0.13	5.66	0.000	2	Agreement
Third axis: Mother constraints	31	3.742	74.85	0.13	5.66	0.000	1	Agreement
Fourth axis Pupils constraints	31	3.566	71.33	0.12	4.77	0.000	3	Agreement
The general direction of the resolution	31	3.626	72.52	0.10	6.07	0.000		Agreement

Table 2. (t) Value of the Differences between the Average Responses on the Axes and the Total Score for the Female Teachers and Mothers

Viewpoints and Axes		**Sample**	**average**	**Standard error**	**T value**	**Statistical significance**	**Conclusion**
First Axis	Mothers	31	3.475	0.11	-0.809	0.423	There are no statistically significant differences
	Female Teachers	18	3.639	0.18			
Second Axis	Mothers	31	3.723	0.13	-0.199	0.843	There are no statistically significant differences
	Female Teachers	18	3.767	0.19			
Third Axis	Mothers	31	3.742	0.13	-0.343	0.733	There are no statistically significant differences
	Female Teachers	18	3.809	0.12			
Fourth Axis	Mothers	31	3.566	0.12	-1.496	0.141	There are no statistically significant differences
	Female Teachers	18	3.879	0.18			
Total score of the tool	Mothers	31	3.626	0.10	-0.872	0.388	There are no statistically significant differences
	Female Teachers	18	3.774	0.13			

Table 3. (t) Value of the Differences between the Average Responses on the Axes and the

Total Score

Viewpoints and Axes		Sample	average	Standard error	T value	Statistical significance	Conclusion
First Axis	Bachelor's Degree	13	3.585	0.23	-0.471	0.644	There are no statistically significant differences
	Master's Degree	5	3.780	0.28			
Second Axis	Bachelor's Degree	13	3.646	0.23	-1.016	0.325	There are no statistically significant differences
	Master's Degree	5	4.080	0.36			
Third Axis	Bachelor's degree	13	3.901	0.14	1.288	0.216	There are no statistically significant differences
	Master's Degree	5	3.570	0.22			
Fourth Axis	Bachelor's degree	13	4.033	0.20	1.399	0.181	There are no statistically significant differences
	Master's degree	5	3.478	0.38			
Total score of the tool	Bachelor's degree	13	3.792	0.17	0.205	0.840	There are no statistically significant differences
	Master's degree	5	3.728	0.25			

Table 4. The Results of the Analysis of Variance and the (F) Value of the Differences between the Average Responses on the Axes and the Total Score

Viewpoints and Axes		Sample	average	Standard error	F value	Statistical significance	Conclusion
First Axis	Less than 3 years	3	3.933	0.38	2.167	0.149	There are no statistically significant differences
	3-5 years	3	4.300	0.31			
	More than 5 years	12	3.400	0.22			
Second Axis	Less than 3 years	3	3.800	0.40	1.193	0.330	There are no statistically significant differences
	3-5 years	3	4.400	0.31			

Viewpoints and Axes		Sample	average	Standard error	F value	Statistical significance	Conclusion
	More than 5 years	12	3.600	0.25			
Third Axis	Less than 3 years	3	3.710	0.00	1.069	0.368	There are no
	3-5 years	3	4.190	0.37			statistically
	More than 5 years	12	3.738	0.15			significant differences
Fourth Axis	Less than 3 years	3	3.963	0.46	0.161	0.852	There are no
	3-5 years	3	4.087	0.40			statistically significant differences
	More than 5 years	12	3.806	0.24			
Total score of the tool	Less than 3 years	3	3.853	0.30	1.482	0.259	There are no
	3-5 years	3	4.247	0.19			statistically significant differences
	More than 5 years	12	3.636	0.17			

Table 5. The Results of the Analysis of Variance and the F Value of the Differences between the Average Responses on the Axes and the Total Score. Discussion:

Academic level and Axes		Sample	average	Standard error	degree of freedom	F value	Statistical significance	Conclusion
	Primary	7	3.416	0.278	3	0.262	0.852	There are no statistically significant differences
	Middle	3	3.760	0.120				
First Axis	Secondary	12	3.500	0.226	27			
	Bachelor's Degree	9	3.394	0.138				
Second Axis	Primary	7	3.400	0.302	3	0.614	0.612	There are no statistically significant differences
	Middle	3	3.867	0.240				
	Secondary	12	3.783	0.219	27			
	Bachelor's Degree	9	3.844	0.226				
Third Axis	Primary	7	3.620	0.257	3	1.059	0.383	There are no statistically
	Middle	3	3.780	0.110				

Academic level and Axes		Sample	average	Standard error	degree of freedom	F value	Statistical significance	Conclusion
	Secondary	12	3.543	0.242	27			significant differences
	Bachelor's Degree	9	4.091	0.228				
Fourth Axis	Primary	7	3.556	0.268	3	0.195	0.899	There are no statistically significant differences
	Middle	3	3.293	0.274				
	Secondary	12	3.585	0.231	27			
	Bachelor's Degree	9	3.641	0.180				
Total score of the tool	Primary	7	3.497	0.249	3	0.236	0.871	There are no statistically significant differences
	Middle	3	3.673	0.157				
	Secondary	12	3.602	0.204	27			
	Bachelor's Degree	9	3.743	0.138				

Table 6. The Value of (t) and its Statistical Significance for the Differences between the Average Responses on the Axes and the Total Score

Viewpoints and Axes		Sample	average	Standard error	T value	Statistical significance	Conclusion
First Axis	Housewife	21	3.438	0.155	-0.481	0.634	There are no statistically significant differences
	employee	10	3.555	0.136			
Second Axis	Housewife	21	3.562	0.168	-1.901	0.067	
	employee	10	4.060	0.133			

Viewpoints and Axes		Sample	average	Standard error	T value	Statistical significance	Conclusion
Third Axis	Housewife	21	3.801	0.148	0.648	0.522	There are no statistically significant differences
	employee	10	3.618	0.270			
Fourth Axis	Housewife	21	3.490	0.157	-0.930	0.360	There are no statistically significant differences
	employee	10	3.727	0.165			
Total score of the tool	Housewife	21	3.572	0.141	-0.752	0.458	There are no statistically significant differences
	employee	10	3.739	0.120			

Table 7. The Results of the Analysis of Variance and the (F) Value of the Differences between the Average Responses on the Axes and the Total Score

Viewpoints and Axes		Sample	average	Standard error	degree of freedom	F value	Statistical significance	Conclusion
First Axis	Low	7	3.611	0.216	2	0.521	0.600	There are no statistically significant differences
	Middle	20	3.482	0.156	28			
	High	4	3.205	0.131				
Second Axis	Low	7	3.514	0.265	2	0.404	0.671	There are no statistically significant differences
	Middle	20	3.800	0.174	28			
	High	4	3.700	0.173				
Third Axis	Low	7	3.716	0.235	2	0.036	0.965	There are no statistically significant differences
	Middle	20	3.767	0.176	28			
	High	4	3.665	0.392				
Fourth Axis	Low	7	3.591	0.275	2	0.325	0.725	There are no statistically significant differences
	Middle	20	3.609	0.157	28			
	High	4	3.313	0.157				
Total score of the tool	Low	7	3.607	0.217	2	0.182	0.834	There are no statistically significant differences
	Middle	20	3.664	0.139	28			
	High	4	3.471	0.184				

Discussion

In Table (1), when comparing the arithmetic average of the responses to the dimensions of the tool in both versions and the total score for them with the theoretical average of the responses, all (T) values came at a statistical significance level less than (0.05 - 0.01). Which indicates the existence of statistically significant disabilities between the average responses on the dimensions of the tool and the total score for them on the hypothetical neutral average,

and here it can be said that the degree of distance education constraints from the point of view of the teachers and mothers of pupils with learning disabilities increases about the degree of the average (neutral) on the dimensions of the tool (teachers' version – mothers' version) and the total score for them, accordingly the alternative hypothesis was accepted, and the null hypothesis was rejected. The previous result is due to the high constraints of teachers and mothers due to several reasons related to the nature of education in the Kingdom of Saudi Arabia, which depends to some extent on paper books and notebooks and does not use the computer outside the classroom or in homework, which makes the use of the computer as a source of education at a certain stage. It is a major obstacle for teachers and mothers. It is clear from the results in Table (2) that there are no significant statistically significant differences between the average responses between female teachers and mothers to the four axes of learning constraints and to the total degree of the tool, and all statistical values are much higher than the statistical significance (0.05<2), and therefore the alternative hypothesis was rejected, and the null hypothesis accepted , The previous result is attributed to the nature of the conditions to which education was subjected, and the period of time during which the situation required the urgent application of distance education without prior warning, and the importance and urgent necessity of the matter. There would have been training, setting appropriate plans, devising programs and educational tools that support the education process that would help all female teachers and mothers use distance education in a better and more qualitative manner. It is clear from the results in Table (3) that there are no significant statistically significant differences at the level ($\alpha < 0.05$) Among the average responses of female teachers to the constraints of distance education from their point of view, according to the academic level (Bachelor-Master), the calculated (T) value was less than the tabular (T) axis for the first, second, third, and fourth axis, and for the tool as a whole (teachers version), and the statistical significance value was much higher than the level of Statistical significance (0.05), and therefore the alternative hypothesis is rejected, and the null hypothesis is accepted, The results are in agreement with the study of Rashwan and Shaqfa (2020), which indicated a weakness in the use of Distance education for pupils and faculty members of various degrees, as learning through distance education requires skills that they were not trained according to a certain methodology, so that it would be an easy experience for everyone. Female teachers at all academic levels have constraints in distance education for people with learning disabilities, The results came in Table (4) that there were no significant differences between the average groups' responses to distance education constraints from the point of view of the female teachers of pupils according to the years of

experience, where the value of the statistical significance was higher than the level of statistical significance (0.05). which means that there are no statistically significant differences, and therefore the alternative hypothesis is rejected, and the null hypothesis is accepted. It is clear from the results in the fifth table that all the calculated (F) value is less than the tabular (F) value, as the statistical significance values of the tool axes were totally much higher than the level of statistical significance (0.05), The alternative hypothesis is rejected, and the null hypothesis is accepted.

The previous result is attributed to the fact that female teachers of pupils with learning disabilities, despite their great use of technology in teaching people with disabilities, which hardly teaches a lesson, but that distance education as the only method of education is not enough, which means that the constraints for female teachers is the rely on distance education as the only method, and the absence of The aspect of the presence education, and the gradation from the tangible to the abstract, and it is not possible to do it through distance education. It is clear from the results in Table (5) that all the calculated (F) value is less than the tabular (F) value, as the statistical significance values for the axes of the tool as a whole and for the tool as a whole, respectively, were much greater than the level of statistical significance (0.05), Accordingly, the alternative hypothesis is rejected, and the null hypothesis is accepted, and these results are attributed to the fact that distance education is one of the most modern things for pupils and their families, and this constitutes a challenge to all groups of society and learners at their various levels, and this method requires adequate training for mothers and pupils, so it is not possible to learn it quickly in a short period of time, it is easy. It was stated in the results of Table (6) that the calculated (t) value is less than the tabulated (t) value for the first, second, third, and fourth axis, and for the tool as a whole, and the statistical probability value was higher than the significance level value (0.05), accordingly the alternative hypothesis is rejected, and the null hypothesis is accepted, This result is due to the fact that the constraints to distance education from the point of view of mothers, whether they are an employee or a housewife, are generally due to the type and hours of distance education. When it is said that the mother, the housewife, faces constraints, it is expected that this will depend on the nature of the family and the number of its members. A mother who has many children need care and attention, as well as various household affairs that require effort, time, and endurance to enable her to complete them. It is clear from the results of Table (7) that there are no significant differences between the average groups of distance learning constraints from the point of view of mothers according to the economic

and social level of the family, where the statistical probability value was for the first, second, third, and fourth axis, and for the tool as a whole, respectively; much higher than the significance level (0.05), Accordingly the alternative hypothesis is rejected, and the null hypothesis is accepted, This result is attributed to the fact that distance education affects all families of all classes and capabilities, and for those who have a son who suffers from learning disabilities, and this may be because of the prices of electronic devices, the prices of Internet packages, and network boosters inside the home, as well as the prices of media and paper printers for pupils with learning disabilities in order to solve the exercises, activities and skills required.

Conclusions

- There is an increase in the degree of distance education constraints from the point of view of teachers and mothers of pupils with learning disabilities.
- There are no statistically significant differences in the average degrees of distance education constraints from the point of view of teachers and mothers of pupils with learning disabilities.
- There are no statistically significant differences in the average degrees of distance education constraints from the point of view of female teachers of pupils with learning disabilities according to the academic level.
- There are no statistically significant differences in the average degrees of distance education constraints from the point of view of female teachers of female pupils with learning disabilities according to years of experience.
- There are no statistically significant differences in the average degrees of distance education constraints from the point of view of mothers of pupils with learning disabilities according to the academic level.
- There are no statistically significant differences in the average degrees of distance education constraints from the point of view of mothers of pupils with learning disabilities according to the job (employee - housewife).
- There are no statistically significant differences in the average degrees of distance education constraints from the point of view of mothers of pupils with learning disabilities according to the economic and social level of the family.

Research Recommendations

- Providing training courses for teachers and mothers about distance education and dealing with its requirements within the educational platform.
- Employing the role of technical support in training female teachers to manage distance education and technical troubleshooting.
- Providing programs that help teachers choose the appropriate medium for each lesson of pupils with learning disabilities.
- School administrations provide several options for study schedules that suit the working hours of mothers in their various jobs.

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Chapter 19 - Cognition and Regulation in Physics Learning: Does Inherent Metacognition Predict Students' Performance?

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Chapter Highlights

- The position of educators, literature and beyond on metacognition and its influence on students' performance remains a debate in learning parlance.
- Scholars favoured metacognitive trainings to improve students' performance while others posited the alternate.
- This pattern necessitates emerging researches in the field to investigate using different approaches with a view to add to existing body of knowledge.
- This study employed co-relational type of ex post facto research type in examining students' inherent metacognitive components against physics performance in predictive paradigm.
- This study sampled purposively eight hundred and fifty-seven (857) senior secondary school III students.
- Students' Metacognitive Inventory I & II elicited data for metacognition while performance of candidates in West African Senior School Certificate Examination in physics serves as the correlate.
- Three research hypotheses were formulated and tested.
- PPMC and MANOVA statistical tools were employed for analysis of data. Influence of gender and school type on both metacognition and students' performance in physics were further examined in this study at 5% level of significance in the study.

Introduction

The decision to learn remains a conscious process to learners in both science and non-science fields. What each learner brings to play in learning differs (Kang & Keinonen, 2018; Zamora & Ardura, 2014). Science as a field of study has been identified as challenging. Several rudiments and peculiarities are adhered to in overcoming barriers associated with learning principles, methods and rudiments aboriginal to science and by extension all forms of education (McCarthy, et al., 2022; Pierard, et al., 2022; Regmi & Jones, 2020). Physics, among other sciences, as reported in the literature, is one of the most difficult subject/disciplines for learners at various levels of science learning (Cochran, et al., 2018; Gudyanga, et al., 2015; Suyidno, et al., 2020; Yehya, et al., 2018). This acknowledged, challenges territorial to the teaching of physics, as well as, its learning has a place in the literature for decades (Keller, et al., 2017; Osborne et al., 2003). Similarly, students studying physics at every level must be assessed through examinations at all levels to ascertain learning regardless of several identified challenges needing remediation as countenanced by scholarly positions in the literature (Byoung-Suk, et al., 2017; Francisco, & Celon, 2020; Gerard, et al., 2017; Kim, & Seo, 2018).

Students' poor performance in physics is a concern to educators globally. This concern transcends race, gender, economic class and ability levels (Bogdanović, et al., 2021; Gudyanga et al. 2015; OECD, 2019a, 2019b; UNEB, 2017). Several factors are responsible for this under-performance (Badmus & Jita, 2022; OECD, 2019b). School related factors (UNEB, 2017), teacher related factors (OECD, 2013; Ramnarian, 2014), student related factors (Keller et al., 2017; Potvin & Hasni, 2014). Despite the multi-dimensional nature of these problems, the essense of education remains to profer solutions through scientifically proven means. Efforts to remediate students' under-performance in physics with focus on students' related factors is the direction of this manuscript. For students to perform better in physics, they must understand their learning process and become active partakers (Ohtani & Hisasaka, 2018; Ozturk, 2017). "Knowing how to know" rather "learning how to learn" becomes imperative as a skill for self-regulated learning (Zimmerman & Labuhn, 2012). This skill becomes imperative owing to occasional interruptions in learning activities by external influence, such as; pandemic, disruptions in school activities by strike action, unwarranted holidays, and short practices in teaching (Schraw, et al., 2012; Thomas, 2013). Students are often the victims of the afore-listed.

Self-regulated learning presents various challenges from non-linear (the need to cater for individual difference), multi-representational (various approach), open-ended learning involving certain self-regulatory procedures such as; reflection, planning, cognitive monitoring and regulation (Ohtani & Hisasaka, 2018; Ranalli, 2018). It may be unusual for students to incorporate monitoring and regulation in their learning, which may limit their performance (Onu, et al, 2012). It is expected that the drive towards optimum performance in physics and ultimately in the production of a workforce versatile in the development of modern technologies should be priority to stakeholders (FRN, 2013; UNEB, 2017). The application of the knowledge of physics and its principles has aided solutions to human every day challenges. As such, aggregating learning approaches to arose the consciousness of learners may proffer a lead to better performance in physics through - how their learning takes place 'knowledge of cognition' and 'regulation of cognition' (Kang & Keinonen, 2018; Zamora & Ardura, 2014).

Metacognition refers to the ability to employ prior experience to plan a strategy for approaching a learning task by undergoing rudimentary procedures steps in solving such problems (Brown, 1987; Flavell, 1987; 1979; 1976). Reflection and evaluation as well as modification of present approach, if need be, to accomplish a task is metacognition (Zimmerman & Labuhn, 2012). Similarly, metacognition is "learning how to learn, thinking how to think and knowing how to know". The word "metacognition" emanated from Flavell (1976) to describe self-awareness and self-regulation of knowledge. Similarly, individuals' awareness of own cognitive structure and learning characteristics is termed metacognition (Al Banna, et al, 2016). How learners decide the strategy to engage a particular problem? In which instance as a result of their prior experiences? Strategizing, monitoring learning, evaluating and updating strategy when learning has not taken place characterized metacognition as self-regulated learning (Thomas, 2013; Zamora & Ardura, 2014). Metacognitive learners "know what to do and how to do it", that is, they are equipped with knowhow in discovering new knowledge (Harrison & Vallin, 2018; Schraw, et al., 2012).

The previous paragraphs provide introduction; however, it is imperative to introduce this audience to what makes up physics performance in this study. Paying adequate to the methodology exposed, in this case ex post facto. Three years education at the senior secondary level exposes students to external examination called West African Senior School Certificate Examination (WASSCE). This examination is conducted by the West African Examinations Council (WAEC). An independent council which conducts examinations in 5

of the west African countries with similar curriculum. Gambia, Ghana, Liberia, Nigeria and Sierra Leone consitute the members. The council was established in 1952 with her regional headquarter in Accra, Ghana. We collated results of students in physics as physics performance after which metacognition was examined retrospectively. This examination scores were the denominator for comparison as the examination is done across the 5 countries at the same time. The examinations are reliable, standardized and valid for ordinary level requirement in higher institutions of learning across the world (WAEC, 2020).

Theoretical Background

This study is founded on Flavell's theory of metacognition. John Flavell authored the theory of metacognition through inspiration from Jean Piaget's book, The Developmental Psychology. Metamemory was conceive to explain the ability to manage input, store and retrieve information from the memory. The word metacognition was coined three decades later to imply intentional/conscious cognitive process directed at accomplishing a set goal (Favell, 1987; 1979; 1976). In the context of this manuscript, we explore consciously the effort directed at learning physics by learners. In effect, learning physics should be intentional. We investigate the mind on how it accepts the knowledge of physics, apply and regulate for the correct outcome. As outline by Flavell, metacognitive activity precedes cognitive activity with mutual dependence (Flavell, 1987). Metacognitive knowledge may lead an individual to engage or abandon a cognitive process. How to engage for the desired outcome and method/approach are all metacognitive endeavours. Learners in this case are exposed to reasonable number of definitions formula and mathematical processes which must be consciously attended to elicit outcomes.

Literature Review

Motivation profile of secondary school physics learners was investigated by Kwarikunda et al. (2021). The study explores the relationship among cognitive learning strategies, gender, attitude and interest of students with respect to their motivation for physics learning. A descriptive approach was employed by the researcher in the use of Latent Profile Analysis (LPA). The study sampled nine-hundred and thirty-four Grade 9 students from 8 secondary schools in Uganda. Motivational profile of respondents was categorised into six levels based on their learning abilities. The study found that students who use surface learning were

among the grade-introjected motivated and low-quantity students while primarily intrinsically motivated and high-quantity students indulge in deep learning strategies. The study concluded that individual differences influence learners' motivation in physics learning. Interest and attitude predicted the profile of learners in the study unlike gender.

Dindar et al. (2020) researched the relationship between metacognitive experiences and collaborative problem solving among 77 higher education students in Finland. Collaborative problem solving (CPS) simulation and metacognitive experiences were the instruments which were measured at multiple time points during collaborative problem solving. Perceived metacognitive experience and perceived performance was analysed using pathway analysis. It was found that complex relationship exists between metacognitive experiences and performance in CPS which further highlighted social components of metacognition. Ohtani and Hisasaka (2018) researched on meta-analysis among metacognition, intelligence, and academic performance. A correlational study which examined relationship among metacognition, intelligence and academic performance of students among one hundred and forty-nine articles. It was reported that one hundred and eighteen elicited a weak correlation between intelligence and academic performance. Although, this study refers higher order thinking as metacognition which was reported to be a significant predictor of students' academic performance. Similarly, metacognition was found to have predicted students' academic performance when controlling for intelligence. It was concluded that metacognition remains an important component of educational practice and should guide students learning in and outside the classroom.

