STUDIES ON SOCIAL AND EDUCATION SCIENCES 2025

Editors
Prof. Dr. Mustafa Koc
Dr. Omer Tayfur Ozturk

www.istes.org

Studies on Social and Education Sciences 2025

Editors

Prof. Dr. Mustafa Koc, Suleyman Demirel University, Turkiye
Dr. Omer Tayfur Ozturk, Necmettin Erbakan University, Turkiye

ISBN: 978-1-952092-87-9

Date of Publication
December 2025

Publisher
ISTES
Monument, CO, USA

Contact
International Society for Technology, Education and Science (ISTES)
www.istes.org
istesoffice@gmail.com

Citation

Koc, M. & Ozturk, O. T. (Eds.). (2025). *Studies on Social and Education Sciences 2025*. ISTES.

Table of Contents

Chapter 1 - Attitudes and Practices of College Art Teachers towards Culturally Responsive Teaching in Art Creation Courses.....1

Chapter Highlights 1

Introduction 2

Methodology 5

Interview Methods and Implementation 6

Data Analysis Methods 7

Theoretical Framework 7

The Integration Point between College Art Creation Courses and Culturally Responsive Teaching 8

Attitude Analysis of College Art Teachers 9

Analysis of Teacher Attitude Situation 10

Factors Influencing Teachers' Attitudes 11

Practical Exploration of College Art Teachers 12

CRT Reshapes Teachers' Artistic Education Concepts and Enhances Teaching Skills 12

Regional Cultural Construction - Database and Curriculum Practice 13

Establish A Process-oriented Cultural Feedback and Evaluation Mechanism 14

Conclusion 17

References 18

Chapter 2 - International Research on College Students' Perceptions regarding the Impact of the Lasallian Mission on Their Development.....21

Chapter Highlights 21

Introduction 22

Purpose of the Research 25

Research Questions 25
Theoretical and Conceptual Framework 26
Metatheory of Spiritual Formation 26
Lasallian Spirituality 28
Literature Review 29
Historical Background of Lasallian Higher Education 29
Historical Background of American Catholic Education 30
Historical Background of Lasallian Education 31
Historical Background of Lasallian Higher Education 32
Institutional Mission 34
Measurement of the Mission 35
Measurement of the Lasallian Mission 36
College Student Development in Lasallian Education 37
Holistic Student Development 38
Academic Development in Lasallian Education 40
Spiritual Development in Lasallian Education 41
Social Development in Lasallian Education 42
Career Development in Lasallian Education 43
Method 44
Research Design 44
Participating Institutions 45
Participants 52
Instrument 52
Data Collection 55
Data Analysis 56
Results 57
Demographic Information 58

Statistical Findings 63
Results of Research Question 1 67
Results of Research Question 2 70
Results of Research Question 3 77
Discussion 88
Conclusion 89
Lasallian Mission Understanding and Lasallian Mission Value 89
Lasallian Mission Value and Lasallian Mission Impact 90
Previous Lasallian Education Experience, Lasallian Mission Value, and Lasallian Mission Impact 92
Research Limitations and Recommendations 94
Research Limitations 94
Recommendations for Future Practice 94
Recommendations for Future Research 95
Acknowledgements 95
References 96
Chapter 3 - The Unseen Revolution: Unlocking the Potential of Cross-Disciplinary Research 104
Chapter Highlights 104
Introduction 105
Defining the Spectrum 106
Addressing the Stagnant Innovation 107
Unseen Revolution in Action 108
The Biomimetic Future 109
The Quantum Leap 109
Understanding Human Behavior at Scale 110
Design for Humanity 110
Strategies for Promoting Collaboration 111

Breaking Down Institutional Barriers 112
Cultivating a Collaborative Mindset 112
The Role of the Individual 113
The Acceleration of the Unseen Revolution 114
A Call to Action 115
Solving Today's Grand Challenges 116
References 117
Chapter 4 - The First Women Painters ın Turkish Painting and Their Development.....122
Chapter Highlights 122
Introduction 123
First Turkish Women Painters 125
Mihri Rasim 125
Vildan Gizer 129
Müfide Kadri 130
Celile Hikmet Uğuraldim 132
Emine Fuat Tugay 133
Naciye Tevfik and Meliha Zafir 135
Academic and Artistic Views of the İnternational Art Community 135
Thematic Trends: Form, Theme, and Gender 137
Conclusion 138
References 138
Figures 141
Chapter 5 - Enhancing Research Methodology: The Role of Embedded Librarians in Supporting Academic Excellence 143
Chapter Highlights 143
Introduction 144
Online Public Access Catalog 144