A theoretical and practical approach to metacognition was done by Ozturk (2017). In the study, supporting students' metacognitive development was primed over adequacy and appropriateness of the process. A short review was conducted by the researcher to establish the state of literature with regard to metacognitive development, how to assess? Its limitations, measures and procedure. A meta-analysis of ten studies to examine pattern was portrayed. Evident from the study, knowledge of cognition and regulation of cognition were both assessed simultaneously as theory of metacognition. Off-line measures were taking for the knowledge of cognition while both on-line and off-line were employed with the regulation of cognition. After a comparative analysis, the study found that metacognition assessment utilized domain-specific assessment or occasional real-life tasks.

Callender, et al. (2016) examined ways to improve metacognition through classroom training,

instruction and feedback. The study sampled a hundred and twenty-seven undergraduates in higher classes. From historical data, students were asked to judge their performance in two courses. The predicted performance was compared with the actual performance after being tutored on concepts like overconfidence, measuring feedback and skills for calibrating accurate score in the exam. The study reported that low ability students overestimated the outcome of their performance while high ability students underestimated their outcome in similar examinations. This position was regarded as Kruger and Dunning effect. After the stimulus instrument, students from the two categories were able to switch their judgement of performance such that their metacognitive accuracy was significantly improved from their first to second examination. A similar process was extended for two additional semesters for the same study. No feedback was provided in one of the two semesters allowing for the possibility to improve performance coupled with reduction in overconfidence on the second exam except for students who got feedback for their performance and judgements. Metacognition was found to be significant for both low and high performing students in the study as it allows for mental moderation and accuracy of outcomes in examinations.

Cornoldi, et al. (2015) worked on ways of improving metacognition and working memory through training programme among primary school pupils with a view to improve their problem-solving skills. The researchers reported doubts in the test of efficacy as similar studies have reported no significance in this direction. As outlined, recent studies focused on working memory and cognitive ability of students in particular. While the aim was to train pupils unlike other studies which focused on testing efficacy of metacognition and working memory on pupils' performance. This study made systemic effort to train pupils on underlying abilities of pupils with a view to motivate, boost confidence and improve their competence for all round development.

Bannert, et al. (2015) examined short- and long-term implication of learners' self-directed metacognitive pulses on navigation behaviour and learning performance. The research was carried out in a computer-based environment which allowed for learners to utilize a metacognitive prompt that is self-directed. The study permit students to develop a metacognitive framework of their own allowing learning to place concurrently. The study adopted an experimental design of pre-test and post-test. Both the control and experimental group had 35 students each. The experimental group were tasked with configuring their metacognitive prompt by themselves before learning. The controlled group were without

metacognitive prompt. From the analysis of data, students in the experimental group were able to streamline their search to relevant webpages and spent more time studying than those in the control group. Also, those in the experimental group transferred performance after learning than those in the control group. A consistent effect in performance transfer was experienced among those in the experimental group.

Sawhney and Bansal (2015) researched the relationship between metacognition and academic performance of undergraduate students. One hundred undergraduates formed the sample from colleges in Chandigarh, India. Metacognition Inventory was employed to measure the metacognition. The study found significant difference in the performance of undergraduates with high and low scores in metacognition. Jayapraba (2013) examine cooperative and metacognitive learning strategies on students' performance in science. Quasi-experimental design was employed with two experimental groups (cooperative learning and metacognitive instructions group) and the control group. Researcher design performance test was administered on 'Human Anatomy' and lasted 11 weeks among the three groups. Metacognitive instructions had most effect in enhancing academic achievement in the study. With multiple regression analysis, it was established that significant relationship exist between metacognition and achievement. Metacognitive instruction was recommended in the study to help students learn efficiently and enhance their academic achievement.

RaniI and Govil (2013) researched undergraduates' students' academic performance with respect to parent education, gender, living standard and academic performance. The sample was 313 undergraduates from Aligarh District. Metacognitive inventory (MCI) was employed in measuring metacognition of undergraduates while 't' test and ANOVA were statistical tools used in the analysis. Gender in the study had no significant influence on metacognition. Conversely, undergraduates form urban area had superior metacognitive level to those from rural area in the study. İn conclusion, high and low ability students differ significantly on their metacognitive level. Narang and Saini (2013) investigated the effect of metacognition on students' performance among rural adolescents between the ages of 13-16 years. The study sampled 240 adolescents distributed equally over four grades (7th, 8th, 9th and 10th grade) recognising gender and socio-economic groups. A self-constructed questionnaire on metacognitive skills adapted from another instrument was administered to participants. A pro forma of students' academic performance of the subjects was obtained from the last school examination from the teachers. From the analysis, both knowledge of cognition and

regulation of cognition significantly contributed to the academic performance of the respondents.

Ciascai, et al. (2011) conducted a study among Romanian 8th grade pupils. A total of 90 students participated in the study from three schools. Male students were 61.1% and female 38.9%. The Junior Metacognition Inventory (Jr. MAI) was employed with two scales on both regulation of cognition and knowledge of cognition having 18 statements with reliability index 0.78. a significant gender influence was observed on metacognition with most differences emerging from knowledge of cognition than regulation of cognition. McCabe (2011) examined six empirically supported learning among undergraduates. The inability to predict learning outcomes of educational scenarios describing the strategies of static-media presentations, dual coding, testing, low-interest extraneous details, and spacing were variables of concern. The study found weak approval for strategies strategy in generating one's own study materials. Also, a measure of metacognitive self-regulation was found to correlated with performance scenario. Consequently, higher prediction accuracy was found among students who received targeted instruction in applied memory topics during their psychology courses. The research further reported that undergraduates are most of the time unaware of specific strategies which could benefit their memory for course information.

Contribution to Knowledge

This study gravitates on examining whether metacognition requires conscious training (learning) of the mind or the inherent metacognitive traits are sufficient to improve students' performance unlike previous studies. We investigated whether the three years of formal instruction is sufficient to build knowledge of both cognition and regulation in metacognitive abilities of students for better performance. An instrument was domesticated (Adaptive) to evaluate what learners bring into play when solving physics problems (knowledge of cognition and regulation of cognition with attendant components). The locale for this study is yet unlike previous studies. Students' performance in physics in this study employed a comprehensive yet retrospective method to elicit data for students' performance in physics (Co-relational ex post facto). Participants underwent three years of secondary education under the same syllabus and wrote the same standardised exam by West African Examinations Council (WAEC- conduct unified exam at the same time among registered students of Nigeria, Ghana, Sierra Leone, Gambia and Liberia) at the same time without

interference. Students Metacognitive Inventory (SMI I & II) was culturally adapted and administered at six weeks to the external examination which examined the overall topics and concepts taught in physics curriculum of senior secondary schools in West Africa over the space of three years. Unlike studies under review which were testing aspects (topics) in physics and in other instances premeditated atmosphere orchestrated within a short period to elicit data, no performance test was administered to respondents, as such, contamination, anxiety and content-moderated outcomes were bypassed by design. Uniquely, the approach devised had no interruption to usual classroom activities which is unusual in the studies under review. To date, the research is yet to encounter a study which investigated inherent metacognition (with stratified and culturally moderated inventory) and students' performance in physics on account of syllabus in its entirety.

Methodology

Design

We employed co-relational *ex post facto* research in this study. In effect, it studies similar groups whom have undergone the same learning experience with the exception of the same outcome- see chapter 20, pp 418-426 of Research Methods in Education (Cohen, et al., 2018). Subjects are not randomly assigned, rather, are selected purposively owing to peculiar characteristics. No direct control over the dependent variable, testing for the relationship with independent variables was observed.

Sampling

Senior school III (SS 3) students with age range between 15-17 years form the target population. The initially intend to sample sixteen (eight public and eight private) senior secondary schools in each of the six geopolitical zone. Some issues hindered the intent of this study. Insecurity and uneven distribution of public-schools that met the criteria for this study. Similarly, the willingness of the schools to participate and also make available West Africa Senior School Certificate Examination (WASSCE) results. The choice of SS III students suits this study because majority of the syllabus is expected to have been covered at this stage. Students at this stage write an examination that is universal across all the sampled districts and possess traceable traits of the variables considered in this study.

We ignored the four zones with security challenges as it is obvious that the outcome of their result may contaminate the result of other zones. After field survey of schools which met the criteria for participation in the two other zones (South-west and South-east), the researcher discovered an uneven distribution of willing participants as not all schools were comfortable with the terms earlier stated. Learners for a fact are the focus of this study, the researcher took the discretion of sampling only schools willing to provide requisite data for this study. Furthermore, participating schools' students were ethically required to take home to their parents a consent form detailing the requirements of this research. We employed purposive sampling technique in the selection of schools that met the criteria enumerate. This study sampled 857 students from twenty-two (22) senior secondary schools from two zones. Intact classes of the selected schools were involved in the study. In identifying eligible schools for this study, the researcher took into cognizance the following factors: participating schools must have been in existence for not less than ten years; participating schools must have at least ten physics students in SS III and at least three female students in the same class; participating schools must have at least a qualified physics teacher; participating schools must be willing to provide WASSCE result of students in physics and, participating students must have promoted from SS II to SS III in the same school.

Instrumentation

West African Senior School Certificate Examinations results of participants formed the pro forma (physics performance) as primary data. Students' Metacognitive Inventory (SMI I & II) by Dr Punita Govil (2003) was adapted for this study. The adaptation came in form of language simplification and moderation of statements in cases of repetition and relativity. The moderated instrument contains 30 statements to elicit data on knowledge and regulation of cognition. SMI was divided into two seamless sections. SMI-I tested for cognitive Knowledge while SMI-II tested for regulation of cognition. SMI-I consisted of three main sections, which are; declarative knowledge, procedural knowledge and conditional knowledge. Each of these sections had five questions with a total of 15 questions. SMAI-II consisted of five sections, which were; planning, information management strategy, comprehension monitoring, debugging and evaluation. Each of the five sections had three questions each with a sum of 15 questions. SMAI-I and SMAI-II had a total of 30 questions.

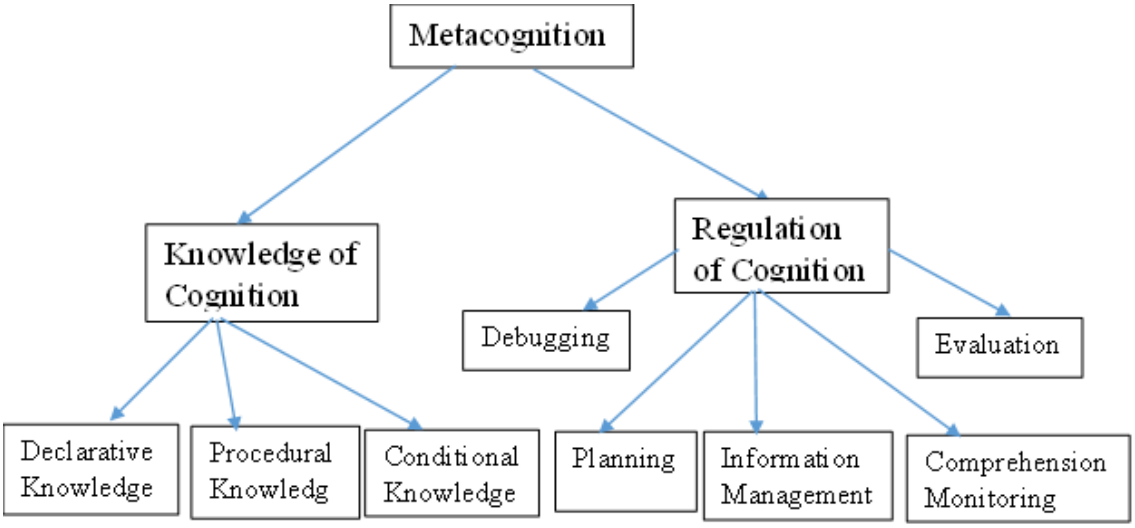

Figure 1. Metacognitive Hierarchy as measured in the Study.

Rating scale for SMI

Strongly Aware= 4, Aware= 3, Unaware= 2, Strongly Unaware= 1

The researcher indulged experts (three educational psychologist) in the adaptation of the instrument. The following aspects were moderated; clarity of the terms and instructions, language modification, relevance and adequacy of the items in the instrument. In a pilot study to ascertain the reliability of the instrument, we involved two senior secondary schools (one public and one private) which are outside the scope of the study. Test-retest method was employed in the administration of SMI (I & II) at an interval of two weeks. Pearson's product moment correlation statistical tool was employed to compute the reliability index which was 0.78.

Ethical Consideration

Ethical approval for the study was obtained from the Postgraduate School of the University of Ilorin, Ilorin, Nigeria. After a review of the procedure for data collection and relevant document- instruments (SMI I &II, consent forms and letter of introduction), this study was issued a protocol approval number- UERC/ASN/2018/1291 and Protocol Identification Code- UERC/EDU/245 after a year from date of application and moderation. Then, consents of students and by extension their parent were sought before the administration of the instrument. Students Metacognitive Inventory (SMI I & II) were administered to the students and lasted for 30minutes, indicating 15minutes for SMI-I and 15minutes for SMI-II based on

pilot testing that was previously done outside the scope of this study. The researcher employed the services of four research assistants in addition to the subject teachers to enhance the distribution, collection and collation of the instrument. The assistants were trained in two days on code assignment to participants and collation of filled inventory. Research assistants were also briefed on time expected for students to answer each of the instrument, the sequence of the instrument, the role of the teacher/s and coding of the instrument and the pro forma to avoid violation of ethical issues.

Results

The data on Table 1 presents the demography of respondents based on Gender and School type. This revealed that out of the 857 students that completely participated in the study, 428 students (49.9%) were male students, while 429 students (50.1%) were female students. This implies that more female students participated in this study. Table 1 further revealed that, 531 students representing (62.0%) were from public secondary schools, while 326 students representing (38.0%) were from private schools. This indicates that greater percentage of respondents were from public secondary schools.

Table 1. General Distribution of the Respondents by Gender and School Type

Variables	Frequency	Percentage (%)
Gender		
Male	428	49.9
Female	429	50.1
Total	**857**	**100.0**
School Type		
Public	531	62.0
Private	326	38.0
Total	**857**	**100.0**

H_{O1}: *Inherent metacognition will not significantly predict students' performance in Physics.*

To test research hypothesis one, participants' responses to Students' Metacognition Inventory and WASSCE results in Physics were collated and analysed as shown on Table 2. The calculated r-value was 0.002 showing a weak correlation while its calculated significance

value is 0.95 and df of 2/855 at alpha level of 0.05. Consequently, null hypothesis one was not rejected. This means that students' un learned metacognition did not significantly predict their performance in Physics. This decision is arrived at because the calculated significance value (0.95) was greater than 0.05 alpha level (**ρ** > 0.05).

Table 2. PPMC Analysis of Prediction between Students' Inherent Metacognition and their Performance in Physics

Variable	No.	Mean	Std	df	Cal.r	Sig.(2-tailed)	Decision
Students' Metacognition	857	100.02	9.57				H_{01}
				855	0.002	0.95	Not
Physics Performance	857	64.01	10.87				Rejected

ρ > 0.05

H_{O2}: *Gender influence will not be significant in the prediction between students' inherent metacognition and physics performance.*

In order to test hypothesis three, participants' responses to Metacognition Inventory, WASSCE result in Physics were collated and analysed based on gender as shown in Table 3.

Table 3. Multivariate Analysis of Gender Prediction on Students' Inherent Metacognition and their Performance in Physics

Effect		**Value**	**F**	**Hypothesis df**	**Error df**	**Sig.**
Intercept	Pillai's Trace	.993	61588.588[b]	2.000	854.000	.000
	Wilks' Lambda	.007	61588.588[b]	2.000	854.000	.000
	Hotelling's Trace	144.236	61588.588[b]	2.000	854.000	.000
	Roy's Largest Root	144.236	61588.588[b]	2.000	854.000	.000
Gender	Pillai's Trace	.010	4.401[b]	2.000	854.000	.013
	Wilks' Lambda	.990	4.401[b]	2.000	854.000	.013
	Hotelling's Trace	.030	4.401[b]	2.000	854.000	.013
	Roy's Largest Root	.030	4.401[b]	2.000	854.000	.013

a. Design: Intercept + Gender

b. Exact statistic

c. Computed using alpha = .05

Result on Table 3 shows that, gender significantly influenced the Prediction between students' inherent metacognition and their performance in Physics. This is evident from the F-calculated value of 4.401 and p-value of 0.01 for gender which is less than 0.05 level of significance (0.01 < 0.05). Since the p-value is lower than 0.05 level of significance, the null hypothesis is rejected. This means that gender significantly influenced the Prediction between students' inherent metacognition and their performance in Physics.

The need to further examine where the influence from table 3 lie necessitated table 4. Result in Table 4 revealed that gender did not significantly influence students' inherent metacognition but significant Prediction on gender was observed with respect to physics achievement. This is evident from the F-calculated value of 0.003 and p-value of .957 for metacognition and 8.810 and p-value of 0.003 for performance

Table 4. Tests of Between-Subjects Effects (Differences)in physics respectively.

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	Awareness	0.263[a]	1	0.263	0.003	0.957
	Physics	1031.071[b]	1	1031.071	8.810	.003
Intercept	Awareness	8572992.095	1	8572992.095	93507.474	.000
	Physics	3511943.817	1	3511943.817	3008.886	.000
Gender	Awareness	0.263	1	0.263	0.003	.957
	Physics	1031.071	1	1031.071	8.810	.003

H_{O3}: *School type influence will not be significant in the prediction between students' Inherent metacognition and their performance in physics.*

In order to test hypothesis four, participants' responses to Metacognition Inventory and WASSCE result in Physics were collated and analysed based on School type as shown in Table 5. This shows that school type significantly influenced the Prediction between students' inherent metacognition and their performance in Physics. This is evident from the F-calculated value of 14.151 and p-value of 0.00 for school type which is less than 0.05 level of significance (0.00 < 0.05). Since the p-value is lower than 0.05 level of significance, the null hypothesis is rejected. This means that school type significantly influenced the prediction

between students' inherent metacognition and their performance in Physics.

Table 5. MANOVA of School Type Prediction on Students' Inherent Metacognition and their Performance in Physics

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.993	58043.520[b]	2.000	854.000	.000
	Wilks' Lambda	.007	58043.520[b]	2.000	854.000	.000
	Hotelling's Trace	135.933	58043.520[b]	2.000	854.000	.000
	Roy's Largest Root	135.933	58043.520[b]	2.000	854.000	.000
School Type	Pillai's Trace	.032	14.151[b]	2.000	854.000	.000
	Wilks' Lambda	.968	14.151[b]	2.000	854.000	.000
	Hotelling's Trace	.033	14.151[b]	2.000	854.000	.000
	Roy's Largest Root	.033	14.151[b]	2.000	854.000	.000

a. Design: Intercept + School Type

b. Exact statistic

c. Computed using alpha = .05

Table 6 shows that school type did not significantly influence the prediction between students' inherent metacognition but significant prediction of school type was observed with respect to physics performance. This is evident from the F-calculated value of 3.062 and p-value of .080 for inherent metacognition and 25.053 and p-value of 0.000 for Physics performance.

Table 6. Tests of Between-Subjects Effects (Differences)

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	Awareness	279.736[a]	1	279.736	3.062	.080
	Physics	2877.893[b]	1	2877.83	25.053	.000
Intercept	Awareness	8059722.891	1	8059722.891	88223.674	.000
	Physics	3357727.363	1	3357727.363	29230.646	.000
School Type	Awareness	279.736	1	279.736	3.062	.080
	Physics	2877.893	1	2877.893	25.053	.000

Discussion

This study found that students' inherent metacognition did not significantly predict their performance in Physics. A correlation in predictive terms suggest that, without accounting for other moderating variables, inherent metacognition is not a predictor of students' performance in physics. Evidently, all learners have inherent metacognitive process which allows for decision making when learning. However, Conscious effort as suggested in the works of Kang and Keinonen, (2018), Ohtani and Hisasaka (2018), Onu et al. (2012) and Ozturk (2017) is required to train the mind of learners on how to know and regulated their knowledge. The fact that students' knowledge of cognition and regulation of cognition, and its components, as tested in this study were measured through an inventory, this may not have catered for students' objectivity in terms of providing answers as expected unlike when they are formally trained on how to measure knowledge and regulate it. This instrument only allows for students to express themselves on the processes they consciously took during physics learning and not a test to measure the application of these components of metacognition in-process.

There are reasons to theorize an alternative outcome of this variable if tested through a qualitative observation of the respondents. Ozturk (2017), Callender, Franco-Watkins and Roberts (2016), Cornoldi, et al. (2015), Bannert, et al. (2015), Sawney and Bansal (2015), Narang and Saini (2013), have all posited predictive or relational correlation between learned metacognition and students' performance at instances of their various studies. On the contrary, the research of Ohtani and Hisasaka (2018) reported no significant relationship exists between metacognition and students' achievement without a didactic effort on learners. However, the past researches were not directly linked to physics performance and inventory was not employed in the data gathering.

Gender difference in terms of performance was observed as male students outperformed their female counterpart in physics achievement but not in inherent metacognitive components. This observation was however significant as obtained from the statistical value in physics performance. This may hold for the samples of respondents and sometimes otherwise. Also, literature in this area reported no significant difference in the performance of male and female students in learned metacognition. The study of Onu et al. (2012) found gender difference in learned metacognition of male and female students which may be attributed to the difference

in the instrument employed to elicit data (metacognition test). The position of RaniI and Govil (2013) reported an alternate position.

Further analysis of school type prediction in inherent metacognition and physics performance found that private schools out-performed their public schools' counterpart in both inherent metacognition and physics achievement, although, the overall analysis predicted no significance in the correlation between inherent metacognition and physics achievement. This moderator variables established otherwise in respective instances. This difference may be due to the learning environment (this vary from school to school as private schools have a more conducive environment in most cases), instructional resources (private schools had advantage) and students background (also in favour of students from private schools) which are characteristics that favoured private schools than public schools as observed in the sampled schools. The position of this research is that no significant difference exists in the performance of Public and Private schools with respect to inherent metacognition. The position of literature is however unclear in this respect as no previous study under review had considered this variable.

Conclusion and Recommendation

This study concludes that inherent metacognition did not predict students' performance in physics. On moderator variables, influence registered by score level, gender and school type were on physics performance as against the expected literary out. The direction of differences experienced were on physics performance. The recommendation is that, students should learn metacognition as a conscious process to improve their performance in physics and maybe by extension other subjects especially at the senior secondary school level.

A didactic approach to metacognition (learned) is recommended to trigger performance as theorised in studies under review. For desired outcome, teachers may need to pay adequate attention into conscious training of learners on metacognitive processes with attendant test and problem-solving to cater adequately for students' needs. While cognitive overload has been in the negative among learners, a possible infusion of metacognitive teaching may reduce burden on teachers as self-regulated learners according to the literature require teachers only as facilitators of their learning.

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Chapter 20 - Socio- and Applied Linguistic Peculiarities of Using L1 in Georgian Educational Discourse

Khatuna Buskivadze

Chapter Highlights

- The present study aims to investigate the socio- and applied linguistic functions and frequency of lecturers' language behaviors (code-switching (CS), code-mixing (CM), and translanguaging) in Georgian educational discourse, namely, in teaching General English (EFL) at the university level.
- An examination of Georgian discursive peculiarities is a novel addition to this field of research, as there are very few studies focusing on Georgian lecturers' language behaviors in EFL.
- Both quantitative and qualitative research methods were employed to analyse lecturers' recorded lessons (100 hours of EFL).
- Surprisingly, in contrast to previous studies' findings, we found that the Georgian and English languages are equally used for informal/formal purposes.
- Both languages are used to express solidarity in the classroom conversations.
- The given study is a unique example, in which both, English and Georgian are used as marked/unmarked ("We-code", "They-code") choice, while in the previous studies L1 was only considered as "we-code" and a foreign language (English) was only regarded as "they code".
- Within 100 hours of recordings (EFL), 164 cases of code-switching, 20 cases of code-mixing, and 1 case of translanguaging, planned use of L1, were detected, generally used in teaching grammar.

Introduction

There are three major theoretical and conceptual frameworks for studying language behaviors in educational discourse: structural, sociolinguistic, and applied linguistics. Not many previous research studies have used the mixed approach model, which is a combination of sociolinguistic and applied linguistic methods of studying lecturers' language behaviors - namely code-switching, code-mixing, and translaguaging.

Thus, we reached the following research questions:

1. Which language behavior dominates in Georgian EFL context?
2. What are the sociolinguistic functions of code-switching, code-mixing and translanguaging in the Georgian educational discourse?
3. What are the applied linguistic functions of code-switching, code-mixing and translanguaging in the Georgian educational discourse?

Classroom language behaviours can be examined from various viewpoints such as form, location, patterns, and functions of code-switching, code-mixing, and translanguaging themselves. In this article, we aim to classify the sociolinguistic and applied linguistic functions of the above-mentioned language behaviours.

Background

This section covers and discusses the following theoretical basis: first, the difference between code-switching, code-mixing and translanguaging; secondly, two theoretical frameworks used in studying language behaviors; and, thirdly, the functions of classroom language behaviours.

The existing scholarly literature examines the definitions of code, code-switching, code-mixing; however, a more systematic and theoretical analysis is needed to underscore the difference between translanguaging and code-switching. Code-switching is an umbrella term, which covers code-mixing and translanguaging.

Table 1. Difference among the Following Terms:

Code-switching	•Involves bilingual competence and switches between two different systems. •Situation when it happens arise naturally, perhaps inevitably. •The change of setting and context just as its functions. •"Between two or more languages simultaneously or interchangeably within one conversation" (Grosjean 1982: 145). •As a response to the difficulties met during teaching in a medium where students have imperfect control. •A speaker can replace words, chunks, or a whole sentence to keep the conversation flowing.
Code-mixing	•"The process whereby speakers indulge in code-switching between languages of such rapidity and density, even within sentences and phrases that are not possible to say at any given time which language they are speaking" (Udoro 2008: 15). •Based on intra-sentential, contextual, and situational conversation, code-mixing is expressively purposing languages that are combined to increase social status or to keep the speaker's prestige in the society (Muysken 2000: 1). •Code-mixing is the embedding of various linguistic units such as affixes (bound morphemes), words (unbound morphemes), phrases and clauses from a co-operative activity of the participants, to infer what is intended, the participants must reconcile what they hear with what they understand (Muysken 2000: 2).
Translanguaging	•The general communicative competence of multilinguals (Canagarajah 2011). •Planned and systematic use of two languages. •"The ability of multilingual speakers to shuttle between languages, treating the diverse languages that form their repertoire as an integrated system" (Canagarajah 2011: 401-403). •As a tool to promote deeper understanding of content while developing the weaker language.

The term code refers to the language or a variety of language. In the present study it refers to English and Georgian languages. Classroom "code-switching" is used to refer to "the alternating use of more than one linguistic code in the classroom by any of the classroom participants (e.g., teacher, students, teacher aide)" (Lin 2013: 1–2). Thus, in this sense, the

term code-switching here can cover both "code-mixing (intra-clausal/sentential alternation) and code- switching (alternation at the inter-clausal/sentential level)" (Lin 2008).

The term "translanguaging" was first introduced by Williams (1994) to refer to a bilingual pedagogical practice that switches languages in the input and output. García extended the concept and defined it as "multiple discursive practices in which bilinguals engage in order to make sense of their bilingual worlds" (García 2009: 45). The phenomenon of code-switching has been defined from two different perspectives: sociolinguistic and pedagogical; and as two separate kinds of talk: ordinary and classroom. From the sociolinguistic perspective, Blom and Gumperz (1972) study code-switching in terms of social relationships among speakers. They distinguish the roles of codeswitching in the shifts of role relationship and topics, markedness in identity, and the expression of solidarity or intimacy within the conversation. The above descriptions are related to bilingual settings, so how does this affect EFL classroom settings?

Conversational Analytic and Interactional Analytic Approaches

These two analytic approaches – conversational and interactional - are generally used to study sociolinguistic functions of teacher's code-switching behaviour. They are barely used in combination but mostly on their own. Table 2 illustrates the differences and similarities between them as the paper aims to employ a combination of CA and IS analytic approaches. The CA and IS approaches share the same research method and object, while vary in their origins, research aims, and focuses.

Table 2. A Comparative Analysis of Interactional Sociolinguistic (IS) and Conversational Analytic Approaches (CA).

Characteristics:	**Interactional Sociolinguistic Approach (IS) (Bailey 2015)**	**Conversational Analytic Approach (CA) (Auer 1988)**
Research Method:	Voice and video recordings of naturally occurred talks, transcripts	
	Turn-taking and cooccurrence in the conversation	
Research Object:	Interaction, conversation, communication	

Characteristics:	Interactional Sociolinguistic Approach (IS) (Bailey 2015)	Conversational Analytic Approach (CA) (Auer 1988)
Research Aim:	Interpretation of verbal and non-verbal interaction	Structure, occurrence, and sequence of interaction
Origins:	Dialectology/anthropology	Cultural differences and meanings are less interesting.
Focus:	Social and cultural diversity and meaning	Structure of the conversation (speakers systematically use specific structures), culturally stipulated meanings are regarded as subjective and inaccurate.

Functions of Classroom Code-switching

There are two approaches to EFL instruction, the Monolingual (English-Only Policy) and the Bilingual Approaches. The monolingual principle refers to the exclusive use of the second language (L2) as instructional language to enable learners to think in L2, with minimal interference from L1 (Howatt 1984). However, an unconscious, unplanned use of L1 takes place in the L2 classrooms. In terms of pedagogical functions, two broad categories can be distinguished: Canagarajah (1995), and Ferguson (2003). Canagarajah introduced two broad categories of classroom code switching:

Table 3. Micro Functions of Classroom CS introduced by Canagarajah (1995)

	Content Transmission	Classroom Management
Micro functions of classroom CS	• Review • Definition • Explanation • Negotiation cultural relevance • Parallel translation • Unofficial student collaboration	• Opening the class • Negotiation directions • Requisition help • Managing discipline • Teacher encouragement • Teacher compliments • Teacher's commands • Teacher admonitions • Mitigation • Pleading • Unofficial interactions

In Canagarajah's classification, Tamil is used for familiar, spontaneous, and informal conversations, while English is regarded as unfamiliar, formal language. In contrast to Canagarajah's classification, Ferguson, who explored the role of the code-switching across different classroom contexts (Hong-Kong Pennington 1995; Lin 1996; Jonson 1983, 1987; Brunei – Martin 1996, 1999; Sri Lanka – Canagarajah 1995; Malta – Camilleri 1996; Botswana – Arthur 1994, 1996; South Africa – Addendorf 1993; Kenya – Merritt et al. 1992), outlined three broad functional categories:

1. Code-switching for curriculum access.	To help pupils understand the subject matter of their lessons.
2. Code-switching for classroom discourse management.	To motivate, discipline and praise pupils, and to signal a change of footing
3. Code-switching for interpersonal relations	To humanize the affective climate of the classroom and to negotiate different identities.

Ferguson (2003) documented and evaluated the already-conducted studies in the post-colonial countries. Canagarajah's classification is based on classroom observations. The qualitative study, which was conducted in Sri-Lanka, does not imply structural, but sociolinguistic and discursive functional analysis of CS behaviour. The teachers' and students' code-switching behaviours are merged. While Ferguson's classification is focused on the macro functions (language policy and language attitude).

Method

The qualitative study intends to collect, process, analyze, and present data objectively about occurrence of code-switching, code-mixing and translanguaging in teaching English to Georgian state university (Ivane Javakhishvili Tbilisi State University and Ilia State University) students. The CA and IS approaches were used to study the lecturers' language behaviour examples.

The data was collected from 10 lecturers' (100 hours overall) and their students' (B1-B2 Level of English) interactions in the English language classroom. Recordings were done by the teachers to obtain data in the field. The procedure for collecting data was through

recordings, observation, and transcriptions. The steps to analyze data included creating categories of sociolinguistic and applied linguistic functions of lecturers' talk based on the various communicative situations between lecturers and students, and educators' monologues.

Results

Both quantitative and qualitative analysis were used to analyse the data from the classroom recordings. All the classroom recordings were transcribed and the moments of using Georgian (the L1) and English (the TL) by the lecturer were collected and classified by listening to the recordings. A starting point, where the instructor seemed to address the entire class, was chosen, and counted as 0:00. From then on, every switch from English to Georgian was noted. An utterance was determined by intonation contours. The measurement of code-switching, code-mixing and translanguaging was undertaken and emphasizes the lecturers' discourse including students' questions and answers.

Table 4. The Quantity of using Language Behaviors according to the Lesson Type

Lesson type:	**Language behaviour and their quantity:**
Grammar	Code-switching (117); Code-mixing (12); Translanguaging (-).
Vocabulary	Code-switching (26); Code-mixing (6); Translanguaging (1).
Listening skill	Code-switching (-); Code-mixing (6); Translanguaging (-).
Speaking skill	Code-switching (3); Code-mixing (-); Translanguaging (-).
Writing Skill	Code-switching (12); Code-mixing (-); Translanguaging (-).
Reading skill	Code-switching (6); Code-mixing (2); Translanguaging (-).
Functional Language	Code-switching (-); Code-mixing (-); Translanguaging (-).

The amount of lecturers' language behaviours are listed in the table according to the lesson type. It shows: (1) lecturers avoid switching from English into Georgian at the lesson of functional language; (2) code-switching was in majority at all lesson types except the listening skill; (3) translanguaging was detected only once, during a vocabulary lesson; (4) the highest number of CS behaviour is given during grammar lessons. According to the data shown in the table, grammar lessons are most likely characterised by the largest amount of teachers' code-switching behaviours from the TL into the L1. Speaking lessons are less loaded with the lecturers' language behaviours.

In terms of the functions of code-switching from English to Georgian, the results appear to support previous findings. This suggests that switching to L1 necessarily serves some basic functions, which may be beneficial in the foreign language learning environment (Macaro 2005). However, some new functions were also detected in the Georgian educational discourse, which will be illustrated below. There are three broad categories of applied linguistic functions of using CS, CM, and translanguaging in the Georgian educational discourse: lesson content, classroom management, and rapport.

Table 5. Functions of Lecturers' CS, CM, and Translanguaging Behaviours

Categories/language behaviours	**Lesson content**	**Classroom management**	**Rapport**
Code-switching	• to show cultural aspects • to define (e.g., term) to find Georgian equivalent • to ask, inquire (to push students think and answer to the lecturers' question by themselves) • to check students' understanding • lecturers' input (e.g., grammatical issue) • to emphasize the important aspects of the material (e.g., Grammar rules, context) • to give a hint • to explain the	• to direct students' attention to another topic • to grab students' attention • to increase students' engagement • to announce administrative issues • lecturers' hesitation (to think, relax) (lecturers address themselves) • to group students • to solve the problems connected with the internet,	• to show eagerness • to praise • to tell a joke • to show emotions (e.g., surprise, embarrassment) • to give feedback • to calm students, reduce their stress • to motivate students • to make a remark • to give some advice

Categories/language behaviours	Lesson content	Classroom management	Rapport
	difficult topics • to approve/disapprove and expand the already-said ideas; • parallel translation.	zoom, etc. • to inform students • to give instructions. • giving homework and classroom tasks;	• to salute.
Code-mixing	• to define (e.g., term) to find Georgian equivalent; • parallel translation; • to ask, inquire (to push students think and answer to the lecturers' question by themselves).	-	-
Translanguaging	• parallel translation.	-	-

Table 5 shows that the classroom management and rapport categories are not characterized by lecturers' code-mixing and translanguaging behaviours, while code-switching is functionally loaded in all three categories.

This next section will discuss examples of code-switching, code mixing and translanguaging. The examples are chosen in terms of showing the functions detected only in the Georgian educational discourse and are not found in Ferguson's and Canagarajah's classifications. Within the framework of the discourse analysis the above-discussed theoretical frames (CA and IS) were also incorporated:

- Turn-taking, language choice based on turn-taking (CA)
- Language Attitude: showing dominance, formality, and informality (CA)

- Change in register (IS)
- implicature (IS)
- Language choice determines speaker's identity ("we-code" and "they code") (Contextualisation Cues)
- Change in frames (Contextualisation Cues).

Key:
// - Pause 0.5 second and more
= - direct link between sentences
[ ] – speeches are coincided
, - hesitation
? - rising tone
. - falling tone
__ - Georgian sentences are highlighted
( ) - English Translation

Example 1/Lecturer 1 (Code-switching)

Topic: Family Life Vocabulary – (T's input) 02:20
Functions:

- **Rapport**/Lecturer's joke
- **Lesson Content**/to show cultural aspects; to define (e.g., term) to find Georgian equivalent;

T: The difference between these two words immediate and extended. Anybody got the idea?
S: Family you're living with and your whole family right, right? [your father...]
T: [Like, ყვავი ჩხიკვის მამიდას/yvavi chkhikvis mamidas] (the relative, with whom you no longer have contact with) =
=actually (smiles)
Ss: (smile)
T: no, no, no, no it's not like ყვავი ჩხიკვის მამიდას/yvavi chkhikvis mamidas, it's like your uncle and his family, your auntie and his family big family, you know. and your

immediate family is your father, mother sister brother.

Based on lecturer's emotions, intonation, and tone in the recorded lecture, the above-given example depicts the several functions of one phrase (ყვავი ჩხიკვის მამიდა/yvavi chkhikvis mamida). Firstly, it was used as a joke; Second usage was aimed to define the word – extended family and show the speaker's identity and negative attitude towards it. A co-occurrence also takes place in the conversation (e.g., S: .....[your father...] T: [Like, ყვავი ჩხიკვის მამიდას/yvavi chkhikvis mamidas]), which shows the unintended dominance of one speaker over another.

Example 2/Lecturer 2 (Code-switching)

Topic: Family – vocabulary, Future Forms – be going to, will, present continuous (52:01)

Functions:

- **Classroom management**/to direct students' attention to another topic; teacher directs students' attention to the scheme on the functions of the future forms (be going to, will, present continuous).

T: where does 'will' belong?

S: [1st one!]

T: [3rd one?]

S: 1st!

T: 1st one, people's programmes or arrangements, hm? Let me check it, let's leave 'will' like that, okay?=

=ცოტა ხანი დავტოვოთ will-ი ესე/tsotakhani davtovot will-i ese (let's leave/forget about 'will' for a while)=

=Let's think about "to be going to".

The task presented in the example aims to group functions of the future forms. Students incorrect answer about the function of "will" form makes the lecturer direct students' attention to other forms. Lecturer's code-switching behaviour in this in this example is a kind of aid for the students to come to the correct answer by themselves, at the same time, this example serves to ease the situation and relieve tension for students, Georgian here serves as a close, familiar, informal language.

Example 3/Lecturer 2 (Code-mixing)

Topic: Family – vocabulary, Future Forms – be going to, will, present continuous (delayed error correction (01:16:00).

Functions:

- **Lesson content** - to ask, inquire (to push students think and answer to the lecturers' question by themselves).

S: I would like?

T: or I would like, that would be one of the options, that's it, I would like =

=კიდევ?/kidev? (what else?)

S: [or I am going to go]

T: [exactly] I am going to go to the café,=

=კიდევ?/kidev? (what else?) = directly present continuous.

S: [I am going]

T: [exactly]

Example 3 serves as an in-depth, interrogative function that helps students activate their schemata and maintain a lecture pace. Georgian is used as an informal language, and has a motivational function for students, it also expresses the identity of the lecturer.

Example 4 /Lecturer 4 (Code-switching)

Topic: Grammar - Past Forms – past simple, past continuous, past perfect, past perfect continuous (01:24:00).

Functions:

- **Lesson Content** - to emphasize the important aspects of the material (e.g., Grammar rules, context).

S: (is reading) They walked in the forest for hours before they realize they were lost.

T: Now, we're here, we're here, so, these are past tenses but what happened during=

= ნახე! სადამდე ესეიგი იარეს, იარეს მთელი 4 საათი იარეს რაღაც კონკრეტულ მომენტამდე/nakhe! sadamde eseigi iares, iares mteli 4 saati iares haghac konkretul momentamde. (Look, until when, so they had been walking, they had been walking for the whole 4 hours until the specific moment.)

S: they have had [to walk]

T: [had been walking] because you have for four hours, yes. ხანგრძლივობასთან ყოველთვის პროცესია ბავშვებო, თანაც პროცესი რაღაც წარსულ ქმედებამდე/khangrdzlivobastan yoveltvis procesia bavshvebo, tanac procesi raghac warsul qmedebamde (Guys, there is always a process with duration, moreover the process until the past action)=

=they had been walking, past perfect continuous, guys.

In the above example, the first code-switching behaviour explains and defines the grammatical context, while the second switching emphasizes the grammatical rule that the students were supposed to follow. The lecturer's register in Georgian and English languages are homogeneous, Georgian and English are equally informally used.

Example 5/Lecturer 5 (Code-switching)

Topic: Grammar - Past Forms – past simple, past continuous, past perfect, past perfect continuous (26:09).

Functions:

- **Classroom Management**- to solve the problems connected with the internet, zoom, etc.; to inform students.

T: Alright, so there are 14 of us=

=თოთხმეტნი ვართ, ზუმი გაითიშება და შემოვიდეთ ხელახლა/14ni vart, zoomi gaitisheba da Semovidet khelakhla (there are 14 of us, Zoom will be over soon, please come back) = 99

=Okay?

S: okay.

The use of the Georgian language by the lecturer in the example 5 serves to eliminate the gaps in the lecture process. Due to a lack of time, they used Georgian to avoid uncertainty. The lecturer's code-switching behaviour serves to express identity. The change in frames (tracking students' attendance/organization of the zoom meeting).

Example 6/Lecturer 6 (Code-switching)

Topic: e-sport, free-diving, grammar: present simple, present continuous (21:58).

Functions:

- **Lesson content**- to approve/disapprove and expand the already-said ideas.

S1: Shelia is not understanding the exercise (reading the exercise (homework)

T: Okay, no, Why NO then?

S1: ისა/isa (so), Shelia does not understand the exercise.

T: Yes, but why?

S1: Ah because it's a general thing.

T: well, the idea behind it is that she doesn't understand it right now, so, it should be present continuous, but it is not present continuous and why is it present simple, can anybody help us?

S2: because understand doesn't, ანუ, არ გადადის მოკლედ/anu, ar gadadis mokled (isn't used in).

T: -ing ფორმაში/-ing formashi (in -ing form), yes, because it's a stative verb here and we do not use -ing form, however, as I have mentioned on our previous lessons a lot of things are changing and I have heard by native speakers that understand already has -ing form, mostly in American English, I've heard like I'm not understanding you or I'm not understanding this instead of I don't understand but I have told you before If it's an exam kind of situation stick to the conventional grammar whereas if it's like a colloquial, everyday speaking English situation then you can use the -ing form I guess. Okay, good, thank you.

The above example serves to expand and reinforce the opinion expressed by the student. It should be emphasized that the lecturer does not repeat what the student has said but continues his or her opinion. The choice of lecturer language is determined by the student's choice (CA).