Figure 2. Pendeta OneSearch Interface Searching 145
Open Source Platforms 145
A-Z Online Databases (subscribed databases) 150
Analytical analysis Databases (WOS and Scopus) 151
Data Management Software (EndNote software) 153
Data Analysis 154
Research Methodology Built Environment Faculty (BVX8001/BMX700) 155
Research Methodology Science Faculty (SMX7001) 157
Research Methodology Faculty of Sports and Exercise Science (VQX7001) 158
Integrated Summary of Findings 160
Recommended Suggestions (Cross-Session) 160
Conclusion 161
References 161
Chapter 6 - The Role of Interdisciplinary Approaches in Addressing Global Challenges 163
Chapter Highlights 163
Introduction 164
Purpose 165
Method 166
Theoretical Foundations for Interdisciplinary Education 166
Development of the Conceptual Framework 166
Development of the Conceptual Framework 168
Results and Discussion 168
Project Case Study 1: Avionics Fault Diagnosis System 168
Project Case Study 2: Life Support & Safety Evacuation Protocol 170
Quantitative Outcomes 171
Qualitative Feedback and Thematic Insights 171
Challenges and Mitigation Strategies 172

Measuring Success: Metrics and Evidence 174
Conclusion 174
Recommendations 176
References 177
Chapter 7 - The Uses of Artificial Intelligence to Improve Scientific Research to Confront the Problem of Extremism (A Field Study on Egypt) 181
Chapter Highlights 181
Introduction 182
The Study Problem 183
Objectives of the Study 188
Methodology 188
Theoretical Framework 188
The Difference between Automation and Artificial Intelligence (AL) 189
The Importance of Artificial Intelligence 189
Challenges Facing Artificial Intelligence in Education (al Shipment, 2021: 199-200) 189
The First Axis: The Use of Artificial Intelligence in Improving Higher Education Outcomes 190
The Concept of Scientific Research 190
The Importance of Scientific Research 191
Objectives of Scientific Research 192
Benefits of Scientific Research 192
Types of Scientific Research 193
Obstacles to Scientific Research in Egypt 193
Obstacles related to Scientific Research Institutions (Arnaut, 2020: 20) 194
Benefits of the Applications of the Fourth Industrial Revolution in the Field of Scientific Research Development (Mohammed, 2021: 1468) 195
Applied Models for the Application of Artificial Intelligence in Egyptian Universities in the Development of Scientific Research 195

The Use of Augmented Reality in Teaching Scientific Research Methods Methods 196
Artificial Intelligence Tools and Applications to Improve Scientific Research Outputs 197
The Second Axis: The Use of Artificial Intelligence in Confronting Extremism 200
The Concept of Extremism 201
Explanation of the Phenomenon of Extremism 201
Types of Extremism 202
Factors Leading to Extremism and Helping to Make it 202
The Role of Education in Countering Extremism and Violence 203
University Strategies in Confronting Extremism 203
The Role of University Professors in Confronting Extremism 203
Egyptian Efforts to Enhance the Role of Gender to Prevent Extremism 204
Applications of Artificial Intelligence in the Face of Extremism and Violence 206
Study Recommendations 208
References 209

Chapter 1 - Attitudes and Practices of College Art Teachers towards Culturally Responsive Teaching in Art Creation Courses

Dr. Wang Xi, Associate Prof. Du Hai Tao

Chapter Highlights

- This study takes the attitudes and perspectives of Chinese art teachers in the process of art creation teaching as the research object and analyzes the integration of Cultural-Responsive-Teaching (CRT) strategy into undergraduate art education practice. The study used a semi-structured interview method to analyze teachers' theoretical identification with CRT, practical application barriers, and influencing factors.
- Research has found that most teachers recognize the value of culture-responsive teaching in cultivating students' cultural identity and innovation abilities and acknowledge the integration of multicultural elements into the teacher system.
- Attitude analysis shows that the teacher group exhibits contradictory characteristics of "high cognitive acceptance and weak practical initiative".
- The study proposes to establish a teacher development system that combines cultural consciousness cultivation with teaching skill enhancement; develop a course resource platform consisting of a regional cultural database and an interdisciplinary case library, and establish process-oriented cultural evaluation indicators.
- The conclusion points out that the effective implementation of culturally responsive art teaching needs to break through the traditional teaching paradigm dominated by techniques, stimulate teachers' cultural transformation ability through systematic support mechanisms, and suggest that future research can be expanded to compare differentiated practice models in different regional universities.
- The research should expand the sample range, explore more diversified evaluation tools, focus on the integration and innovation of culturally responsive teaching with other teaching models, and pay attention to the impact of cultural responsive teaching on students' long-term artistic development, to promote the in-depth development of cultural-responsive teaching in art education in universities.

Introduction

Culture-responsive teaching (CRT) has become an important teaching method aimed at addressing the growing diversity and demand for educational equity. The core of CRT is to encourage educators to fully utilize students' cultural backgrounds as assets in the learning process (Luo, 2022). Culture-responsive teaching (CRT) acknowledges the importance of integrating students' cultural backgrounds into various aspects of their learning experience (Gay, 2010). CRT is associated with increasing student engagement and grades in various situations (Luo, 2022). However, despite the bright prospects of CRT, translating it into classroom practice is often challenging, and many educators find it difficult to effectively implement these principles (Abacioglu, 2020). The tension between theory and practice makes it crucial to examine how teachers understand and implement CRT, especially in professional fields such as art education (Abacioglu, 2022).

In recent years, discussions on cultural relevance and inclusivity have become increasingly intense in the field of art education. Art classrooms are increasingly seen as spaces for expressing and examining cultural identity and diversity. Education workers are urged to turn the curriculum into a "mirror and window" - a "mirror" that reflects students' own culture and a "window" that allows them to understand the culture of others. Contemporary theoretical frameworks, such as culture-related teaching methods, critical multicultural art education, and cultural sustainability teaching methods, guide art teaching practice. For example, Buffington and Bryant (2019) call for changing practices through the use of cultural continuity teaching methods in art education, aimed at empowering learners by recognizing their cultural identity. Similarly, Desai (2020) argues that art education that promotes social change needs to focus on socio-political issues and enhance the visibility of marginalized perspectives. These views are consistent with CRT's emphasis on linking art learning with students' life experiences, community history, and justice issues. In practice, this may involve expanding the art curriculum to include diverse artists and visual cultures, encouraging students to create works of art about their own traditions or social experiences, and critically examining how art can both reflect and challenge cultural norms. Recent case studies have demonstrated this shift: for example, the "Mirrors and Windows" project, in collaboration with art educators, demonstrates a desire to transform art education into a culturally sustainable practice (Tajima, 2024). In this study, the teaching syllabus was redesigned to

enable classroom art creation to more effectively affirm students' cultural backgrounds and handle different narratives (Tajima, 2024). These measures indicate that the art education community is actively seeking ways to make teaching more culturally responsive and inclusive.

Teacher attitude and professional development are key to the successful implementation of CRT. Research has shown that few teachers are initially able to effectively bridge cultural differences in the classroom (Bottiani, 2017). Even though the CRT framework has gained recognition for promoting fair learning, the evidence base on how to train teachers to use these methods is still limited. A systematic review of on-the-job interventions found that only ten empirical studies on cultivating educators to engage in culturally responsive practices did not meet strict standards and could not ultimately prove their effectiveness (Bottiani, 2017). This highlights the gap between the strong theoretical support of culture-responsive teaching (CRT) and the practical guidance available to teachers. However, emerging empirical research findings reveal factors that promote culture-responsive teaching. For example, a recent quantitative study in the Netherlands examined specific teacher qualities that support culture-responsive teaching (Abacioglu, 2022). Research has found that educators with more positive multicultural attitudes and stronger empathy skills tend to use CRT strategies more frequently in the classroom (Banks, 2006). It is worth noting that teachers' empathy and empathy skills are the strongest predictors of their participation in culturally and socially sensitive teaching (Abacioglu, 2022). These research findings suggest that cultivating certain traits in teachers can promote culturally sensitive teaching practices. The author concludes that teacher education should incorporate experiences of empathy and reflective exercises, as these skills are malleable and can be acquired through training. This insight emphasizes the importance of examining teachers' attitudes: how teachers perceive cultural diversity and their role in addressing it will determine whether and how they adopt culture-sensitive teaching in their teaching.