Example 7/ Lecturer 7 (Code-switching)

Topic: grammar - past simple - weekend) (37:50-38:04)

Functions:

- **Rapport** - to show emotions (e.g., surprise, embarrassment);

T: Okay, now, read the text and answer the questions.//

S: //უკაცრავად, ტექსტი არ ჩანს და რომ გადავუღო ან რამე, რომ გამოაჩინოთ?/ukatsravad, teqsti ar chans da rom gadavugho an rame, rom gamochinot? (Excuse me, I cannot see the text, may I take a screenshot, or could you please scroll up?)

T: არ ჩანს/ar chans? (isn't it visible?)

S: ანუ მარტო/anu marto…= (so, only)

T: =ანუ, ჯერ დაიწყეთ და მერე ჩავწევ/anu, jer daitsyet da mere chvwev (so, please first start reading then I will scroll down). =

S: = ანუ, ტექსტის მიხედვით ხომ უნდა ვუპასუხოთ/anu, teqstis mikhedvit khom unda vupasukhot (aren't we going to answer the questions according to the text)?=

T:= ხოდა, აქედან იწყება/khoda, aqedan itsyeba, [Next time a friend or colleague….] (კითხულობს ტექსტის დასაწყისს გაოცეული) (yes, then it starts from here.)

S: [აა, კარგი, კი ბატონო/aa, kargi, ki batono.] (aham, okay, yes, for sure.)

Considering the video recordings, the given example describes lecturer's emotional state. The lecturer was upset because, despite giving instructions already, the student still was unable to find the beginning of the reading task. The teacher was forced to use L1 (Georgian). So, the register from informal to formal changed by the student supports to ease the situation (e.g., აა, კარგი, კი ბატონო/aa, kargi, ki batono (aham, okay, yes, for sure, absolutely!).

Example 8/Lecturer 8 (translanguaging)

Topic: grammar quantifiers, present perfect vs past simple - shopping) (previous vocabulary review) (0:29-02:23)

Functions:

- **Lesson Content**- parallel translation.

T: Okay now, now let's remind you about a previous lecture yeah so it was about present perfect and the vocabulary of housework, right? housework. Now, I will tell you check some words some housework, whereas in Georgia and you tell me in English, okay?

Tornike, how it's in English, ლოგინის ალაგება/loginis alageba (make the bed)?

S1: make a bed.

T: Make the bed, Saba, ჭურჭლის დარეცხვა/churchlis daretskhva (Do the washing up)?//

S2: Wash, ისა/isa (so to say), I forget.

S2: Do the washing up.

T: Do the washing up, yeah, do the washing up, okay Luka, ნაგვის გატანა/nagvis gatana (take out the rubbish)?

S3: Take the rubbish?

T: take out the rubbish, yes. Ani, სარეცხის რეცხვა/saretskhis retskhva (do washing)

S4: wash the clothes?

T: do washing, yeah?

S4: [do the washing up]

T: do the washing up is when you wash dishes, do the washing, Malvina, უთოობა/utooba (do ironing)?

S5: ironing

T: [do ironing, yeah?]

S5: [do ironing]

T: Okay, Sergi, დალაგება ოთახის/dalageba otakhis (tidy the room)

S6: clean the room.

T: Aaa, and? ha?//

S4: Tidy it?

T: tidy the room, Ani, ტანსაცმელების შელაგება/tansatsmelebis shelageba (Put away your clothes)?

S: Ahh.

T: Put away your clothes, put away. Khatia, take clothes from the floor?

S7: იატაკიდან აღება ტანსაცმელების/iatakidan agheba tansatsmelebis? (Pick up clothes)

T: pick up dirty clothes, pick up dirty clothes, so, clean the floor and so on.

The given example illustrates the translanguaging, that the lecturer planned based on previous lecture material. The use of Georgian language expresses the identity of the lecturer.

Example 9/Lecturer 10 (Code-switching)

Topic: Writing – a paragraph, OC Feedback (32:46)

Functions:

- **Classroom management** - to grab students' attention; to increase students' engagement.

T: Right Okay, and there is also received one answer in the chat from Maria helpful tips for beginners who just started exercising=

=ნახეთ, წეღან რაც ვთქვი, statement-ის ფორმა მივცეთ/nakhet, tseghan rats vtqvi, statement-is forma mivtset. (look, that's what I said before, give it a form of a statement)=

= there are lots of helpful tips or several helpful tips for beginners who just started exercising okay? So, try to Imagine that this is an opening sentence right, so you need it to be in the form of this statement, alright guys.

The purpose of switching codes in Example 9 is to mobilize students' attention, highlighting and reminding what has already been said by the lecturer. English language is used as informally as Georgian one. This example of the lecturer's language behaviour can have not only one but several functions, the context was taken into consideration in the interpretation process, without which the research becomes void. Watching the lecture recordings for several times, noting the examples down allowed us to interpret the examples accurately. Expression of power by the lecturer (ნახეთ, წეღან რაც ვთქვი, statement-ის ფორმა მივცეთ/nakhet, tseghan rats vtqvi, statement-is forma mivtset. (look, that's what I said before, give it a form of a statement) in addition, the register alternates in both languages.

Conclusion

In the Georgian educational context, in 100 hours of recordings (EFL), 164 cases of code-switching, 20 cases of code-mixing, and 1 case of translanguaging were detected. In terms of the frequency of using language behaviours by the lecturer, grammar and vocabulary lectures are more loaded with them than lectures on language skills (writing, reading, listening, speaking). Moreover, the functions of Lecturer's language behaviours were broken down into three categories: syllabus, classroom management, rapport.

The analysis conducted within the qualitative research showed that functional classification of lecturers' CS behaviours differs from the classifications revealed in earlier studies. Namely, the following functions: **classroom management** (to direct students' attention to another topic), **lesson content** (to ask, inquire; to approve/disapprove and expand the already-

said ideas), rapport (to show emotions (e.g., surprise, embarrassment) were not detected in Ferguson's and Canagarajah's classifications.

Surprisingly, the given study in the Georgian educational context is a unique example, in which both, English and Georgian are used as marked/unmarked ("We-code", "They-code") choice, while in the previous studies L1 was only considered as "we-code" and a foreign language (English) was only regarded as "they code". In terms of the sociolinguistic functions, the examples show that register change, formality, informality, intimacy, and solidarity are equally presented by using both languages (Georgian and English). While the studies conducted by Canagarajah and Ferguson the native/first language is informal, and marked, "we-code", and the foreign language (English) is formal, unmarked "they-code", in the Georgian educational context, English is marked or unmarked as Georgian language. English as Georgian is characterized by the change in register. In the future, ten lecturers, who recorded the video lessons, should be interviewed.

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Chapter 21 - Entrepreneurship Skills Development through Education: Comparing Students from Faculty of Economics and Management of Tunis (FEMT) to Students from Higher Institute of Medical Technologies of Tunis (HIMTT)

Chaker Hajer, Slama Thouraya, Elyetim Nejiba

Chapter Highlights

- This article focuses on the effect of teaching through entrepreneurship on different curricular students' skills development with comparing students from Faculty of Economics and Management of Tunis to students from the Higher Institute of Medical Technologies of Tunis.
- Authors use a two-sample independent t-test to make the comparison.
- The results showed that the experiential method makes it possible to develop the entrepreneurial skills of all students regardless of the curricular followed, whether economic/finance or scientific, except for financial literacy, where the students of the FEMT have better developed this competence, and for entrepreneurial attitude where the students of the HIMTT have better developed it compared to those of the FEMT.
- These results are expected since the students of the FEMT have had finance courses and therefore master financial aspect better than those of the HIMTT, and the latter masters the technical aspects better than the former which makes them more willing to go into business than the students of the FEMT and develops better their entrepreneurial attitude.
- This result is consistent with the works carried out in this field and suggests the importance of teaching through entrepreneurship for the development of students' entrepreneurial skills whatever their specialty.
- It also underlines the importance of training non-specialist students more on the financial aspect of the business. We also suggest to pair students with managerial background with students with scientific one when teaching entrepreneurship.

Introduction

To become entrepreneurial, universities must contribute to create more and better jobs for graduated students. For this purpose, some of the most important priorities of universities are creating entrepreneurial mindsets through education and learning, as well as promoting entrepreneurship through the encouragement of business creation by youth. The aim of universities today is not only to make students aware of the importance of being entrepreneurs but also to help them to become entrepreneurial (Lackéus, 2015) since entrepreneurship is considered as a life skill for the 21st century (Adisel et al., 2022; Asici, 2021; Bailey & O'Daniel, 2021; Hajer & Hatem, 2022; Hajer & Hatem, 2022; Neck & Corbett, 2018). The main mean used by them is entrepreneurship education. As a result, the educational system is more and more focusing on developing students' entrepreneurial skills and abilities. In fact, the goal of entrepreneurship education is to give students the knowledge, skills, and attitudes to act in an entrepreneurial way. To reach these goals, many methods for entrepreneurship teaching were developed going from the theoretical content to the practical methods aiming to learn students how to become entrepreneurial by practicing it. Many scholars consider the practice-oriented approaches as the best way to develop students' entrepreneurial skills (Mwasalwiba, 2010, Piperopoulos and Dimov, 2015) as they push them to learn entrepreneurship by living the real life of entrepreneurs (Vincett and Farlow, 2008). However, even if more and more articles discuss the importance of practical teaching methods in developing students' entrepreneurial skills (Acharya and Chandra, 2019; Chaker and Jarraya, 2021; Sirelkhatim and Gangi, 2015) fewer articles pay attention to the importance of the students' background in developing these skills. In fact, to generalize the impact of these practical methods in developing students' entrepreneurial skills, it is important to compare their effects on students who followed different curriculars. For this reason, we will compare in this paper the effect of teaching entrepreneurship with the practical method on the development of entrepreneurial skills of students of the Faculty of Economics and Management of Tunis (FEMT) and those of the Higher Institute of Medical Technologies of Tunis (HIMTT).

Entrepreneurship Education and Entrepreneurial Skills Development

Entrepreneurship education is focusing more and more in developing students' entrepreneurial skills. This is not surprising as learning itself is considered as an

entrepreneurial process. As entrepreneurship education aims to develop students' cognitive and non-cognitive skills, many methods of teaching were developed to enable them to develop a wide range of skills. The use of the appropriate method depends on the course objectives and the targeted skills to develop.

Entrepreneurship Education as a Process of Students' Skills Development

Hjorth and Johannisson (2009) consider education as the achievement accomplished through the learning process and specify that "learning in the case of entrepreneurship would be creating new knowledge about the making of the new, about creation. In the case of entrepreneurship education, it is not only about learning what to do, but also learning how to do new things, how to create. Still new knowledge is created and acquired" (Hjorth and Johannisson, 2009, p. 57). Thus, they emphasize the importance of skills development through entrepreneurship education. Moberg et al. (2014, p.14) also consider that entrepreneurship education is about developing students' entrepreneurial skills when they present it as "content, methods and activities supporting the creation of knowledge, competencies and experiences that make it possible for students to initiate and participate in entrepreneurial value creating processes".

The entrepreneurship education purpose of skills development is mainly influenced by the definition of entrepreneurship which is focusing more and more on the importance of the continuous learning process from success and failure that guarantees the development of the entrepreneur, his team, and the whole enterprise. In this context, we propose the definition of the *Entrepreneurship and Education Action Plan of Northern Ireland* that presents entrepreneurship as "the ability of an individual, possessing a range of essential skills and attributes, to make a unique, innovative and creative contribution in the world of work, whether in employment or self-employment" (DE, DEL and DETI, 2002, p. 5).

This definition emphasizes the importance of entrepreneurial skills development for both self-employed and employed people as well as the importance of skills in mastering entrepreneurial activities. Being aware of the key role played by entrepreneurial skills in entrepreneurship and the importance of education in developing them, many pedagogical approaches were developed that scholars classified in three main themes.

Three Pedagogical Approaches to teach Entrepreneurship

Based on the work of Jamieson (1984), scholars classified pedagogical approaches in three themes. They distinguished between educating, or teaching about entrepreneurship, educating, or teaching for entrepreneurship, and educating, or teaching in or through entrepreneurship (Mwasalwiba, 2010; Sirelkhatim and Gangi, 2015).

According to Jamieson (1984), teaching about entrepreneurship is mainly composed by teacher-centered programs and is about the theoretical aspects of setting up and running a business (Piperopoulos and Dimov, 2015). The aim here is to enable students to have a general understanding of entrepreneurship as a phenomenon (Mwasalwiba, 2010). In these programs, students are passive (Fayolle and Gailly, 2008), and they must pay attention during the course sessions to increase their awareness of entrepreneurship. This theme is considered by scholars as a good way to push students to consider self-employment (Klapper and Tegtmeier, 2010) and to choose entrepreneurship as a potential career (Fayolle and Gailly, 2013). It is obvious that the content of this theme is largely made up of theoretical content including entrepreneurial traits, personality characteristics, economic success, the manner people think entrepreneurially and entrepreneurial awareness (Chaker and Jarraya, 2021; Piperopoulos and Dimov, 2015), business plans (Honig, 2004), conventional management-related subjects such as marketing and financial management (Kuratko, 2005) and small business management courses (Solomon, 2007).

Being aware about the importance for students to master entrepreneurial activities and to develop its practical side through experimentation and observation (Mulder et al., 2007), two learning-by-doing themes were developed. We talk about teaching for and teaching in or through entrepreneurship (Sirelkhatim and Gangi, 2015).

The former aims to develop a potential entrepreneur by simulating the entrepreneurial process and providing the practical skills and knowledge required to set up and run a business (Mwasalwiba, 2010). The aim of this approach is to develop entrepreneurial competencies like creativity, innovation, opportunity recognition, networking, adapting to change, and expecting and embracing failure (Fayolle and Gailly, 2013; Piperopoulos and Dimov, 2015; Sirelkhatim and Gangi, 2015). In this case, teachers educate students about the mechanisms for running a business (Bennett, 2006), and provide them with techniques such as ideas

generation, team building, business planning via simulation which is considered as the most used tool (Honig, 2004). In this theme, students typically role-play as entrepreneurs (Sirelkhatim and Gangi, 2015).

For the latter, namely teaching in or through entrepreneurship, students are pushed by their teachers to become actual entrepreneurs (Vincett and Farlow, 2008). They carry out projects and deal with real businesspeople. This helps them to have real experiences and to develop entrepreneurial skills by facing real problems and taking real risks (Chang and Rieple, 2013). It is not here about pretending to be entrepreneur, it is rather about learning with and through real-life entrepreneurship (Sirelkhatim and Gangi, 2015) and experiencing market forces (Dabbagh and Menasc´e, 2006).

The most frequently used tools in this theme are pitching business ideas to investors and shareholders and teaching by real-life entrepreneurs (Sirelkhatim and Gangi, 2015). Sirelkhatim and Gangi (2015, p7) consider this theme as the "entrepreneurial learning suggestions for EE programmes' best practice". Scholars recommend the use of this approach when the aim is to develop students' entrepreneurial skills and the simulation software is not available (Chaker and Jarraya, 2021).

Description of the Experiment

In this study, we compare two samples of students from two different higher institutions belonging to the same university which are the Faculty of Economics and Management of Tunis and the Higher Institute of Medical Technologies of Tunis. Students are taking entrepreneurship courses that were taught in the same way. In fact, both was taught through teaching through entrepreneurship.

The study shows that teaching through entrepreneurship develop students' entrepreneurial skills of all students regardless of the curricular followed, whether economic/finance or scientific, except for financial literacy, where the students of the FEMT have better developed this competence than those of the HIMTT, and for entrepreneurial attitude where the students of the HIMTT have better developed it compared to those of the FEMT.

Respondents

The two questionnaires were administered on-line, at the end of the entrepreneurship module, related to the first semester of the academic year 2021–2022. The first sample was composed of 69 students of FEMT who validated this module and agreed to take part in this survey. Of the respondents, 78.3% were women and 21.7% were men. 33.3% have already worked in associative activities, while 66.7% have never participated in such activities. The age of most respondents (84%) is between 21 and 23 years old. The respondents came from two different backgrounds: undergraduate Finance students accounted for 71%, and Economy students accounted for 29%. The second sample, composed of HIMTT students, was also composed of 69 students who validated this module and agreed to take part in this survey. Of the respondents, 87% were women, 13% men, 53.6% have already worked in associative activities, while 46.4% have never participated in such activities. The age of most respondents is between 21 and 22 years old (43.5%), and between 24 and 27% (37.5%). The respondents came from two different backgrounds: undergraduate biomedical-engineering students accounted for 44.9%, and medical biotechnology students accounted for 55.1%.

Course Structure

The entrepreneurship course in FEMT and HIMSTT is taught by two different teachers. Both use teaching through entrepreneurship and aim to develop students' entrepreneurial competencies by using practice-oriented courses (Mwasalwiba, 2010; Williams, 2015). In both institutions, adopting teaching for entrepreneurship approach is difficult because they lack simulation software, and computer resources essential for teaching through simulation games. That is why they chose to use teaching for entrepreneurship.

The practice-oriented course is taught in a workshop format for one and a half hours per week for both groups. Students in both institutions worked in teams. They ran their own real-life business and took responsibility for their enterprises. By adopting the practical approach, teachers had common activities but there are some changes. In fact, both conducted an ideation activity with students to make them choose their project idea. Both made students compete for the various positions within the company, ranging from CEO to various management positions. These exercises aimed to encourage students to think about real problems to solve them and to reflect on the requirements for each position and to assess their

strengths. Thus, at the end of these activities, students developed new ideas, experienced professional responsibility within their companies, took risks and managed conflicts and overcame the challenges of keeping the team together. They developed their entrepreneurial mindset and creativity. An activity of Business Model Canvas (BMC) is held in both courses where students became aware of the importance of the market discovery and research.

In the FEMT where students are familiar with managerial, marketing, and financial aspects, other activities aiming at better conducting market research have been carried out. In fact, activities of conducting interviews with potential customers and professional actors to get relevant feedbacks and to better plan the offer were held. Tools such as "Persona", "interviews guideline", "empathy map" and "aggregated empathy maps" were used during the workshop sessions. The aim is to make the market segmentation and to clearly define each segment value proposition. At the end of these activities, students correct their BMC considering market feedback. They had to think about the financial aspect of the business and to think about their financial potential sources. A final activity a prototyping was held where students made a simple prototype of their offer and were invited to involve their social network to improve it since they don't master the technical aspect.

In the HIMTT, the focus is rather on the technical aspect of their projects because that is where their strength lies. In fact, after the activity of the BMC discovery and development, many sessions of prototyping were held. Students were asked to improve their first prototype to get a functional one by relying on their technical skills, asking for help from their teachers who are specialists in the field, and obtaining feedback from potential users.

Although the differences, in both institutions, activities were important to develop students' financial literacy, their resources marshaling ability, and their ability to manage ambiguity. They also developed their entrepreneurial attitude, their innovation as an employee, and their entrepreneurial intention as well as their entrepreneurial knowledge. In both institutions, implementing these activities as part of the workshops required the mobilization of a wide range of educational tools as well as the adoption of an entrepreneurial mindset by the teachers responsible for the module. And to create the expected effects in the development of their entrepreneurial skills, these aspects should thus be perceived as such by the students.

Research Method

In this section, we will present the entrepreneurial skills investigated and the instruments used to measure them. We will present then the results of our study.

Entrepreneurial Skills investigated

The key role played by entrepreneurial education in assessing entrepreneurial skills, knowledge, attitudes, and mindsets among students is more and more recognized which pushed to the initiation of the ASTEE Project to identify theses skills and to create a tool to measure them (Moberg et al., 2014). Moberg an al. (2014, p. 15) defined skills as "a combination of the knowledge, the knowhow and the experiences that have been acquired and that are necessary / useful in order to carry out an activity in a professional way". Concerning entrepreneurship, Kuratko and Hodgetts (2004) advanced that both cognitively oriented skills and skills of a more non-cognitive character must be developed among students. This set of skills enables entrepreneurs to go through different stages in entrepreneurial ventures and to meet different challenges (Shane and Venkataraman, 2000; Stevenson et al., 1985).

In our case, we adopted the skills identified by the ASTEE project which cover both cognitively oriented skills and skills of a more non-cognitive character and we looked for identifying whether students developed or not through entrepreneurship four inclusive skill sets that are needed in the different phases of an entrepreneurial venture going from exploration to evaluation, and exploitation, and which are relevant in self-employment and within established organizations (Moberg et al., 2014). It is about mindset, entrepreneurial knowledge, entrepreneurial skills and self-efficacy, connectedness to education, and connectedness to labor market.

We used the framework of skills offered by Morris et al. (2013) for the following reasons:

- The large set of entrepreneurial competencies offered by this framework that measures students' entrepreneurial mindset and intention, teaching methods and students' perception of teachers' entrepreneurial behavior.
- The measure tools were constructed to enable a comparison between two or more groups of students.

- The framework was used in the Tunisian context (Chaker and Jarraya, 2021) and in similar context (Messen and Saadaoui, 2020) and showed its relevance.

The definitions given by Moberg et al. (2014) are shown in the following table (see Table 1).

Table 1. Skills Definition (Moberg et al., 2014)

Skill set	Variable	Definition
Mindset	Entrepreneurial mindset	When students focus on action and responsibility
	Core self-evaluation	It is about individual's belief in his or her own capability to successfully perform challenging activities and tasks
	Entrepreneurial attitude	It is about individual's attitude toward his/her own capability to successfully perform various entrepreneurial activities
Entrepreneurial knowledge		Knowledge about how to identify opportunities, the context in which people live and work, how the economy functions and ethical positions of enterprises.
Entrepreneurial skills and self-efficacy	Creativity	The ability to think in new and imaginative ways
	Financial literacy	The ability to understand financial statements and budgets.
	Managing ambiguity	The ability to cope with uncertainty and ambiguity in the process of implementing and exploiting a business idea.
	Marshaling of resources	The ability to assemble and organize resources to exploit a business opportunity.
	Planning	The ability to plan and structure tasks.
connectedness to education	Teaching methods	The teaching methods used to teach entrepreneurship
	Entrepreneurial teachers	It Measures the extent to which students consider their teachers encouraging them to develop an entrepreneurial mindset.
connectedness to labor market	Innovative employee	It is about innovativeness in problem definition and problem solutions and capacity for taking responsibility.
	Entrepreneurial intention	It measures student's intention to start up a company soon.

Measures

Since we considered the ASTEE framework to measure the skills developed by students through entrepreneurship education, we used the scales created by Moberg et al. (2014) for the ASTEE project. These scales have the advantage of showing high reliability levels. All the scales are seven-point Likert scales, where "1" means "completely disagree," and "7" means "completely agree". The variables, the number of items and the Cronbach's alpha are presented in the following table (see Table 2).

Table 2. Variables' Scale Items and Reliability

Variable	Number of items	Cronbach's alpha
Entrepreneurial mindset	3 items	0.810
Core self-evaluation	5 items	0.912
Entrepreneurial attitude	3 items	0.874
Entrepreneurial knowledge	3 items	0.877
Creativity	4 items	0.939
Financial literacy	3 items	0.928
Managing ambiguity	4 items	0.828
Marshaling of resources	4 items	0.924
Planning	4 items	0.924
Teaching methods	6 items	0.934
Entrepreneurial teachers	3 items	0.918
Innovative employee	3 items	0.925
Entrepreneurial intention	3 items	0.863

Methods and Results

We performed a two-sample independent t-test on the groups which were divided according to the affiliation of the respondents. In this test, we investigated whether the mean values significantly differed between respondents in the groups. This test is commonly used to measure the statistical differences between the means of two groups. In our study, the data meet the requirements of its use which are the followings:

- The dependent variables are continuous.
- The independent variable is categorical.
- All cases have values on both the dependent and the independent variables.

- The two groups are independent which means that there is no relationship between the subjects in each sample. In our case, each sample studied in a different institution, so that (a) the subjects in the first group were not in the second group; (b) no subject in one group influenced subjects in the other group; (c) the groups did not influence each other.
- The sample of data were randomly chosen from the population.
- The moderate size of each sample makes the normal distribution of the dependent variable for each group unnecessary because, in moderate or large samples, a violation of normality may still yield accurate p-values; and
- According to the following table (see Table 3) the assumption of homogeneity of variances (variances approximately equal across groups) is not violated except for entrepreneurial teachers (p-value= 0.038 < 0.05).

Table 3. Test of Homogeneity of Variance

	Levene statistics	df1	df2	Sig.
Entrepreneurial mindset	0.001	1	136	0.980
Core self-evaluation	0.240	1	136	0.625
Entrepreneurial attitude	0.010	1	136	0.922
Teaching methods	0.483	1	136	0.488
Entrepreneurial teachers	4.384	1	136	0.038
Entrepreneurial knowledge	1.837	1	136	0.177
Creativity	0.078	1	136	0.781
Financial literacy	0.476	1	136	0.491
Managing ambiguity	0.439	1	136	0.509
Marshaling of resources	0.964	1	136	0.328
Planning	0.050	1	136	0.824
Innovative employee	0.245	1	136	0.622
Entrepreneurial intention	2.796	1	136	0.097

In the following table (see Table 4), we present the results of these tests:

Table 4. Survey Results

Skill set	Variable	Students of the FEMT mean (1st sample: n=69)	95% CI	Students of the HIMTT mean (2nd sample: n=69)	95% CI	Δ Mean	TΔmean Sig.
Mindset	Entrepreneurial mindset	4.8696	[4.50-5.23]	5.0628	[4.70-5.41]	-0.1932	NS
	Core self-evaluation	5.3420	[4.98-5.69]	5.4290	[5.07-5.78]	-0.0869	NS
	Entrepreneurial attitude	4.5942	[4.16-5.02]	5.2705	[4.81-5.72]	-0.6763	**-2.149***
Connectedness to education	Teaching methods	4.1932	[3.79-4.59]	4.0676	[3.63-4.50]	0.1256	NS
	Entrepreneurial teachers	4.9130	[4.49-5.32]	5.0097	[4.51-5.50]	-0.0966	NS
Entrepreneurial knowledge	Entrepreneurial knowledge	5.2126	[4.87-5.55]	5.2222	[4.82-5.62]	-0.0096	NS
Entrepreneurial skills – Entrepreneurial self-efficacy	Creativity	5.0761	[4.70-5.44]	5.1703	[4.80-5.53]	0.0942	NS
	Financial literacy	4.9130	[4.54-5.28]	3.9565	[3.56-4.35]	0.9565	**3.510*****
	Managing ambiguity	4.8007	[4.50-5.09]	5.0326	[4.70-5.35]	-0.2318	NS
	Marshaling of resources	4.9783	[4.63-5.31]	5.1268	[4.74-5.51]	-0.1485	NS
	Planning	4.9275	[4.56-5.28]	5.2754	[4.90-5.64]	-0.3478	NS
Connectedness to Labor market	Innovative employee	5.3623	[4.99-5.72]	5.6667	[5.29-6.03]	-0.3043	NS
	Entrepreneurial intention	4.9130	[4.53-5.29]	5.0290	[4.59-5.46]	-0.1159	NS

Note: NS = not significant (p-value > 0.05), *p-value < 0.05, ***p-value= 0.001

Table 4 shows that there are no significant differences in means between FEMT students' and HIMTT ones for eleven out of 13 variables. For these eleven variables, the values of means for the first sample belong to the 95% confidence interval of the variables' means for the

second sample. This result implies that the means in both samples do not differ significantly, which is not the case for the two remaining variables. In fact, for these variables, namely "entrepreneurial attitude" and "financial literacy", the values of means for the first sample do not belong to the 95% confidence interval of the variables' means for the second sample which implies that the means in both samples do differ significantly. For these two variables, the sign of the mean differences, which corresponds to the sign of the t value, is positive for "financial literacy" and negative for "entrepreneurial attitude". These results indicate that the means for the FEMT students are significantly greater for the former and the means for the HIMTT students are significantly greater for the latter. This leads us to conclude that the teaching through entrepreneurship method has approximatively the same effect on both groups. The results also show a significantly better effect on entrepreneurial attitude of the HIMTT students than FEMT students (5.2705 and 4.5942 respectively). The reverse is true for the "financial literacy (3.9565 and 4.9130 respectively).

Discussion

The objective of this research was to identify the effect of teaching through entrepreneurship on the development of students' entrepreneurial skills who followed different curricular (economic/finance VS medical biotechnology/ biomedical engineering). The finding sheds light on the variation on skills development due to the practical method among Tunisian students.

Many studies are conducted by researchers either in Tunisian context (Chaker and Jarraya, 2021) or in similar (Boubker et al., 2021; Messen and Saadaoui, 2020) or different contexts (Hocenski et al., 2019; Shi et al., 2020) to illuminate entrepreneurship education (Liguori et al., 2019) and to find the best practice in teaching methods that better enables students' entrepreneurial skills development (Balan and Metcalfe, 2012; Peltonen, 2015).

These prior studies showed that using practical methods or combining it with theoretical one help students to better develop their entrepreneurial skills. Given that entrepreneurship education is considered as a good way to enhance the readiness of young entrepreneurs while they are still studying at university and that this module is, in Tunisian context, generalized to all students regardless of their specialties, the purpose of this study is to identify whether the

teaching through method that is likely to better develop students' entrepreneurial competencies have the same effect on students who followed different curricular. As such, our study showed that this teaching method helped economic/finance students and medical biotechnology/biomedical engineering students develop their entrepreneurial skills which is in line with the widely endorsed view that entrepreneurship education based on experience and action-oriented programs develops better students' entrepreneurial skills (Cope and Watts, 2000; Chaker and Jarraya, 2021; Minniti and Bygrave, 2001; Rae and Carswell, 2000). In fact, the prevailing idea about entrepreneurship education is that entrepreneurs learn through learning-by-doing. This conducted teachers to develop activities helping them to try and to learn from their errors, to become familiar with problems and to try to solve them, to tolerate and deal with uncertainty, and to develop their unknown discover abilities (Pepin, 2012; Timmons et al., 2011). For this purpose, students had to increase their awareness about entrepreneurship which pushes them to consider self-employment (Klapper and Tegtmeier, 2010), and to choose entrepreneurship as a potential career (Fayolle and Gailly, 2013).

Even if our study joins the studies of Souitaris et al. (2007) and Chaker et Jarraya (2021) and indicates that living a real experience enhances the entrepreneurial intention of the students, our results also indicated that this effect exists whatever the specialty of the students. In fact, we found that there is no significant difference of means between FEMT students and HIMTT ones. It is also the case of self-efficacy among both groups where this skill is developed thanks to students' creativity, planning ability and ability to marshal resources development. The dynamic process of internal self-reflection and social engagement conducted by the learners during the workshop sessions explains the fact that both groups developed their innovation abilities as employees (Donnellon et al., 2014; Lackéus et al., 2016).

In the kind of learning in which both groups are engaged, they were well informed about what entrepreneurs do, what entrepreneurship is, and why entrepreneurs are needed (Hytti and Kuopusjärvi, 2004). Additionally, teaching methods based on practice are important for students' engagement (Balan and Metcalfe, 2012) described as the combination of the time and energy they devote to their learning and the effort made by institutions in using effective educational practices (Kuh et al., 2008). This explains why both samples present no significant difference values in core self-evaluation, entrepreneurial mindset, and entrepreneurial knowledge. Furthermore, students assumed that their educators were

entrepreneurial teachers as they encouraged them to be involved in an entrepreneurial mindset as well as they are involved in the active approach of teaching, which puts students at the center of the learning process.

It should be noted that even if there are no significant mean differences between the two samples for eleven developed entrepreneurial skills, the mean values of both groups are either inside or above the values of the 95% confidence interval of the tertiary-level students who have entrepreneurial education in the study made by Moberg et al. (2014), which means that all students developed well these different skills.

As for financial literacy, our study shows the existence of a significant difference between the two samples for this skill. The mean values show a better range of FEMT students compared to HIMTT ones. This can be explained by the fact that the FEMT sample is mainly composed of students of finance (71%) who were already taught modules that develop this skill, and that the teacher dedicated a session where she made them work to develop the financial side of their business.

According to the entrepreneurial attitude, the mean values show a better range of HIMTT students. Defined as the individual's attitude toward his/her own capability to successfully perform various entrepreneurial activities (Moberg et al., 2014), this result can be explained by the fact that these scientific students who succeeded to develop a functional prototype of their idea has more confidence on the chance of transforming their idea into a business. As we already explained, the course structure focused a lot for these students on the improvement of their prototype as they do not master the managerial aspect of the business. As for FEMT students', we can consider that the technical aspect is their main weakness.
An overall positive assessment of this study can be made, with indications of the importance of teaching entrepreneurship by practicing further activities in developing students' entrepreneurial skills regardless their specialties.

Even if the sample is not large enough to generalize our finding, but this experience supports the importance of the decision to generalize entrepreneurship education for students in all specialties to develop their entrepreneurial skills. According to our finding, we recommend teaching entrepreneurship with practice and developing more activities for non-specialty

students on the financial aspect of their project, judged by some students as the most complicated aspect. The objective is not to make them experts in the field, but to help them acquire a minimum of knowledge allowing them to have a clearer vision on the launch and management of a company. As for specialist students, in our case finance and economics students, we recommend allowing them to involve other students who have mastered the technical aspect in their teams. We also encourage institutions on university campuses to bring together students from different specialties to follow the entrepreneurship module together. This interaction will develop two-way knowledge exchange and the development of different skills.

Conclusion

The aim of this study was to assess the effect of teaching through entrepreneurship on the development of students' entrepreneurial skills by comparing two students' samples who followed different curricular. We measured the development of thirteen entrepreneurial skills considered as essential to enable entrepreneurs to go through different stages in entrepreneurial ventures and to meet different challenges (Shane and Venkataraman, 2000; Stevenson et al., 1985). Our study may help teachers to choose the best practices for developing their students' entrepreneurial skills and give support to the decision to generalize the teaching of entrepreneurship to all students.

The main contribution of this paper is to shed light on the effect of teaching through entrepreneurship on the development of students' entrepreneurial skills. It also provides evidence for the importance of the action-oriented approach in entrepreneurship education and highlights its advantages in developing students' entrepreneurial skills regardless their specialty. The paper this paper is in line with the studies that attempt to assess entrepreneurship education programs in Tunisia and emphasizes the potential benefits of an action-oriented approach. The results suggest generalizing the teaching through entrepreneurship programs, as they indicate a high impact on the development of students' entrepreneurial skills regardless their specialties regarding entrepreneurial mindset such as core self-evaluation and entrepreneurial mindset, entrepreneurial knowledge, entrepreneurial skills such as creativity, managing ambiguity, marshaling resources, and planning, and connectedness to education and to labor market.

Our findings suggest that teaching entrepreneurship with practice is a better way to develop students' entrepreneurial skills'. We recommend developing more activities for non-specialty students on the financial aspect of their project, and, as for specialist students, allowing them to involve other students who have mastered the technical aspect in their teams. We also encourage institutions on university campuses to bring together students from different specialties to follow the entrepreneurship module together. This interaction will develop two-way knowledge exchange and the development of different skills.

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Chapter 22 - Understanding the NIST Risk Management Framework in Higher Education Institutions

Matthew Paulson

Chapter Highlights

- With the recent proliferation of information technology, almost all users of technology, no matter the field, profession, or status, have experienced a commensurate increase in information security threats.
- Information Security Officers in public higher education institutions are not applying the Risk Management Framework defined by the National Institute of Standards and Technology (NIST).
- The purpose of this phenomenological study was to explore strategies used by information security managers at higher education institutions to conform to information security best practices.
- Data collected through interviews were coded using and analyzed using NVivo revealing that portions of best practices were in use at the subjects' institutions.
- To deter this phenomenon, recommendations to the higher education institutions include choosing a best practice framework that contains security controls best suited for the information to be protected and implementing the controls via high-level policies and procedures.
- Most institutions were using the NIST Cybersecurity Framework, which incorporates portions of the NIST RMF.
- The study of the application of the NIST RMF has not previously been applied to higher education institutions. This study represents an initial attempt in understanding if higher education institutions apply the NIST RMF.

Introduction

With the recent proliferation of information technology, almost all users of technology, no matter the field, profession, or status, have experienced a commensurate increase in information security threats (Gupta and Sharman, 2012). A recent example of an information security breach at a higher education institution is Florida Keys Community College, where adversaries accessed college resources through a compromised employee email account (Florida Keys Community College 2019). Another example is a ransomware event that occurred at the University of Utah, where the university paid attackers to regain access to encrypted data (University of Utah Communications, 2020). These attacks, along with other numerous attacks, underscore the need for stronger information security at these types of institutions. Adversaries will target any institution, regardless of size or geographic location.

Standing between end-users and the adversaries seeking to exploit them are information security officers and managers, who are responsible for identifying threats and vulnerabilities to information systems and their users. Implementing effective mitigation strategies reduces risk experienced by end-users to an acceptable level which will never completely protect all system information, but dramatically reduce the threats to acceptable levels depending on the organization and the information they protect (National Institute of Standards and Technology [NIST], 2018b).

According to Burkhead (2014), most adversaries target private organizations for exploitation and data exfiltration opportunities. However, educational institutions are becoming a more attractive target due to a large amount of personally identifiable information that the institution has stewardship over (Ahlan et al., 2015, Al-Janabi and Al-Shourbaji, 2016, Arafat et al., 2012, Burd, 2006, Butler, 2013, Custer, 2010, Dar, 2016, Grama, 2014, Hufe, 2014, Slusky and Partow-Navid, 2012). Academic institutions, including higher education facilities, are responsible for protecting information about students, faculty, and staff, which, if accessed, maybe used for identity impersonation purposes, financial crimes, and other nefarious actions (Mahabi, 2010).

Various technical and non-technical methods provide vulnerability mitigation. One such mitigation method is to adhere to industry-standard best practices (Center for Internet Security, 2018). Identifying and following the best practices are left to each organization to

research, customize to their specific situations and environments, and deploy (NIST, 2018b). Accepted international standards for security, notably the ISO 27000 series of standards, have been somewhat successfully applied to an academic situation (Itradat et al., 2014). The United States government also establishes best practices for federal information systems (NIST, 2013, 2018a). However, the United States government standards have not yet been adequately examined in the context of an academic institution.

The problem is that information security officers in public higher education institutions, as a whole, are not applying the risk management framework defined by the United States National Institute of Standards and Technology (NIST), and generally, do not have the strategies, education, and resources to do so. Alshare et al. (2018) remarked that higher education institutions are at a greater risk of compromise from adversaries who take advantage of vulnerabilities in a university's security infrastructure. The adoption of best practices allows an organization to enact mitigating strategies and provide for the confidentiality, integrity, and availability of data within their purview (Garrison and Ncube, 2011, NIST, 2018b).

Dedeke (2017) distinguished between risk-oriented and compliance-oriented information security. Compliance-oriented security involves understanding and following a set of rules that apply to an organization designed to increase and strengthen its information security posture. Examples of compliance-oriented security include observing the tenets of the Health Insurance Portability and Accountability Act of 1996 (HIPAA), the Payment Card Industry Digital Security Standard (PCI-DSS), the Family Educational Rights and Privacy Act of 1974 (FERPA), and other governmental and industry-specific regulations. Compliance-oriented security serves at least two purposes: an organization may be contractually obligated to comply with these types of regulations, or an organization may not be mature enough to implement a complete information security program and needs guidance on how to do so (Dedeke, 2017).

Conversely, risk-oriented information security takes into account a more holistic view of the organization. Risk-oriented security relies on regular risk assessments that consider security threats, organization and system vulnerabilities, and the likelihood of identified vulnerabilities being exercised. Appropriate mitigation strategies are then devised and implemented to reduce the impact of exercised vulnerabilities (NIST, 2012).

The significant number of information security breaches at higher education institutions demand more than compliance-based security (Dedeke, 2017, Garrison and Ncube, 2011). A more flexible approach is needed, especially for institutions that are somewhat mature in their security processes, procedures, and operations or that face significant risk due to their threats and vulnerabilities (NIST, 2018b, Prowse, 2017). Understanding and implementing a best practice provides the guidance necessary to transition from compliance-oriented security to risk-oriented security. When the transition is complete, the organization will be in a more solid position to identify information security risks and respond appropriately to those risks (NIST, 2018b).

Considering the pervasive threat of data loss, this study aimed to strengthen the general body of knowledge regarding security policies and practices in higher education institutions by specifically comparing practices against the NIST risk management framework. While information security industry best practices have been suggested in studies such as Dar (2016), Marks and Rezgui (2009), and Itradat et al. (2014), the suggestions for best practices are generic and do not tie back to the NIST risk management framework. By comparing current educational security practices to recommended practices by NIST, institutional security would be enhanced by creating a standard frame of reference for security managers in higher education settings.

Review of the Literature

Information security policies are of utmost importance to guide employees and other organization members in recognizing security threats and responding appropriately to them (NIST, 2006). The problem addressed in this study is that information security officers in public higher education institutions do not have strategies to apply the risk management framework as defined by NIST.

The purpose of this study is to identify strategies that university information security officers may use to implement the NIST risk management framework at higher education institutions. This review of higher education security policies will determine if those policies fall in line with industry best practices to prevent data breaches.

Information Security Policies Rationale

Before discussing the efficacy of security policies in a higher education setting, the reasons for security policies should be considered. Kissel (2013) defined security policies as a collection of administrative statements meant to define and constrain organizational activities that provide for the confidentiality, integrity, and availability of data. Security policies exist to provide a linkage between the organization's IT governance structure and the implementation of security controls (NIST, 2013). Security policies help organization members understand their role in protecting the information they are responsible for and pointing end-users to step-by-step procedures necessary to carry out that protection (Johnson, 2015).

Policies guide the implementation of security controls. Itradat et al. (2014) noted that security controls could be defined as technical or administrative actions taken by an organization to ensure data safety. Security controls are devised and implemented to address specific threats and vulnerabilities that an organization faces (Ahlan et al., 2015). To ensure the efficacy of these controls and ensure that the proper controls mitigate the correct vulnerabilities and threats, an organization should conduct a risk assessment.

A risk assessment typically involves a top-to-bottom review of the organization (NIST, 2012). A standard procedure involves assessing all of an organization's vulnerabilities and threats that could exploit identified vulnerabilities. As part of this procedure, an organization considers its physical and virtual assets. Physical assets may include the organization's building location, the servers, workstations, and other networking infrastructures that process the organization's data and the personnel associated with the organization (NIST, 2012). At the same time, virtual assets may include the actual information the organization is responsible for protecting, network configurations, user credentials, and any other data the organization deems of sufficient importance to protect.

Security policies exist to help guide employees in various appropriate actions to take in the event of a data breach or other security event (Johnson, 2015). Security policies are an essential preventative measure to help stop security events before they occur. When events do occur, individual employees must know precisely what to do to bring the organization back online (Cichonski et al., 2012).

Data Breaches in Higher Education

Higher education institutions have frequently been targets of opportunistic adversaries who wish to obtain information about students, faculty, and staff for the purposes of reselling or assuming the identities of victims (Misenheimer, 2014). The reasons for this targeting are varied, ranging from lack of proper protection to the fact that colleges and universities are responsible for a significant amount of PII. Butler (2013) noted that higher education institutions are more likely to suffer a data breach than other types of organizations, including businesses, federal and military, financial, medical, and state and local governments. Campbell (2017) stated that higher education institutions are popular targets for adversaries due to the amount of PII they maintain and colleges and universities' open nature.