The background of undergraduate art education in China provides a unique and important environment for exploring these issues. Traditionally, art education in Chinese higher education has emphasized exquisite techniques, classic knowledge, and teacher-led teaching methods (Li, 2024). Influenced deeply by cultural values such as respect for history and order, the Chinese art curriculum often prioritizes the acquisition of established artistic norms and standardized skills (Li, 2024). In terms of teaching methodology, this model is reflected

in teacher-led classrooms, which focus on replicating classic techniques and imparting respected content, leaving relatively less space for personal cultural expression or critical dialogue. Although this method effectively protects cultural heritage and standards, it may inadvertently marginalize students' personal cultural experiences or non-mainstream art forms. However, in the broader social transformation, the educational landscape in China is changing. The student population of universities is becoming increasingly diverse, including not only Han Chinese students but also ethnic minority students from within China, international students, and Chinese students who bring diverse regional cultures and global influence.

In recent policy discussions, the Chinese education sector has begun to emphasize the value of cultural responsive teaching methods, especially in revitalizing education in underdeveloped areas. It is worth noting that Chinese art educators advocate cultural responsive teaching methods as a means of protecting local cultural values in the context of rapid modernization (Luo, 2022). For example, Xie Zhixiong (2014) documented efforts to integrate folk art and traditions from rural communities into school art curricula to enhance students' cultural pride. The Ministry of Education (2019) issued guidance that echoes these concepts, encouraging rural art teachers to design "local art courses" that incorporate local cultural elements, thereby enhancing students' cultural identity (Luo, 2022). This represents an important shift in the official stance, recognizing that combining teaching with students' cultural backgrounds can enrich learning content. Preliminary research in China suggests that applying culture-responsive art education in art education has both potential benefits and challenges. The ethnographic study by Ning Luo and Tao Gua (2023) explored cultural and artistic projects in rural towns in China and found that participating students made significant progress in art, personal, and social aspects.

The project not only enhances students' artistic skills but also strengthens their confidence and appreciation of local cultural heritage through artistic activities that reflect their personal experiences. However, challenges were encountered during project implementation, such as limited resources and difficulties in integrating community cultural content with formal courses. Research shows that although children's art education may be effective in the Chinese context, it needs to be adjusted according to local conditions. In addition, compared to English research, there are relatively few empirical studies on the educational environment

in China (Luo, 2022). In China, especially in the "artistic creation" classroom of higher education, the advantages, obstacles, and subtle differences of culture-responsive teaching have not been fully documented. Given that China's higher art education is at the intersection of inheriting national culture and participating in global contemporary art dialogue, this gap is particularly significant. Understanding how art teachers in Chinese universities respond to cultural diversity in their teaching can provide valuable insights for local improvement and global dialogue on art education and diversity.

Because of this, this study explores the attitudes and practices of Chinese university art teachers towards culturally responsive teaching in art creation classrooms. By focusing on undergraduate studio art courses (where students engage in artistic creation under the guidance of teachers), this study examines how teachers perceive the concept of culturally responsive teaching and the extent to which they integrate cultural diversity content and response strategies into their teaching. The integration of global educational innovation and local cultural backgrounds has raised some important questions: Do Chinese art educators feel the necessity of culturally responsive teaching methods? How do they strike a balance between these methods and the long-standing artistic traditions and curriculum? What challenges do they face in attempting a cultural response? What support may they need?

This study aims to provide effective strategies for art educators and policymakers to promote the inclusivity and cultural richness of art education in Chinese universities, and to offer recommendations for future research and teacher development in this critical field. The following chapters will provide a detailed introduction to the conceptual framework, research methods, and research results on the attitudes and practices of Chinese university art teachers in implementing culture-responsive teaching.

Methodology

This study adopts a qualitative research paradigm, focusing on the cognitive and practical logic of college art teachers towards culture-responsive teaching (CRT). Through a combination of in-depth interviews and theoretical analysis, the study systematically explores teachers' attitudes, practical barriers, and influencing factors. The specific method design is as follows:

Interview Methods and Implementation

Interview Design

Using a semi-structured in-depth interview method, design an interview outline around the framework of "cognition practice reflection in culture responsive teaching", including the following dimensions:

Theoretical identification: cognition and value judgment of CRT core concepts (cultural relatedness, identity empowerment, critical cultural dialogue).

Practical strategies: course design, selection of cultural materials, and specific teaching behaviors in student interaction;Obstacle factors: external limitations such as institutional support, resource acquisition, evaluation mechanisms, as well as internal challenges such as teachers' ability to transform culture.

Improvement suggestion: The demand for the school support system and teacher development.

Participant Selection

Sampling strategy: Using purposive sampling, 18 art teachers from a teacher training university in a certain region of China were selected, covering three categories: undergraduate, master's, and doctoral, with professional directions such as painting, design, and theory, and teaching experience of more than 5 years to ensure sufficient teaching experience.