According to Campbell (2017), thirty-five percent of all information security breaches occur at higher education institutions. Additionally, thirty-six percent of higher education security breaches occurred due to hacking or malware. Thirty percent of breaches were caused by inadvertent information disclosure, while seventeen percent were caused by exploiting mobile devices. As a juxtaposition, however, Grama (2014) noted that even though the vast majority of data breaches occurred in the educational sector, the average number of records exposed during each breach was lower than that of other sectors, such as finance. The number of educational records exposed during each breach from 2005-2014 was 27,509, while the average record exposure for financial institutions during the same time was 1,420,533 (Grama, 2014). Gupta and Sharman (2012) also reported the finding that breach occurrence was high, but the actual number of records compromised was relatively low. Alshare et al. (2018) remarked that higher education institutions are vulnerable, and information security policies should be applied or reviewed as soon as possible.

Because educational institutions are more at risk for data breaches than other organizations, Garrison and Ncube (2011) suggested finding a balance between the traditional openness of university settings and the necessity to protect data adequately is challenging. Information security personnel need to balance whatever tools they have at their disposal. Additionally, the institution’s culture should support information security in general, and faculty, staff, and students should be trained on how to protect institution information. Protecting the universities' information from adversaries should be a top priority of universities management and security managers, including a trickling down of information, education, and awareness

to student, faculty, and staff.

Arafat et al. (2012) noted that information security in a higher education environment has unique facets as compared to information security in other contexts; not only do security personnel need to provide for adequate security of the university's information, they need to do so in such a way not to disrupt the openness, accessibility, academic and intellectual freedom of the institution. When security personnel understand how to accomplish this, the likelihood of data breaches may be significantly reduced.

Kam and Katerattanakul (2014) stated that information security incidents could harm students, faculty, and staff at academic institutions due to the sensitive nature of the information that the institution keeps. Beaudin (2017) expressed that higher education institutions collect and store various types of information while being beholden to several different types of regulations, including the Family Educational Rights and Privacy Act (FERPA). If the institution collects and stores health data, they are subject to the Health Insurance Portability and Accountability Act (HIPAA); the institution may also be subject to additional state and federal regulations (NIST, 2008). According to Burd (2006), various educational institutions showed that compliance with external laws and regulations positively impacted information security. These regulations include FERPA, HIPAA, the Gramm-Leach-Bliley Act, and the Sarbanes-Oxley Act (SOX).

Without preventative measures, colleges and universities would continue to be rich targets for adversaries (Slusky and Partow-Navid, 2012). The question for university management and security managers is how to correctly identify threats and vulnerabilities and place appropriate mitigations around identified vulnerabilities.

Information Security Measures in Higher Education

Even though higher education facilities are targets for attack, many institutions have varying levels of protection in place to prevent or mitigate the effects of an attack (Custer, 2010). To appropriately protect against threats, an institution must deploy security measures commensurate with the level of security the organization’s information requires. If possible, the protections that the organization deploys should follow defense-in-depth methodologies (NIST, 2018b). Defense-in-depth follows a layered approach. The idea is that the

organization employs layers of security to either deter attackers or give the organization enough time to respond appropriately to the attack (Kissel, 2013). This section examines what protections are in place, including technical and non-technical defensive implementations.

Information security policies are one standard mitigation many colleges and universities have to defend against adversaries. Aloul (2012) noted that the weakest security link in any organization is information systems' users. Most security personnel consider user errors to be one of the greatest threats to information security. Information security policies should be put in place to protect users from themselves and protect the organization from their actions (Aloul, 2012).

Information Security Industry Best Practices

Al-Hamdani (2009) noted that a solid information security practice could either be based on industry best practices, governmental regulations, or both. Considering industry best practices, two frameworks are internationally accepted as excellent examples of security procedures. The first is ISO 27000. This standard was created and is currently maintained by the International Standards Organization (ISO). This standard intends to create an information security management system that maybe implemented by any organization of any size anywhere in the world (ISO/IEC, 2018). The ISO 27000 standard is subdivided into two parts: ISO 27001, which lays out instructions to create an information security management system, and ISO 27002, which lays out various controls that maybe used to implement and enhance information security management system (ISO/IEC, 2018).

The ISO 27000 standard has been used successfully in a higher education context. In one example outside of the United States, Itradat et al. (2014) implemented the ISO 27000 standard at a university in Jordan, creating an appropriate set of policies to adequately secure their physical assets and data that the university was responsible for protecting. Only the ISO 27001 portion, which involves the creation of policies, was implemented. The ISO 27002 portion, or the implementation of policies, was left to a later date. However, the study showed that the general application of the information security management system could be applied in an educational context.

Governmental best practices contained in the following two foundational document sources make up another broad category of security best practices: the Framework for Improving Critical Infrastructure Cybersecurity (NIST, 2018a) and the NIST Risk Management Framework (NIST, 2018b), both maintained by NIST. Both documents are designed to help organizations identify and mitigate technical and non-technical security risks.

The risk management framework consists of six steps: categorizing the information system, selecting appropriate security controls, implementing the selected controls, testing the selected controls, authorizing the information system for use, and continuously monitoring the information security posture of the new system (NIST, 2018b). This cycle involves completing a thorough inventory of the information system assets, threats, vulnerabilities, and mitigations. According to Dedeke (2017), a risk-based approach to information security considers threats and vulnerabilities to an organization as ongoing rather than one-time events. Risk is the likelihood that a threat source will take advantage of a vulnerability and cause harm to the organization. With a complete risk assessment, the organization will know several items about their network. They will know what data are stored and processed on the information system. They will know their hardware and software assets and will understand where to place effective defenses against technical and non-technical threats. Rodewald (2005) noted that organization management looks at investments in a cost-benefit fashion. As a result, they may not always see investments in security as returning any tangible benefit. If no immediate benefits may be seen from investing in security, managers may be reluctant to spend money and resources. However, if management understands that they are investing in prevention against future threats and mitigating current threats, they may be more inclined to invest in appropriate countermeasures.

The NIST risk management framework has been implemented successfully in non-educational, private contexts. Notable successful implementations of the NIST risk management framework have occurred in cloud service providers, none of whom are directly controlled by the government (Iorga and Karmel, 2015). These implementations have focused on reducing risk through a thorough risk assessment, selection and implementation of appropriate security controls, assessment of those controls, and continuous monitoring efforts. Researchers found that overall information security risk was reduced to an acceptable level after implementing the risk management framework (Iorga and Karmel, 2015).

However, some private organizations face challenges in adopting the NIST risk management framework. Amaghionyeodiwe (2017) attested that some organizations might face difficulty understanding and implementing the risk management framework due to its perceived lack of flexibility and lack of familiarity with the process. Amaghionyeodiwe (2017) also posited that implementing the NIST risk management framework requires a significant amount of corporate information governance and a robust corporate culture that is flexible enough and trusting enough to allow for significant change. Additionally, the risk management framework embeds risk assessments into its various steps; the organization needs to be flexible enough to respond to those assessments' findings. Academic institutions are at risk of adverse actions (Butler, 2013, Campbell, 2017, Cate, 2006, Feehan, 2013). Information security policies may be an effective countermeasure to combat adversarial elements (Ahlan et al., 2015, Al-Janabi and Al-Shourbaji, 2016, Alshare et al., 2018, Beaudin, 2017, Chan and Mubarak, 2012, Dar, 2016, Slusky and Partow-Navid, 2012). Security policies may also be tied to industry best practices (Burd, 2006, de Albuquerque and dos Santos, 2015, Hufe, 2014, Misenheimer, 2014). Several best practices are promulgated by governmental and non-governmental entities (ISO/IEC, 2018, NIST, 2018b). Although academic institutions follow many best practices, most do not necessarily follow NIST recommendations (Marks and Rezgui, 2009).

Method

The aim of this study is to understand the threat landscape that higher education institutions face more thoroughly. With this understanding, this study may help security managers identify strategies they may use to implement the NIST risk management framework. The problem addressed in this study is that information security officers in public higher education institutions do not have strategies to apply the risk management framework as defined by NIST.

Research Method and Design

The research method selected for this study was qualitative. The design is a phenomenological study with data collected via interviews. This is an appropriate design because all information security managers have experience adjusting to a changing threat landscape. van Manen (2017) postulated that a generic phenomenon could consider the

questions “What is the lived experience like?” and “How is the meaning of the experience understood?” Through searching interviews, these questions may be answered and reasonable conclusions maybe drawn from the collected data.

The phenomenology design was selected over others due to the unique nature of hands-on involvement information security officers experience on a day-to-day basis. Moustakas (1994) noted that the phenomenological study's specific essence is accepting the world that the subject lives in and recording experiences that the subject has relating to the research question. Vagle (2018) indicated that phenomenological studies are flexible by nature, allowing both the researcher and the subject to explore topics related to the research question and explore occasional tangential subjects.

If information security best practices were being studied, a quantitative survey or checklist is an option to capture current processes. However, due to the fluid nature of information security (NIST, 2006), the qualitative phenomenological approach allows the researcher to capture through open-ended questions a deeper understanding of participant perceptions of the phenomenon being studied. Many information security responses cannot be standardized across the board due to differing corporate conditions and threat landscapes (Prowse, 2017). Due to the changing nature of threat responses, a study of information security managers' lived experiences is appropriate to see how each institution responds to its specific security environment.

Population and Sample

The population for this research is information security managers at public higher learning institutions. Private institutions are not being considered for this study due to different organizational structures and requirements. Public schools are controlled by a board of education or an equivalent that ultimately reports to the state legislature; private institutions have no such reporting chain. This population shares the following characteristics: they all are in charge of the overall information security operation at their respective institutions, they all have appropriate industry certifications, and they have appropriate years of experience (five years or more) conducting or supervising security operations.

A search of LinkedIn groups revealed an invitation-only group titled *Security Issues for Institutions of Higher Education* (LinkedIn, 2020), which has between 400-500 members. The group has several aims and purposes, including personnel safety, information security at higher education institutions, physical security for campuses, and other security issues. The members of this group will serve as the population for this study. The researcher has petitioned this closed group administrator for permission to post a message to the group asking for volunteers for the study. The researcher has written permission from the group administrator to conduct the research using LinkedIn group members.

Creswell and Plano Clark (2017) suggested that at least four individuals be selected for the sample. Criterion sampling is the best sampling process to use in conjunction with this research. Criterion sampling is defined as selecting a population that meets predefined criteria (Creswell and Poth, 2016). Qualifying criteria used here include authority regarding information security decision-making. The respondents of the LinkedIn group query were first given a short survey to identify those people who meet the criteria; the subjects who meet the criteria were then contacted for an interview by the researcher. The interview participants underwent a first round of criterion sampling by the researcher to ensure that they meet the minimum qualifications to be an information security manager or administrator.

Data Collection Instrumentation and Procedures

Given this research's qualitative and phenomenological nature, the appropriate data collection instrument to use is an interview. Creswell and Poth (2016) indicated that in-depth interviews are among the best methods to fully understand the phenomenon that the participants are involved in. From a selected list of NIST recommended best practices, the subject was asked to identify the practices implemented in their institution or system. These best practices include the use of policies to govern the information security actions taken at the institution, the use of technical and non-technical capabilities to protect against internal and external adversaries, the existence and efficacy of end-user information awareness campaigns, the inclusion of senior management in information security decisions and planning, and other best practices as identified by NIST and the Center for Internet Security. In the interest of mitigating participant bias, the best practices' originating source was not identified to the survey respondent.

Interviews took place using Zoom. Each interview took 45 to 60 minutes. Video of the interviewee and the interviewer allowed each party to see each other to take advantage of visual cues during questioning. Permission for recording the interview was agreed to as part of the informed consent statement that the subjects accept.

The subject's identifying data was removed from the interview transcription. All subjects are assigned an identifier that does not contain any personally identifiable information. The subjects are referred to using the anonymous identifier.

Assumptions and Limitations

To preserve the integrity of the research, several assumptions about the participants and the interview process were considered and scrutinized. Only identified and invited information security managers were chosen to participate in the study. The information security managers were qualified, meaning they had sufficient experience, industry certifications, or both, as specialized knowledge was required to fully understand the interview questions so they could respond appropriately.Roberts (2010) noted that limitations might negatively impact the researcher's ability to generalize based on the data collected. One such limitation in this study was the relatively small sample size of participants. However, Creswell and Plano Clark (2017) indicated that a sample size of four to twenty-five is sufficient to attain an understanding of the research question at hand. An additional limitation was the willingness of identified information security managers that are members of the LinkedIn group to participate in the study.

Results

Significant findings were made that may add to the security discussion for higher education institutions. The study's purpose, which was to identify strategies that university information security officers may use to implement the NIST risk management framework at higher education institutions, was fulfilled in several surprising ways. The problem that was investigated was that information security managers at colleges and universities may not have the strategies and techniques needed to apply the NIST RMF. This problem was explored by showing that several study participants used the RMF and included another NIST

cybersecurity framework that better suited their needs. In this section, the makeup of the study sample is explained and the study results are discussed.

Description of the Study Sample

The intended target population of this qualitative study was the LinkedIn group titled *Security Issues for Institutions of Higher Education***.** The population size of this group was approximately 500 members. Targeted invitations were sent out via LinkedIn Messaging to 50 members of this group with the title of information security officer or the institutional equivalent. From this group, two individuals responded to the solicitation.

Due to the lack of response, the population was expanded. This expanded population consisted of information security officers at universities and colleges in Idaho, Oregon, Utah, Washington, and Wyoming. Invitations were sent to twenty individuals who had the title of information security officers or their institutional equivalent. In the case of four institutions, information security officer contact information was not available on their public website; thus, these invitations were sent to a generic security information email address. Two individuals from this additional population responded to the invitation to participate in this study. Table 1 lists demographic information about the sample.

Table 1. Sample Demographic Information

ID Number	Gender of Respondent	Approximate Student Size of Institution	US Geographic Location
1	Male	12,000	West
2	Male	43,000	Midwest
3	Male	28,000	West
4	Male	27,000	West

The eventual sample yielded many interesting results regarding the security policies in place at their individual institutions. A discussion of their responses to interview questions follows.

Several questions were asked of the study population. Most of the questions related to specific control families from the NIST RMF. The selected control families were deemed important enough by the researcher to be included in the interview questions. The interview

questions provided valuable insight as to how higher education institutions are handling various aspects of technical and non-technical information security.

Question: What is your current position?

Participants answered this question with a variety of answers. Personnel titles included "senior security analyst," "chief information security officer," and "information security officer." The purpose of this question was to build rapport between the interview and the participant and establish that the participant had sufficient knowledge and authority over the institutional information security policies to speak to them. Duties include updating anti-malware software definitions, running system vulnerability scans, preparing and disseminating scan reports, prioritizing the mitigation of discovered vulnerabilities, and advising management on vulnerability mitigation actions that should be taken.

Question: Do you have policies and procedures regarding access control? If so, can you describe them?

All participants indicated they did have policies related to access control, while no subjects indicated they did not. The subjects answering yes then went on to describe their access control policies and procedures.

A general theme of this question revolved around identifying types of users and establishing their access permissions accordingly. For example, all respondents indicated that they categorized users as either administrative users or non-administrative users. All respondents felt that this was an important distinction to make between types of users. One institution emphasized that they have strict access controls for student workers. Another subject responded to this question by stating their policy "..basically talks about what accounts are there. It basically governs our accounts and how you get an account at [the institution] about how it's control of what happens in the event that you compromised your account, et cetera."
One policy and procedure mentioned was that of multifactor authentication. Multifactor authentication is defined as using two or more authentication factors to gain access to a computing resource; authentication factors include something a person knows, something a person has, and something a person is, referring to biometrics (Kissel, 2013). In the respondents' case, multifactor authentication included a username and password combination

along with a smartphone app that provides a security token or one-time-use identification number.

Password policies were also mentioned as a way to ensure proper access control, along with assigning accounts specific responsibilities. One respondent noted that accounts were classified as administrative and non-administrative accounts. Password policies on administrative accounts were more stringent than those of non-administrative accounts.

Question: Do you have policies and procedures regarding configuration management? If so, can you describe them?

The answers to the first part of the question were either yes or no. Three participants indicated they did have policies related to configuration management, while one subject indicated they did not. The subjects answering yes then went on to describe their configuration management policies and procedures.

An overriding theme of this question was determining what secure configurations of devices meant and who was responsible for implementing and maintaining these configurations. Most respondents indicated that configurations depended on the sensitivity of the data that was contained on the system. Less sensitive data had less secure configurations, while systems that held and processed more secure data had more secure configurations. One security manager said "…we try to guide people to do the right thing is really what are our goal is so in our policy development".

One policy and procedure related to configuration management was the secure configuration of devices before and after deployment. Responses to this question included being able to configure workstations and servers per industry-standard configuration guides. Another response indicated that the institution wanted to control the applications presented to students, faculty, and staff. One subject said "…that's kind of our standards that we have and that includes desktops. And so we can also pushed out applications via desktops. We have a base build that the team that does SCCA builds the Windows default profile that we push out. Can we get all of our hardware without an image on it? OK, so we push the image to it and then we walk it out. Although let me strike that new boxes are coming from our vendor this semester are supposed to start coming with our build put on."

Question: Do you have policies and procedures regarding contingency planning? If so, can you describe them?

All participants indicated they had policies related to contingency planning. The subjects went on to describe their contingency planning policies and procedures.

Contingency procedures at the institutions revolved around data backups. Respondents indicated that backups happen on-site. Backups were also sent to a cloud service provider. From a policy standpoint, some respondents indicated that a data governance council guides the information technology department to what data needs to be backed up and where the ultimate backup location is. Regarding cloud backups, one security manager said "…our policies are based on that we back everything up into the major cloud and with our configurations and our documentation." The data governance council consists of some senior leaders of the institution. These are data owners who direct and act as a steering committee for the information technology department regarding data backup and other contingency planning.

One subject explained how their contingency plan was devised at the senior levels of the institution and sent down to lower levels of the organization. For example, the registrar's office would have a person advising senior leadership on what needed to happen to keep that office running, while the bursar's office would also have a person advising senior leadership on the plan. After the plan was completed, it was distributed to all levels of the organization.
Another security manager indicated that their contingency plan was outdated and needed to be revisited. The subject understood that regular review of the plan was a good security practice and was in line with both the NIST RMF and NIST CSF (NIST, 2013, NIST, 2018a). The institution in question was in the process of revising the contingency plan when this interview was conducted.
Question: Do you have policies and procedures regarding risk assessments? If so, can you describe them?

The answers to the first part of the question were either yes or no. Two participants indicated they did have policies related to risk assessments, while two subjects indicated they did not. The subjects answering yes then went on to describe their risk assessment policies and procedures.

A theme mentioned here was regular risk assessments. Each institution had its own definition of what "regular" meant. For some institutions, regular meant every two years. For others, however, regular meant continually. The idea of conducting regular risk assessments allowed the institutions to understand their own risk and security posture and respond appropriately to it.

Even if formal policies and procedures were not publicized at the institution, risk assessments were a regular operational feature. One security manager said "…we do have it's a very comprehensive cybersecurity risk management policy and as part of that policy, we have an implementation plan that describes how we're systematically going through. And and for the past three years, we've really been assessing the highest risk data."

One respondent reported that their institution undergoes a formal risk assessment every two years by an external assessment team. During one aspect of a risk assessment, the external team conducted vulnerability scans of the institution's network and attempted to penetrate its defenses. Another aspect of a risk assessment is presenting the vulnerability scan to decision-makers and recommended remediations for the discovered vulnerabilities. In this institution, the decision-makers that the findings are presented to were called a risk council.

The risk council consisted of the institution's chief information officer and leaders at a director level. They directed the information technology department to identify risks to the institution, measured their impact, and mandated remediations. Regarding the baselines used to conduct a risk assessment, one manager said, "…we have a risk management framework that is tailored from the…risk management framework". The manager here refers to the NIST RMF.

Another manager reported that its level of acceptable risk was defined by policies agreed upon by their equivalent of the risk council mentioned previously. The risk council identified all of the risks that the institution faced, from natural disasters to malicious software installed on system devices to power outages. The council comes to a consensus about which risks to commit resources to mitigate and which risks to accept as a part of doing business. As part of the risk council's decision-making process, the information technology department provided estimates on the resources needed to mitigate identified risks. The information technology department also implemented the risk mitigation actions directed by the council.

Discussion

The study results indicated that institutions follow some industry best practices in their information security policies and procedures. While many institutions indicated that they did not have policies and procedures for some of the study areas, all institutions reported having appropriate policies and procedures to meet their needs. For the most part, these policies and procedures followed the recommendations as laid out by the NIST risk management framework.

All of the respondents recognized the importance of being aware of and adhering to information security industry best practices. Besides ensuring the confidentiality, integrity, and availability of data, adherence to best practices was often a contractual or regulatory obligation. All respondents either had or were working on creating and promulgating policies and procedures that were the study's focus.

Those institutions that did not have a robust policy and procedure set did not feel any less prepared to face their information security threats. The institutions indicated that while they might not have had a robust policy set, the practices that were currently in place reflected current security industry best practices.

The study results also showed that while different institutions may have different policies and procedures, the intent was to comply with industry best practices whenever possible. The majority of the participants indicated that they either follow the NIST risk management framework or the NIST cybersecurity framework.

The NIST cybersecurity framework (CSF) provides a standard way of describing organizational security. This allows organizations to describe their current information security posture, describe their information security targets, identify opportunities for improvement within a consistent and repeatable process, assess progress toward the defined security target state, and communicate security information to internal and external stakeholders (NIST, 2018a). According to Shackelford and Bohm (2016), the NIST CSF is divided into five main areas: identify, protect, detect, respond, and recover. Each of these main areas has a set of discrete steps that organizations may use to guide their implementation. These broad categories subsume the individual control families of the NIST

RMF.