Table 1. Information about Participants

Interviewee	Number	Institution	Duration
professor	6	A certain normal university	40 minutes
associate professor	7		
lecturer	5		
Total	13		720 minutes

Source: The researcher

Sample characteristics, age, and gender are not limited. Including titles such as lecturer, associate professor, and professor, with 76.9% holding associate professor or higher titles.

Data Collection

Each interview lasts for 40 minutes, with the entire process recorded and transcribed into a written manuscript. Member Checking is conducted to ensure reliability; Synchronize the collection of physical materials such as teacher lesson plans and student works for triangulation.

Data Analysis Methods

Theme Analysis Method

Firstly, the collected data is transcribed into text and open coded using NVivo software: key statements in the interview text are marked sentence by sentence, and repeated items are merged to form 35 concept labels such as "cultural material scarcity" and "single evaluation criteria".

Table 2. Information about Data

Original Statement (Excerpt)	**Initial Code**	**Concept Classification**
Theoretical courses always revolve around historical topics and lack ethnic or local characteristics.	Lack of cultural materials for course content	Single cultural element
“The auxiliary tools available in the classroom are limited and not closely related to culture.”	The pressure of teaching technology	Imbalance between teaching skills and cultural literacy
“Students rarely ask questions during or after class, and sometimes they don't understand whether they can understand	The interaction between students and teachers is inadequate, and feedback is not timely.	Lack of a comprehensive feedback mechanism

Source: The researcher

Theoretical Framework

This study combines cultural responsive teaching theory (Gay, 2010) with socio-cultural

theory (Vygotsky, 1977) to explain the underlying mechanisms of the contradiction between attitude and practice. Analyze how teachers can transform local/global cultural elements into teaching resources, with Gay's "cultural relatedness" and "dynamic cultural adaptation" as the core.

Teacher agency theory (Albert Bandura, 1977): Interpreting institutional and cultural factors that constrain teacher practice from the perspective of structural agency tension.

Critical Theory of Art Education (Hickman, 1988): Examining the conflict between the dominant paradigm of traditional techniques and culturally responsive teaching, proposing a path for the transformation of teaching paradigms.

The Integration Point between College Art Creation Courses and Culturally Responsive Teaching

This study analyzed the profound connection and multiple points of convergence between art creation courses in universities and culturally responsive teaching. This includes the teaching philosophy of art creation as a way of cultural expression and communication, respecting students' cultural backgrounds and individual differences, and enriching students' artistic perspectives and aesthetic experiences.

Firstly, cultivate students' cultural identity and critical thinking. Students can analyze the symbolic meanings of patterns in different cultures, such as Chinese cloud patterns and Arabic vine patterns, and consider their potential for transformation in contemporary art. For example, students use ink painting as a medium to deconstruct and restructure their cultural symbols. Teachers provide personalized guidance. As an important carrier of cultural expression, art needs to use CRT to help students understand the artistic language of different cultures and promote cross-cultural empathy. Art creation, as an intuitive form of artistic expression, is not only a combination of skills and inspiration but also a transmission of culture and emotions. Through culture-responsive teaching, students can gain a deeper understanding and appreciation of artworks from different cultural backgrounds, enriching their artistic perspectives and aesthetic experiences.

Secondly, situational teaching promotes students' perception of artistic creation in different contexts. In college art creation classes, teachers can introduce diverse teaching resources and cases to guide students to explore artistic creation and expression in different cultural contexts. On the other hand, culture-responsive teaching encourages teachers to pay attention to individual differences among students, provide personalized teaching guidance, and thus stimulate students' creative enthusiasm and potential. This teaching method can not only help students form unique artistic styles and aesthetic concepts but also cultivate their innovative consciousness and critical thinking.

The impact of culture-responsive teaching CRT on art education is mainly manifested in the fact that this teaching method can enhance the inclusiveness and diversity of art education. Chinese art schools serve diverse student groups from different ethnic groups and local cultures. CRT can encourage teachers to integrate local, ethnic, or marginalized cultural issues into the curriculum, enriching creative themes. For example, by introducing the artistic traditions of our ethnic group (such as Chinese style patterns and Indigenous local narratives), we can stimulate the interaction between society and the artistic ecology. Contemporary art creation increasingly focuses on the cultural identity of artists. CRT teaching can cultivate young artists with a stronger sense of social responsibility and promote artistic participation in social change. In this study, the purpose of CRT is to make art teaching and learning more culturally meaningful by combining their "cultural knowledge", previous experiences, reference frameworks in teaching and learning, and artistic creation styles.