There are similarities between the processes of the RMF and the CSF. The steps to properly implement the RMF include categorizing the system, selecting appropriate security controls, implementing and assessing the selected security controls, authorizing the system for use, and continuous monitoring of the controls (NIST, 2018b). The steps for implementing the NIST CSF are as follows: prioritize and scope, orient and determine threats and vulnerabilities, create a current system profile, conduct a risk assessment, create a target profile, perform a gap analysis of the current profile and the target profile, and implement an action plan to close the gaps (NIST, 2018a). The overlap between these processes occurs during the RMF System Categorization step and the CSF Prioritizes and Scope step.

There are certainly differences as well. The RMF mandates the use of NIST SP 800-53 security controls (NIST, 2018b), while the CSF allows more flexibility by allowing a security administrator to use either CIS Top 20 Critical Security Controls, COBIT controls, ISO 27000 series controls, or NIST SP 800-53 controls (NIST, 2018a). Regarding flexibility, the CSF may be a more appropriate choice for non-governmental organizations to use because it does not mandate a specific set of controls to use to achieve adequate information security.
Another finding discussed by all study respondents was that when policies existed, they were reviewed regularly to ensure that they matched the reality of the institution's computing environment. The institutions did not disclose the review cycle for their policy set, other than to mention that the review happened regularly. The frequency of review was not necessarily important; the fact that the policy set was regularly reviewed was more critical than the frequency (NIST, 2013). When policies were reviewed regularly, the organization would be better positioned to respond to changing threats and be better able to manage vulnerabilities effectively (Prowse, 2017).

When the results are taken as a whole, it appears that all of the institutions have security procedures in place that work for them. The procedures in use may not be codified into formal policies, but the security managers interviewed felt that their security was adequate. Having said that, the managers were also looking for ways to improve their security posture. Recognizing what industry best practices apply to the institution and applying them can significantly reduce the attack surface of the organization (NIST, 2018b).

The overriding theme of the findings is preparedness. Each institution's information security manager felt that they were doing all they could against threats. All respondents were following one or more best practices, and implementing the best practices in a manner that made sense for the institution.

Conclusion

This study's problem focuses on enabling information security managers in higher education institutions with the tools and knowledge needed to implement an information security best practice framework. The purpose of this research study was to determine strategies that information security managers could use to implement a security best practice framework. The specific framework being considered in this study was the NIST RMF. However, as discussed previously, many of the study participants were using the NIST CSF. This section further discusses those findings, presents limitations to the study findings, and proposes additional research that may be conducted to extend the findings. The findings indicated that all institutions had a form of best practice in place. The best practices, which mainly conformed with the NIST CSF, were contained in procedures at each institution. Not all procedures were codified as formal policies. However, all institutions felt that the practices and procedures in place provided for an adequate level of information security.

Limitations of Study Findings

This study experienced several limitations, including recruitment and sampling challenges as well as a limited geographic area and small sample size. Regarding recruitment and sampling challenges, the researcher did not obtain enough participants from the LinkedIn population as defined in Chapter 3. As a result, the investigator expanded the potential population of information security officers to a defined geographic area as approved by the Institutional Review Board.

The geographic approved area included Utah, Wyoming, Colorado, Montana, New Mexico, Idaho, Oregon, and Washington. This geographic area increase resulted in an addition of 31 members into the population. With this population increase, only two information security officers responded to an invitation to participate in the study.

The relatively small sample size of four respondents leads to issues generalizing the findings and applying the outcomes to other institutions. However, since all of the respondents indicated that they use a combination of best practice frameworks to create and maintain their security policy set, it may be reasonably inferred that other institutions also follow recommended best practices. Additionally, Creswell and Plano Clark (2017) indicated that four study participants are enough to draw meaningful conclusions from a qualitative study.
A limitation that is related to the sample size is the fact that this study may not entirely be a phenomenological study. Even though Creswell and Plano Clark (2017) indicated that a study size of four was enough to draw qualitative conclusions from, a phenomenological study typically requires more data to fully understand the phenomenon in question. Polkinghorne (1989) suggested a sample size from five to twenty-five subjects to truly understand the unique nature of the problem under consideration. Due to the small sample size, this study could be considered a general qualitative study with some emphasis om an ontological perspective. According to Creswell and Poth (2016), an ontological perspective involves questioning the nature of reality, which is of more general concern than considering a specific phenomenon.

An additional limitation to the study was the focus on specific control families of the NIST RMF. The specific RMF control families considered in the study were access control, configuration management, contingency planning, incident response, personnel security, risk assessments, services and systems acquisition, and system and data integrity. These control families were chosen because it was likely that higher education institutions would have policies that cover those areas. Other areas could have been chosen to complement these control families, such as identity and access management, physical security, and media management.

Interpretation of Study Findings

Several inferences may be made from the study findings that answer the research question. This study's research question was: What strategies are needed by information security managers and officers to implement an industry standard, best practice cybersecurity framework at public higher education institutions?

One such strategy shown to be implemented and a significant inference drawn from the study

findings is that higher education institutions are indeed following industry best practices, even if the institutions do not always have a robust policy set. The best practice framework that was mentioned most often by the study participants was the NIST CSF. Respondents indicated they were aware of the various industry best practices and were striving to meet the best practice framework's recommendations while also conforming to legal and regulatory compliance requirements.

An additional strategy that maybe inferred is that for a security policy set, all documents need to be reviewed regularly to accommodate changing threat and vulnerability environments. Those institutions that indicated they had policies for the various areas asked about in the interview questions also indicated that they regularly review their policy set and make any appropriate changes. This policy set review falls in line with NIST RMF recommendations (NIST, 2013) and NIST CSF recommendations (NIST, 2018a). ISO 27002 also recommends regular review of the organizational policy set (ISO/IEC, 2018).

One overall theme in the study findings is that information security is essential regardless of the size of the institution. The study participants were employed at institutions of differing sizes, yet they all reported the need to understand where security threats come from and how to appropriately respond to them. To assist security managers in defining their attack surface, determining their threats, and determining mitigations to those threats, the managers used various industry standard frameworks. The frameworks provided direction as how to categorize an information system, categorize threats, select and implement appropriate mitigations, and assess the mitigations. All of these supports provided by frameworks help security managers reduce the risk that their institution is exposed to (NIST, 2018b).

Another overall theme expressed in the study findings is that having a robust policy and procedure set makes a difference in creating and maintaining an atmosphere of protection. All security managers reported having either policies, procedures, or both that helped strengthen the security posture of the institution. These policies and procedures created a new mindset among students, faculty, and staff regarding the importance of information security. The new mindset reinforced the fact that higher education institutions are targets for adversaries. As a result, information security managers felt they could better guide the actions of faculty, students, and staff through the use of policies and procedures. This falls in line with Moody et al. (2018), who stated that organizations need to become aware of security threats and act

accordingly as guided by policies and procedures; Moody et al. went on to state that training provided by information security personnel is vital to organization members understanding their specific roles in protecting information.

Practice Implications of Study Findings

Several practice implications maybe inferred from the study findings, including the implication that higher education institutions actively use information security industry best practices in their day-to-day operations. The problem to be solved as part of this study was determining how information security managers at colleges and universities may better apply information security best practices to their operations. The inference here is that institutions improve their security posture when using industry best practices.

An additional implication drawn from the study results is that one security framework does not necessarily apply to all situations. The study question dealt explicitly with the NIST RMF. However, the results showed that the NIST RMF is not a universal security framework. A framework that maybe better tailored to specific security environments is the NIST CSF. The NIST CSF allows for different security controls to be applied to any situation, making it more flexible for differing security landscapes (NIST, 2018a).

Recommendations for Further Research

This research maybe taken in several directions, including the further investigation of the application of the NIST CSF in colleges and universities. This research focused mainly on the NIST RMF, and the introduction of the NIST CSF into the results was an unexpected outcome. The NIST CSF maybe examined closely to determine the advantages of using it over the NIST RMF or other frameworks.

An additional avenue of further research involves the general application of the NIST CSF. One of the limitations of this study was the relatively small sample size. Different universities and colleges could be contacted to determine if they are using the NIST CSF in their day-to-day operations. The subsequent research may then be compared to this research to see if the findings hold across a larger sample. This study only considered public universities and colleges; subsequent research could eliminate that qualifier and include private institutions.

The study also only considered institutions in the United States. Further research could be conducted on institutions outside of the United States. Some information security frameworks are intended to be international, such as ISO 27000 (ISO/IEC, 2018). Determining whether international institutions adhered to a framework would be valuable.

Additional possible research relates specifically to the NIST CSF, including the implementation of the framework in higher education. As part of the CSF, NIST identifies three tiers that organizations maybe adjudicated against partial implementation: risk-informed implementation, repeatable implementation, and adaptive implementation (NIST, 2018a). These implementation tiers are designed for governmental and non-governmental organizations. Research maybe done to determine if any modifications need to be made to the implementation criteria to account for educational institutions' unique security environment.
Finally, an additional research topic could be to create a specific security framework for universities and colleges. Such a framework does not currently exist, so institutions are using existing frameworks such as the NIST RMF or NIST CSF. A specific framework that applies to education could be synthesized from existing frameworks, with security controls selected from existing catalogs. The framework and associated controls would still adhere to industry best practices.

This study determined how information security managers may apply an industry best practice framework's principles and practices, with specific attention to the NIST RMF. While institutions were using a modified version of the RMF, they were more often using the CSF. Study participants indicated that the CSF was more flexible for their particular needs, especially in security control implementation and assessment.
The implications for the practice are exciting and significant. The main implication is that higher education institutions have taken it upon themselves to use a framework that is best suited for their needs. At times, the selection of framework in use is synthesized from other frameworks into a workable solution. Security controls are implemented and assessed regularly, in accordance with information security best practices. Adherence to best practices, regardless of the particular framework chosen, provides the best opportunity to uphold information confidentiality, integrity, and availability, which are the main components of information security (NIST, 2013).

Further research may be conducted based on the findings of this study. Practical avenues of further research include investigating institutions of varying sizes, institutions in locations outside the United States, and determining what information security framework functions best in a changing threat landscape. Research specifically into the NIST CSF and its further applicability to higher education institutions could be undertaken. An investigation into and synthesis of a new education-specific security framework could be undertaken.

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Chapter 23 - Relationship between Physical Activity Participation and GPA: Report of National Survay among Asian American High School Students

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Chapter Highlights

- Relationships among students' physical-activity (PA), sports participation, physical health status, and academic performance have been explored in various academic venues, however, investigating Asian American students nationwide has not yet been covered.
- Using the latest national High School Longitudinal Study Survey data and the hierarchical regression approach analyzed, this study examined: How the extracurricular PAs, school attitudes, and other demographic variables impact on the participants' personal-health, and grade point average (GPA).
- Participants were 956 Asian American high-school students (AAHSSs). Findings confirmed the importance of participating in PA and identified the relationships between the relative factors.
- In brief, AAHSSs who participated in after-school PA (including sports) earned a higher GPA.
- This study revealed and explained why the way of distributing social resources to all American students is the key to having equal educational opportunities because variables that influence educational achievement included: school funding, teachers' qualifications, home environment, and physical education curricula that are suitable or not for the particular students' ethnicity cultural background, etc.

Introduction

Regularly participating in physical activity (PA) generates benefits for personal health, functional ability, and general quality of life became an unarguable fact and accepted by the public society (Powell & Pratt, 1996). In contrast, physical inactivity has become a major public health problem in most developed countries and has been recognized as a worldwide epidemic (Chief Medical Officer, 2004). This situation may become even worse, because research studies have predicted that: within the next two decades, the rate of childhood obesity in the United States will reach 40% or higher (Kopelman, 200). Researchers also predicted that by the year 2040, Type 2 diabetes will affect 300 million people globally (Zimmet, 2003). Therefore, educating young people on the benefits of PA, and facilitating opportunities for participation have become extremely meaningful tasks in the challenges of developing a healthier next generation. According to Sallis and Owen (1999), PA is defined as "any bodily movement produced by skeletal muscles that result in energy expenditure" (p. 1); this definition is generally accepted and recognized by the public. Moreover, regularly participating in Physical Activity has been verified as an effective strategy to improve and keep personal health. The PA Guidelines for Americans are a critical resource for health professionals and policymakers that provide recommendations on how youth can improve their health through regularly participating in physical activity (Office of Disease Prevention and Health Promotion, 2018). Castelli et al. (2015) stated "Because children spend so much time at school, schools have a unique opportunity to help children become healthier and more active." (p. 1). The Institute of Medicine has called on school leaders to offer more opportunities for children to be physically active before, during, and after school (Castelli et al. 2015). It is important to note that childhood obesity and poor academic performance in schools are highly associated with lower-income and minority status, segments of the population, which bear an unequal burden of poor health indices (Castelli et al. 2015).

To accomplish the goal of regular PA participation by Asian American students' educators, administrators, parents, and legislation must work together. Specifically, this task requires that these stakeholders identify the factors that Asian American students to participate in, or not participate in PA. Hence, conducting this investigation appears to be very important and necessary. The objectives of this study were to examine those contributing factors to Asian American high school students 'Physical activity participation' including *Perception of school safety, Socioeconomic status, and Other demographic factors.* It is important and

necessary to explore what the literature had to say about Asian American high school students' PA participation and their academic performance. Hence, the primary literature review and background would cover the *Effects of school physical education*, *Participation in organized sports*, *The debate on adolescents' PA participation and academic achievement, and the relationships between* physical activity, Cognitive function, and Academic performance from the previous research. Then, the 'Theory of Intersectionality', and 'Studies on academic performances of Asian American high school students would be addressed. Certainly, in the present study, we focus on relationships between *Personal-health, Physical activity participation, and Asian American high school students' Phys-Ed GPA.*

Effects of School Physical Education

Coe, Pivarnik, Womack, Reeves, and Malina (2006) examined the effects of physical education, class enrollment, and physical activity on the academic achievement of 214 6th-grade students. 9 Participants were assigned to execute 30-minutes blocks of moderate and vigorous physical activity (MVPA), outside of school. Their key finding was that physical education classes averaged only 19 minutes of MVPA. Students who either met some or met all of the 'Healthy People 2010 guidelines' for vigorous activity had significantly higher GPA ($P < .05$) in comparison to students who performed no vigorous activity over two school semesters. They concluded that although academic achievement was not significantly related to physical education class enrollment, a higher GPA was associated with MVPA; in one word, the higher the activity level, the higher the GPA the participants obtained.

Participation in Organized Sports

According to the Committee on Sports Medicine and Fitness and Committee on School Health (CSMFCSH, 2001) participation in organized sports provides an opportunity for young people to increase their physical activity and develop physical and social skills. However, when the demands and expectations of organized sports exceed the maturity and readiness of the participant(s), the positive aspects of participation can be reduced or invalidated. Meanwhile, the degree of parental support and involvement can also have a huge influence on the participation in organized sports of young people (CSMFCSH, 2001). Additionally, the organizations hosting after-school sports programs offer students the

opportunity to learn safety rules and use proper equipment and facilities due to the presence of trained coaches/instructors.

The Relationships among 'Physical Activity', 'Cognitive Function', and 'Academic Performance'

Using a very large sample, a longitudinal design, and a cluster-randomized trial methodology, Donnelly and Lambourne (2011) examined the relationship between physical activity, fitness, obesity, cognitive function, and academic achievements in a large sample (not specifically for Asian American students). The impact of classroom-based physical activity on body mass index (BMI) and academic achievement was assessed. Their 'Physical Activity Across the Curriculum Intervention Project' also supported the role of physical activity in the classroom. In brief, the participants who received the 'Intervention Project' did better in overall performance on a standardized academic test by six percent in comparison to those who did not receive the 'Intervention Project'. Their BMI also had significant ($p < 0.00$) improvement compared to those students who did not receive the 'Intervention Project'. Although further research studies are needed, their main conclusion was that the physical activity academic lessons provided greater intensity than other physical activity lessons because it was based on the scientific principles of development; therefore, students who participated in the intervention project obtained significant BMI and academic achievement related benefits.

The Debate on Adolescents' Physical Activity Participation and Academic Achievement

Although it is common knowledge that regular participation in physical activity will lead to positive personal health indices as well as psychological benefits, the relationship between adolescents' physical activity participation and academic achievement, requires additional clarification. Some studies have found little support for a positive relationship between physical activity and academic performance (Donnelly & Lambourne, 2011), while other studies have identified a negative relationship between physical activity participation and academic achievement (Castelli, et al. 2015; Coe, et al., 2006). However, a greater number of studies have reported positive physical health as well as better cognitive outcomes as a function of regular physical activity participation (e.g., in Donnelly & Lambourne's study; 2011).

A quantitative systematic literature analysis conducted by Fedewa and Ahn (2011) has clarified the argument. Their review included a total of 59 studies from 1947 to 2009. Results indicated a significant and positive effect of physical activity on adolescents' academic achievement and cognitive outcomes, with aerobic exercise generating the maximum effect. Several variables were also found to have a significant contribution to this relationship. Fedewa and Ahn (2011) also provided strategies to modify school-based policies regarding physical activity to improve children's academic performance. Castelli, et al. (2015) indicated that one in three children and adolescents in the US was overweight or obese; this overweight group had a higher risk of experiencing health problems such as heart disease, type 2 diabetes, unhealthy blood cholesterol patterns, and other health problems related to cardiovascular disease. Obesity can also cause serious consequences for children and adolescents' cognitive development and attending any extracurricular activities. Since children spent most of their time in school, schools are of cause a unique place for children to learn and develop knowledge and skills to become more healthy and active people (Castelli et al. 2015).

Several investigators have suggested that multiple factors that influence the health-related effects of physical activity; these factors include SES, perception of neighborhood safety, race, and gender (e.g., Hasson, 2017; Meyer, Castro-Schilo, & Aguilar-Gaxiola, 2012; Stokie, 2009). Hasson (2017) in his article "Addressing Racial/Ethnic Differences in Age-Related Declines in Physical Activity During Adolescence" suggested that there was evidence that showed racial/ethnic differences in school-age adolescent decline among adolescents who regularly participate in physical activity during their school hours.

The Theory of Intersectionality

Over the last three decades, many researchers have investigated gender differences in health (e.g., Beal, 2008; Bermúdez, Stinson, Zak-Hunter, & Abrams, 2011; Kiehne, 2016). Moreover, Crenshaw's Theory of Intersectionality (1991) identified how race, gender, and class intersected, and created unique experiences for minorities in American society. Specifically, this theory conveyed and illustrated the ways in which oppression occurred among specific races, genders, and social classes. Beal (2008) found that minority women faced 'double-jeopardy' by being both members of an exploited race, and a 'weaker' gender group. In recent years, investigators have focused on Blacks, Latinx, Asian Americans, and

women. For example, Bermúdez et al. (2011) in their study "Mejor Sola Que Mal-Acompañada: Strengths and Challenges of Mexican-Origin Mothers Parenting Alone", the researchers examined the importance of recognizing Mexican-Origin feminism and its relevance to Intersectionality theory. They stated that the primary reasons for incorporating Mexican-Origin American feminism into family research are to elucidate the strengths within the Mexican-Origin American community, to highlight women's experiences, and better understand the sources of their empowerment (Bermúdez et al., 2011).

Similarly, 'Intersectionality Theory' can be applied to other ethnic groups, such as the Asian American community, particularly when incorporating overlapping forms of identity such as race, gender, class, origin, citizenship status, and current geographic location in a multidimensional Approach. Utilizing multidimensional observations, Beam, Casabianca, and Chen (2011) reported that the quality of education available to Asian Pacific American students in the New York City public schools system is negatively influenced by multiple factors such as the inequitable distribution of teaching resources, large class-sizes, schools shut down, the qualifications and education as levels of educators and administrators, and the serious deficits in the cultural competence of educators and administrators. These factors affect the academic achievement of Asian Pacific American children and youth, as well as other communities of Color (Beam et al., 2011).

From a different perspective, Kiehne (2016) a researcher indicated that nativism, an aspect of the 'Intersectionality Approach', played a critical role in Asian American communities. However, it is important to understand, that the 'Intersectionality Approach' is born out of the lack of attention to gender identity. Brown and Battle (2018) suggested that because 'Intersectionality Theory' provides a broader theoretical perspective that situates race, class, and gender as a new field of intersection studies it has attracted the attention of many researchers worldwide. Multiple social stratums and social locations are experienced simultaneously and mutually reinforcing, and therefore all things must be considered in tandem rather than independently (Browne & Battle, 2018). These social factors are not always equal but are mutually impactful in relation to one another while serving as the basis for anti-discrimination and low-class life chances (Browne & Battle, 2018). Furthermore, Browne and Battle (2018) pointed out that this theoretical framework provides a powerful tool for analyzing the social, economic, and education status of various ethnic groups including Asian Americans.

Studies on Asian American High School Students' Academic Performances

There are both similarities and differences in the characteristics of intersectionality among Asian Americans, Black, and Latinx populations. Research studies focused on the Asian American population, however, are far less in number than their Black and Latinx counterparts; hence, the current study would utilize the methodologies and findings from the other two ethnic groups as a guide whenever relative discussion and analyses are needed. Fortunately, a diversity educator and a distinguished researcher from the Education University of Hong Kong conducted a research study, in which he provided a detailed description of how the 'Intersectionality theory' can play to the Asian American communities. In his article "Asian America and Education" Chang (2017) indicated that "The communities that constitute the racialized category of Asian Americans consist of approximately 20 million people in the United States or about 5% of the total population. About 20% or 4 million are of primary or secondary school age, and over 1.1 million are in higher education" (p. 1). These are critical points of view and factors related to the current study. Chang (2017) further described that: "Asian American generally refers to people who have ethnic backgrounds in South Asia (e.g., Bangladesh, India, Pakistan, Sri Lanka), Southeast Asia (e.g., Cambodia, the Philippines, Thailand, Vietnam), and East Asia (e.g., China, Japan, Korea, Taiwan). As "Asian American" is an umbrella term used to categorize a very diverse, heterogeneous, and transnational set of populations, Asian Americans as a group present various challenges to education and research in and about the United States (p. 1)."

Moreover, concerning the notions of 'intersectionality' and 'transnationalism' related to Asian American studies, Chang (2017) indicated, that, "Asian Americans are characterized as "the Model Minority" or "the Oppressed Minority" persist, the relevance of such static binaries has increasingly been challenged as the Asian American populations and migrations continue to diversify and increase (p. 1)". Based on the above description, conducting an investigation to address on Asian American high school students' issues related to the current topic is extremely necessary. In brief, the present study has the following hypotheses or needs to answer the following questions: (1) whether differences exist in cognitive function between the Asian American high-school students who participated in extracurricular physical activities or not. (2) Whether differences would exist in cognitive function between Asian American high-school students who perceive the school environment to be safe or not?

As we presented in the ‘Introduction’ section, those previous studies have limitations on the size of sampling, duration of the investigation, and data analysis techniques; the present study would overcome these limitations by employing the latest national survey - the High-School Longitudinal Study (HSLS). The HSLS was designed by the National Center for Educational Statistics, a primary federal entity for collecting and analyzing data related to the education status of multiple ethnic groups in the United States. This data set was the largest sample size in the topic of Asian American high-school students’ research study by far.

Specifically, the ‘Independent variables’ or the relative factors in the current study involved 11 meaningful variables; it is counted as the most extensive information collection for this topic ever, and using the ‘OLS Regression’ technique for determining different Models for the participants in the first attempt in the study of Asian American high school students. In brief, our expectations for this study are able to provide clear findings or statements on the status of Asian American high- school students’ sport participation, personal health, and their Phys-Ed GPA; provide meaningful suggestions for helping the policymakers to accept the 'Intersectionality' theory perspective, and to challenge them to enable to develop structural interventions that may affect on the current racism structure as well as other related factors, and so on.

Method

Data Collection and Participants

Data for this research was taken from the High School Longitudinal Study (HSLS). It was designed by the National Center for Educational Statistics (NCES), a primary federal entity for collecting and analyzing data related to education in the United States Note. The baseline survey was administered to 9th-grade students in 2009, and the sample size included 944 schools with over 23,000 students, and their parents, school counsellors, administrators, and teachers. Public, Private, and Catholic schools were all sampled and 9th grad students were randomly selected within each school. The first follow-ups began in 2012 when the majority of the students would be in the 11th grade. In 2013 high school transcripts were collected. Finally, the second/last follow-up occurred in 2016, which would be indicative for most students of a (3-year) post-secondary education phase, in which many students were either in college, employed, or have never attended college. The Institutional Review Board (IRB)

permission to conduct the survey; and the "Inform Consent' form from the participants were administrated by the NCES during the investigation and the three following up.

Dependent Variable

Physical Education GPA is a variable indicative of a student's grade point average for Personal Health and Physical Education courses. Courses under this terminology include traditional courses such as gym classes that are largely physical activity-based as well as courses tailored towards physical education such as learning about exercise and nutrition. We simplify the name of this variable as a Phys-Ed GPA. Grade point averages (GPSs) for this variable were reported on a 4.0 scale, with 4.0 being the highest, and 0 being the lowest, however, in this data set the lowest Phys-Ed GPA reported is 0.25.

Independent Variables

According to a review of the most relevant literature on our study topic (e.g., Battle, Alderman-Swain, & Tyner, 2005; Browne & Battle, 2018), the following independent variables were adopted: (1) 'Participated in Sports' is a dummy variable reflecting whether a student participated in organized sports outside of school (1 = yes, 0 = no). (2) 'Hours Spent on Extracurricular Activities' investigates the number of hours a student spends on extracurriculars on a typical school day. (3) 'Feels Safe at School' is a dummy variable that investigates whether a student feels safe in school or not (1 = yes, 0 = no). (4) 'School Pride' is a dummy variable that investigates whether a student is proud to be a part of their school or not (1 = yes, 0 = no). (5) Female is a dummy variable indicating student's gender, (1 = female, 0 = male). (6) Urbanicity is recoded into a series of dummy variables that reflect the schools' urbanicity. Individually included are City (1 for a city, 0 for all else), Town (1 for town. 0 for all else), and Rural (1 for Rural and 0 for all else), with suburban being the reference category. (7) South is a dummy variable indicating whether the school's region is in the south or not in the south (1 = south, 0 = not in the south). (8) Socioeconomic Status (SES) is a standardized variable reflecting socioeconomic status, which is a combination of income education, and occupational prestige. (9) Born in the U.S.A. is a dummy variable that investigates whether or not a student is born in the USA or not (1 = Born in the USA, 0 = another country). (10) Two-Parent Household is a dummy variable indicating whether or not

a student lives in any kind of two-parent household (1 = any 2-parent configuration, 0 = other).

As stated in the 'Introduction' section, some of the independent variables listed above have been used or adopted by researchers in previous studies, (e.g., Browne & Battle, 2018; Martens et al., 2014; Rothon, Goodwin & Stansfeld, 2012). Other researchers on this particular topic such as Hasson (2017); Meyer, Castro-Schilo, and Aguilar-Gaxiola (2012); and Stokie (2006) have used SES, perception of neighbourhood safety, race, and gender in their studies. Additionally, race, gender, class, origin, citizenship status, and current geographic location were also used in a multidimensional approach by many researchers (e. g., Browne & Battle, 2018; Fedewa & Ahn, 2011; Hasson, 2017). Therefore, it is clear that the current study employed valuable and reliable methods, techniques, and variables from the previous studies.

Models for Determining Participants' Phys-Ed GPA

To investigate the relationship between participating in physical activity and the 'Phys-Ed GPA' of Asian American students, three models were employed and analysed for all students and then calculate separately for male and female students, resulting in nine models in total. The first domain of Extracurricular activities included participation in sports and PA (the main independent variable) and Hours spent on extracurricular activities.

The second domain was a series of 'School attitudes' variables including 'Feels safe at school' and 'School pride'. The third domain introduces 'Demographic' variables such as Gender, Urbanicity, Region, Socioeconomic Status, Born in the USA, and two-parent household. Ultimately these three models were run again, that was: for the female students and the male students. The data analytics strategy was the hierarchical regression technique. All results can be found in the nine models (as presented in Table 2).

Results

The summary for the dependent and independent variables was present in Table 1 including the summary of the means, standard deviations, and other descriptive statistics for the dependent and independent variables (as presented in Table 1):

Table 1. Means, Standard Deviations, Ranges and Description of Variables for Asian High-school Students (N = 956)

Variable	N	Mean	S.D.	Range	Description: HSLS Variable NAME and Label
Dependent Variable					
Phys-Ed GPA	1755	3.54	0.71	0.25-4.0	X3 GPA: Physical Education
Extracurricular Activities					
Participated in Sports	1649	0.41	0.49	0-1	S2 F02D Participated in organized sports outside of school since fall 2009
Hours Spent on Extracurricular Activities	1608	2.21	1.26	1-6	S1 E15D Hours spent on extracurricular activities on typical schooldays
School Attitudes					
Feels Safe at School	1646	0.92	.27	0-1	Recode of 'S1 E01A 9th grader feels safe at school' to 1=agree, 0 = Disagree
School Pride	1635	0.88	0.33	0-1	Recode of 'S1 E01B 9th grader is proud to be part of his/her school' to 1 = agree, 0 = disagree
Demographics					
Gender	1952	0.50	.50	0-1	Recode of 'X1 Student's Sex' 1= Female, 0 = Male.
Urbanicity (Ref Suburban)	195				
City	1952	0.31	0.46	0-1	X1 School locale (urbanicity)
Town	1952	0.09	0.29	0-1	X1 School locale (urbanicity)
Rural	1952	0.22	0.42	0-1	X1 School locale (urbanicity)
South	1952	0.41	0.49	0-1	X1 School Geographic Region 1=South, 0=Other
Socioeconomic Status	3515	-0.16	0.73	-1.93 - 2.56	X1 Socio-economic status composite
Born in U.S.A.	1215	0.61	0.49	0-1	P1 B17 Whether student was born in the U.S.
Two Parent Household	1272	0.87	0.34	0-1	Recode of 'X1 P1-P2 relationship pattern' to 1= all two parent households, 0 = Other

The multivariate relationships among the rest of the variables were present in Table 2. In other words, ultimately, the nine models were run, three for all students, three for females, and three for males (see Table 2):

Table 2. OLS Regression on Personal Health and Physical Education Grades for Asian Students (N = 956) (Betas in parentheses) [a]

Predictor Variables	All Students (n = 956)			Female Students (n = 491)			Male Students (n = 465)		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model
Extracurricular Activities									
Participated in Sports	0.15***	0.15***	0.11***	0.18***	0.17***	0.14**	0.14**	0.14**	0.08
	(0.04)	(0.37)	(0.04)	(0.05)	(0.05)	(0.05)	(0.06)	(0.06)	(0.06)
Hours spent on Extracurricular Activities									
	0.13	0.00	0.00	0.02	0.02	0.01	0.00	0.00	-0.01
	(0.14)	(0.01)	(0.01)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
School Attitudes									
Feels Safe	---	0.12	0.08	---	0.10	0.05	---	0.16	0.14
		(0.08)	(0.08)		(0.10)	(0.11)		(0.12)	(0.12)
School Pride	---	0.13*	0.13*	---	0.20**	0.19**	---	0.06	0.04
		(0.06)	(0.06)		(0.07)	(0.07)		(0.10)	(0.10)
Demographics									
Gender	---	---	0.08*	---	---	---	---	---	---
			(0.40)						
Urbanicity (Suburban Ref Category)									
City	---	---	0.07	---	---	0.02	---	---	0.13
			(0.04)			(0.05)			(0.70)
Town	---	---	-0.01	---	---	-0.04	---	---	0.13
			(0.07)			(0.08)	---	---	(0.12)
Rural	---	---	0.02	---	---	-0.01	---	---	0.06
			(0.05)			(0.06)			(0.07)
South	---	---	0.12**	---	---	0.09	---	---	0.15**
			(0.04)			(0.05)			(0.05)
Socioeconomic Status	---	---	0.10***	---	---	0.09***	---	---	0.11***
			(0.02)			(0.02)			(0.03)
Born in U.S.A.	---	---	0.00	---	---	0.00	---	---	0.00
			(0.04)			(0.05)			(0.05)
Two Parent Household	---	---	0.07	---	---	-0.02	---	---	0.19**
			(0.05)			(0.06)			(0.08)
Constant	3.60	3.38	3.24	3.60	3.36	3.38	3.59	3.41	3.13
Adjusted R^2	0.018	0.027	0.069	0.032	0.048	0.067	0.009	0.012	0.066

[a] Information above is based on a listwise deletion of cases. *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

For the general sample, Asian-American students who participated in sports had a higher GPA (models 1-3) and that relationship was true for female students as well (models 4-6). However, for male students that effect was only true until Demographics were entered into the model (model 9). The hours spent on extracurricular activities had no effect on Asian students. Having pride in one's school for the overall sample had a positive relationship with

Phys-Ed GPA (models 2-3), and this also held true for female students (models 5-6), however, there was no effect for male students (models 8-9). The hours spent on extracurricular activities had no effect on Asian-American students. Having pride in one's school for the overall sample had a positive relationship with Phys-Ed GPA (models 2-3), and this also held true for female students (models 5-6), however, there was no effect for male students (models 8-9). The impact of SES is positive and robust, thus, the higher the SES the higher the Phys-Ed GPA across all models (models 3, 6, 9). Finally, while male students in Two-parents households had a higher Phys-Ed GPA than their counterparts in one-parent households (model 9), the parental configuration had no significant impact on Asian-American students.

As to the other variables such as: 'Having pride in one's school', 'Impact of SES', and 'Parental configuration'. The results of this study indicated that all Asian students who participated in PA demonstrated a positive relationship with a Phys-Ed GPA (Models 2-3 and models 5-6). The results of this study also found that the higher the SES, the higher the Phys-Ed GPA. Furthermore, students from 'Two-parents households' earned higher Phys-Ed GPA than students from 'One-parent households', which suggested that 'Parental configuration' did have a critical impact on the Asian High-School Students' PA, personal health, and Phys-Ed GPA.

Discussion

Using the latest national High School Longitudinal Study survey, adopting the hierarchical regression approach analyzed, and the Intersectionality theory. This study examined How the extracurricular physical-activities, school-attitudes, and other demographics variables impact on the 956 Asian American High school students' personal health and Phys-Ed GPA). Based on these research purposes, our discussion would be divided into the following sub-headings:

Differences in Cognitive Function as a Result of Sports Participation

Based on the results the first hypothesis, "no differences exist in cognitive function between the Asian high school students who participated in after-school sports or who do not participate" was accepted. For 'all Students', those who participated in after-school sports obtained a higher Phys-Ed GPA in comparison to their counterparts who did not participate;

this finding is consistent with previous studies (Chief Medical Officer, 2004). For example, the report delivered by the London Department of Health stated that school children that participated in PA at least five times per week had better health and higher academic performance (Chief Medical Officer, 2004). It is also consistent with the report of the Effect of physical education and activity levels on academic achievement in children by a previous research study (Coe et al. (2006). Thus, the current investigation confirmed their earlier research findings Coe et al. (2006) in their report about the "Effect of physical education and activity levels on academic achievement in children"; presented evidence that described and illustrate why the positive relationship exists between physical activity and academic achievement in children; how to obtain those positive relationships.

Moreover, Castelli, et al. (2015) in their findings illustrated that long-term research studies have shown that increases in physical activity level resulted in greater academic learning time spent in physical education, and significant improvement in academic performance, such as GPA. Their findings, however, were different from the reports by Kao and Thompson (2003) and Kuo, Chong, and Joseph (2008), who stated that the school and environment conditions, educational resources, and educators' qualifications, impacted the Asian American family and their children's PA participation and their academic performance.

Nevertheless, in 'parental configuration', our findings are consistent with several previous studies (e. g., Beal, 2008; Kao & Thompson, 2003; Rothon, Goodwin, & Stansfeld, 2012). Their studies found that: 'parental configuration' is matter; 'two-parents' households' had more times and better condition to participate after school sports program and earned a better Phys-Ed GPA than those kids who are in 'one-parent households'. Based on the above, the null hypothesis of no difference is rejected. Surprise, our findings partially contradict this point: the male students who participated in after-school sports did not earner a higher Phys-Ed GPA (see models 9); that seems not a reasonable result. The reasons behind this probably related to the limitations of this sampling.

All students who are from the region of the south had a higher Phys-Ed GPA than their counterparts who are not in the region of the south (see model 3). This relationship held true for all students and male students (see model 3 & model 9), but no regional differences for female students (see model 6). For the reasons behind this phenomenon, we speculate that this regional difference is a result of budgetary constraints. Since the year 2000, schools in

the South have received more funding for, renovations or upgrades in equipment and facilities than schools that were not in the South (e.g., Dortch, 2013; Leigh, 2012; Mcgowen, 2007).

With regard to the impact of SES, the findings were positive and robust, such that the higher the SES the more students reported participated in after school sports programs, and demonstrated a higher Phys-Ed GPA across three models (Models 3, 6, & 9) (see Table 2). This finding is consistent with the findings from several previous studies by Browne and Battle (2018), Martens et al. (2014), and Rothon et al. (2012). Finally, male students in 'two-parents households' earned a better Phys-Ed GPA than their counterparts (model 9). This finding is new to know.

The results suggest that parental configuration had very little or no significant impact on Asian American students although other ethnic groups might be impacted by parental configuration (Browne & Battle, 2018; Kao & Thompson, 2003; Kiehne, 2016; Rothon et al., 2012). As Browne and Battle (2018) indicated, "Racial differences in family structure have existed since at least the nineteenth century in the USA. However, beginning in the 1960s, the family structure underwent significant changes as structural and cultural forces significantly altered household structures." (p. 78).

Cognitive Function as a Result of Perceived Safety of School Environment

The results of the investigation supported the second hypothesis of "no differences exist in cognitive function between the high school students who perceive the school environment to be safe or who perceive not safe. As can be seen in Table 2, the 'Feels Safe' variable demonstrated no significant effect among Asian American students; which supports the hypothesis; therefore, the null hypothesis is accepted.

Regarding Differences in Cognitive Function as a Result of Gender and Region

Female students who participated in after-school sports demonstrated a higher Phys-Ed GPA (as showed in models 4-6). These findings are consistent with the findings of a previous study (e.g., Donnelly & Lambourne, 2011). These investigators also reported that female students who participated in organized sports demonstrated better academic performance.

Secondly, all students from the south region had a higher Phys-Ed GPA than their counterparts who were not from the south (see model 3). This relationship held true for all students, and male students (see model 9), but no regional differences were found for female students (see model 6). As stated above, we speculate that Southern schools have received more funding to upgrade, renovate and improve their equipment and facilities in comparison to schools that are not in the south (e.g., 2018; Dortch, 2013; Leigh, 2012; Mcgowen, 2007).

Lastly, the data revealed that Asian American male high-school students in 'two-parents' households' did not earn a better Phys-Ed GPA as of their females' counterparts (model 9), but no previous studies have identified this issue among Asian American high-school students. Thus, the parental configuration has no significant impact on the Asian American students' education, because traditionally Asian people are always put their children's education as the first priority of their family. Even though other ethnic groups' families might be impacted by their parental configuration (e.g., Browne & Battle, 2018; Kao & Thompson, 2003; Kiehne, 2016; Rothon et al., 2012).

Conclusion

This study contributes to the research of Asian-American High School Students' personal health, PA, ports participation, and academic achievement, wherein we try to explore how those dependent variables (or relative elements) impact these Asian-American High-School Students' personal health, sports participation, and their GPAs. In conclusion, Asian-American High School Students who participated in after-school PA and sports programs had higher GPAs. There is no significant impact on their GPAs from Asian-American High School Students' hours spent on extracurricular activities.

Overall, Asian-American High School female students had a higher GPAs than their male counterparts; students in the South had higher GPAs than their counterparts not in the South, but there were no regional differences for female students. For Asian-American high school students, socioeconomic status had a positive impact on educational outcomes, that is: the higher the SES, the higher the GPAs. Generally speaking, the parental configuration had no significant impact on these Asian-American students, but male students in 'two-parents households' had higher GPAs than female students in 'one-parent households.

Implications and Recommendations

Multiple previous studies have confirmed that ethnic group, economic class, and gender elements simultaneously impact on minority American students' personal health, sports participation, and educational achievement. Our findings possess many similarities with those previous studies (e.g., Battle et al. 2005; Beam et al. 2011; Browne & Battle, 2018). Their main point of view was: minority American's family, communities, and quality of education are formed by social forces including public policy, neoliberalism, culture, and structural discrimination that exert disparate racial, gendered education unequal distribution of resources have negatively impacted minority American students' families and communities, and adversely shaped the educational attainment of these minority American students (including the Asian American students).

Our findings supported the findings of these previous researchers who pointed to the role of social forces, the larger political economy, and structural discrimination in shaping household class structure. These social factors also strengthen the contention that household structure can be a poor proxy for educational outcomes of Asian children; rather, cultural capital and socioeconomic status may exert a greater impact on educational outcomes (e.g., Chang, 2017; Kao & Thompson, 2003; Kuo et al., 2008). Griffin and Allen (2006), and Browne and Battle (2018) indicated that the SES was more crucial in influencing children's educational outcomes than the household structure. Although their studies were conducted in Black households, we speculate that as a minority ethnic group the Asian American's experience is similar to the Black American households to some degree; hence, their findings are meaningful and can be a helpful reference to the Asian American family and students.

Likewise, researchers have maintained that the dominant focus on household structure - particularly to those single parent's family and educational achievement - deflects attention from the role of racism (e.g., Browne & Battle, 2018; Chang, 2017; Kuo et al., 2008). The findings from the current study supported the results of previous studies and suggested that the Asian family and community should play a key role in the effort to gain access to significant variables that influence better educational outcomes. Our study helps to further explain the importance of redistributing social structures in order to create equal opportunity for Asian American students. Multiple studies have identified variables that influence educational achievement such as, residential segregation, peer influence, school funding,

quality teachers, home environment, and challenging curriculum, as well as more suitable Asian American students' physical education curricula. From this perspective, this paper suggests that further research need to highlight the public policy practitioners and education researchers to further address the broader structural context that impacts Asian high-school students' academic achievement related to multiple factors; because America's racialized history of state-sponsored residential segregation requires that those seeking to address Asian American students' personal health, participation in sports and educational achievement must look beyond the scope of family and community structure, and explore the role of different resources.

Lastly, the findings of this study provided meaningful information on personal health, PA and sport participation, and the Phys-Ed GPA in Asian American high-school students based on the National High School Longitudinal Study data set. The results of this study might help the policymakers to accept the intersectionality theory perspective, and to challenge them to develop structural interventions that might also affect structural racism, and other related variables, therefore, contributing to our understanding of and progress in addressing educational inequity.

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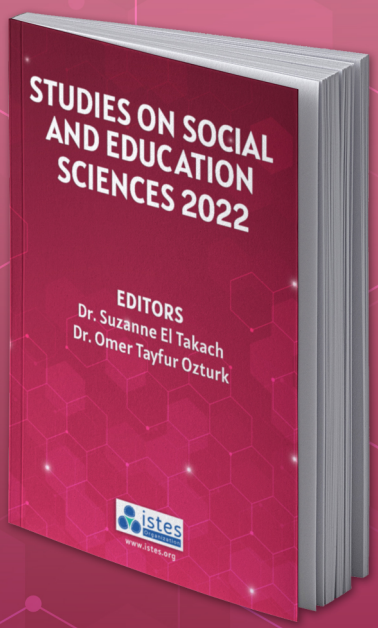

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