Attitude Analysis of College Art Teachers

Teachers consciously integrate multicultural perspectives into their teaching, respect students' cultural backgrounds, and convey cultural inclusivity through artistic creation. In college art education, it may be reflected as:

Firstly, the course content covers local/international artistic traditions.

Secondly, encourage students to create based on their own cultural experience.

Thirdly, critically analyze cultural symbols in art.

Analysis of Teacher Attitude Situation

In the questionnaire survey, this study designed questions covering multiple dimensions such as culturally responsive teaching philosophy, implementation difficulties, and effectiveness evaluation. Through semi-structured interviews, the attitude of art teachers at a certain normal school in China towards this emerging teaching model was understood, mainly focusing on the following three aspects: firstly, the recognition of the necessity of culturally responsive teaching, such as whether they believe it can enhance students' cultural sensitivity. And the evaluation of one's cross-cultural teaching ability. In the process of teaching experiments, teachers' emotional changes, such as morning reading, positivity, or anxiety, such as worrying about cultural issues causing controversy. Thirdly, the inclination and improvement of curriculum design, such as whether students hope to incorporate more cultural elements and their attention to cultural integration into the curriculum.

The research results show that over 80% of the surveyed teachers agree with culture-responsive teaching and believe that it plays an important role in improving students' cultural literacy and innovation ability. Especially among associate professors and professor groups, they generally believe that by integrating students' cultural backgrounds, teaching can be more closely aligned with students' real-life situations, thereby increasing students' interest and participation in learning.

Among them, some young teachers are passionate about the concept of culture-responsive teaching. They believe that in the context of globalization, a single cultural perspective is not sufficient to meet the needs of students. They believe that culture-responsive teaching can broaden students' horizons, deepen their understanding of multiculturalism, enhance cultural literacy, stimulate innovative thinking, and cultivate artistic talents with international perspectives and creativity.

The survey results also show that not all teachers have a completely positive attitude towards culture-responsive teaching. About 15% of the surveyed teachers stated that although they understand and agree with the concept of culture-responsive teaching, they have encountered many difficulties in practical operation. The main issue is how to accurately understand and grasp the diverse cultural backgrounds of students. Due to students coming from different

regions and ethnicities, there are significant differences in their cultural backgrounds, values, lifestyles, etc., which pose challenges for teachers when formulating teaching strategies.

5% of teachers also hold a neutral or conservative attitude. They believe that although culture-responsive teaching (CRT) has its unique value, traditional art teaching methods still have irreplaceable advantages.

Some teachers also reflect that culture responsive teaching places higher demands on teachers' professional competence and teaching ability. In order to implement this teaching model, teachers not only need to have solid knowledge of art, but also need to have the ability to communicate across cultures, design courses, and flexibly apply various teaching methods.

Although some teachers hold a conservative or neutral attitude towards culture responsive teaching, they do not completely deny the value of this teaching model. On the contrary, they hope to receive more support and guidance during the implementation process in order to better integrate this teaching philosophy into their teaching practice.

Factors Influencing Teachers' Attitudes

When conducting in-depth research on the attitudes of art teachers in universities towards culture responsive teaching (CRT), the study found that the viewpoints among the teacher group are not singular but exhibit significant diversity. This diversity not only reflects the educational background and teaching experience of teachers but also reveals their different views and expectations for the future development of art education (Ciddi, 2025; Tekin, 2025). The interview revealed the underlying reasons for teachers' attitudes towards culture-responsive teaching, including personal experience, educational philosophy, and school culture. Teachers with rich experience in multicultural teaching are more likely to accept this concept, while teachers under traditional teaching modes need more time to adapt. College art teachers have diverse attitudes towards culture-responsive teaching (CRT), reflecting differences in personal experience and educational philosophy, as well as opportunities and challenges in the field of art education. To promote innovation in art education, it is necessary to have a deep understanding of teacher needs, provide customized training and support, and jointly develop suitable educational models. Specifically, as follows:

Firstly, personal experience. The art education experience received by teachers themselves will significantly affect their acceptance of culture-responsive teaching. Teachers who have received multicultural education or cross-cultural training are more inclined to adopt this teaching method. Cultural identity and awareness: Teachers' recognition of their own cultural identity and their open attitude towards other cultures are important influencing factors. Teachers with strong cultural awareness are more likely to integrate multicultural elements into teaching practice.

Secondly, there is a degree of freedom in curriculum design. The higher the structural flexibility of art creation courses, the easier it is for teachers to try cultural responsive teaching methods. An overly standardized curriculum framework will limit the space for teaching innovation.

Thirdly, social and cultural factors. The complexity of cultural backgrounds among students in a class will prompt teachers to adjust their teaching strategies. The multicultural student community provides practical needs and motivation for culture-responsive teaching. The trend of emphasizing cultural dialogue and cross-border integration in contemporary art education will affect teachers' judgment and choice of teaching values.

Practical Exploration of College Art Teachers

Based on the above analysis, this study combines the cultural responsive teaching concept to develop a course resource platform for regional cultural databases and interdisciplinary case libraries. It is necessary to systematically design an art course teaching from three dimensions: theoretical framework, practical path, and technical support. The following suggestions are proposed:

CRT Reshapes Teachers' Artistic Education Concepts and Enhances Teaching Skills

Firstly, it is necessary to fundamentally change teachers' understanding of art education, shifting from skill-oriented to student-oriented, and encouraging them to pay more attention to the daily lives and local culture of rural students. Culturally responsive teaching has a student-centered nature. As the teacher who participated in the interview, identified as T5, is

an art educator at a normal university and a local artist, he criticized the skill-oriented teaching methods in art education. He pointed out that students' artwork reflects their inner thoughts, namely their understanding of the surrounding world and their attempts to create meaning through visual language. Another teacher, identified as T8, also suggested that "art teachers should reflect on their teaching practices and avoid excessive adult intervention. They also need to design new teaching methods that take into account students' characteristics to promote faster and better acceptance of deep cultural connotations. The CRT teaching method provides opportunities for art teachers to meaningfully connect students' family and school experiences, affirming their identity. Teachers should also actively use current intelligent tools to assist teaching and improve teaching quality, which provides a replicable paradigm for college art teachers and echoes the core concept of contemporary art education of "humanities leading the future, technology empowering art".

Regional Cultural Construction - Database and Curriculum Practice

To promote the practice of culturally responsive teaching in college art education, it is necessary to build a systematic and open curriculum resource platform. It is recommended to carry out the following aspects. Firstly, integrate regional cultural resources and build a digital database. Teachers can collaborate with local cultural centers, intangible cultural heritage inheritors, and university research teams to systematically organize and digitize local artistic heritage (such as traditional crafts, folk patterns, historical buildings, etc.) and establish a clear and easily searchable database. At the same time, we actively utilize technologies such as 3D modeling and virtual reality to recreate cultural scenes, develop an "online cultural workshop" module, and support remote experience and creative transformation for teachers and students. Encourage teachers to upload self-developed cases, establish a peer review mechanism and case update standards, and form a sustainable and optimized resource-sharing ecosystem. Actively support the system and promote the platform's implementation and application, such as setting up a "cultural resource transformation workshop" to guide teachers in extracting materials from databases and designing courses, and strengthen interdisciplinary course design capabilities. And it is suggested that the education department incorporate the use of the platform into the teaching evaluation system, establish special funds to support regional university cooperation and development, and avoid resource duplication.

From the perspective of classroom practical teaching, the construction of a practical teaching mode is a key link in realizing the culturally responsive teaching concept. To effectively integrate culture-responsive teaching, teachers have made various attempts and explorations. A common practice mode is to combine regional cultural characteristics to carry out teaching. Many art teachers in universities delve into local cultural resources and integrate folk art, traditional crafts, and local characteristic elements into their curriculum design. For example, in painting courses, teachers guide students to learn and draw on local traditional painting techniques, and use these techniques to create artworks with rich regional characteristics. Another practical mode is to enrich the cultural connotation of art teaching through interdisciplinary cooperation. Art teachers work together with other subject teachers to design comprehensive courses that combine art with multiple fields such as literature, history, philosophy, etc. In this mode, students can not only improve their art skills but also broaden their cultural horizons and cultivate multidimensional thinking abilities. For example, in courses that combine art and history, students gain a deeper understanding of the relationship between history and culture by studying art styles and representative works from different historical periods. Teachers use VR, AR, and other technologies to create immersive cultural experiences for students, such as virtual tours of art museums and galleries, and viewing artworks. This stimulates students' interest and enhances their ability to appreciate art and understand culture. College art teachers have explored diverse practical teaching methods such as workshops and field visits, and constructed a rich, culturally responsive teaching system to help students fully understand multiculturalism.

Establish A Process-oriented Cultural Feedback and Evaluation Mechanism

To break through the evaluation inertia of "emphasizing techniques over culture" in traditional art education, it is necessary to construct a dynamic and multi-dimensional process-oriented cultural evaluation system. The cultural dimension of the evaluation system breaks through the traditional technique scoring standards (Nish, 2024), such as adding indicators such as "cultural interpretation depth" and "cross-media innovation". Specifically, as follows:

Firstly, design evaluation tools are guided by cultural reflection.

Staged tracking: Decompose the development of cultural literacy into three stages: cultural perception, critical reflection, and innovative transformation, and develop supporting evaluation tools. For example, in the early stages of the course, the "Cultural Identity Self Presentation Scale" is used to assess students' cultural cognitive foundation. In the middle stage, the "Cultural Reflection Log" is used to record the value conflicts and the reconciliation process in creation. In the end, the "Cross-Cultural Work Interpretation Report" is used to assess the depth of cultural transformation.

Multi-stakeholder participation: Introduce teacher evaluation, peer evaluation, student self-evaluation, and external cultural expert comments to form a multi-perspective feedback mechanism, especially focusing on students' expression of their cultural stance changes (such as "how to view the reconstruction of traditional patterns in modern design").

Secondly, establish cultural sensitivity evaluation indicators.

Refine evaluation dimensions: Develop a grading scale (such as 1-5 levels) from three dimensions: "cultural relevance," "critical dialogue," and "innovation integration." For example, "whether the interaction between local culture and global culture can be dialectically presented in the work," or "discussing the differences in composition, color, and metaphor of different patterns. Teachers introduce the boundary issue between" cultural appropriation "and" cultural respect "(such as how to avoid superficial replication of symbols) as the core observation point.

Embedded course practice: Set up a "cultural proposal sketch iteration finished product interpretation" section in the creative task, provide targeted feedback in stages, and avoid the lag of summative evaluation.

Thirdly, strengthen the teaching improvement function of evaluation results.

Dynamic adjustment of teaching: Identify teaching blind spots based on evaluation data (such as students commonly having the problem of "symbolic appropriation of cultural elements"), and promptly supplement case analysis or cultural theory discussions.

Digital support: Build a "Cultural Growth Archive" platform to visualize the development

trajectory of students' cultural literacy and support teachers and students to jointly develop personalized improvement paths.

Guarantee measures: Conduct training on teachers' cultural evaluation abilities, with a focus on enhancing their ability to interpret cultural reflection texts and design gauges; Promote universities to incorporate cultural evaluation into their teaching assessment system and establish incentive mechanisms such as the "Cultural Innovation and Transformation Award". This mechanism can promote culturally responsive teaching to shift from "formal integration" to "deep internalization" and help students build a creative concept that combines cultural consciousness and artistic tension.

In summary, the core of culture responsive teaching is "using student culture as teaching resources" (Ladson Billings, 1995), which is achieved through the specific carrier of patterns in this example; Cross cultural practice in art creation needs to balance "traditional inheritance" and "contemporary criticism", avoiding falling into Orientalism or Western centrism, or only technical theory.

Results and Discussion

Through in-depth exploration of the attitudes and practices of teachers in cultural responsive teaching of art creation courses in universities, this study has obtained rich research results. The following is a detailed summary of these results, which not only reveal the current situation, but also point out the direction for future improvement.

Research has found that art teachers in universities have differences in their understanding of culture-responsive teaching. Some teachers have expressed a strong interest and positive attitude towards this teaching model, believing that by integrating students' cultural backgrounds, it can more effectively stimulate their innovative thinking and artistic creativity. However, there is also another group of teachers who exhibit a conservative or neutral attitude.

At the practical level, this study observed some noteworthy issues. Although many teachers attempt to introduce the concept of culturally responsive teaching in art creation classes, their

teaching strategies often appear singular and lack sufficient flexibility and diversity. For example, some teachers may simply add some cultural elements to the teaching process without truly integrating these elements with the course content and student needs. In addition, we have also found that some teachers neglect individual differences among students in practice, failing to fully consider each student's unique cultural background and learning needs. Furthermore, through in-depth analysis of various factors that influence teachers' attitudes and practices, research has found that cultural, educational, and personal factors directly or indirectly affect their understanding and implementation ability of culture-responsive teaching.

This study confirms that CRT significantly improves student engagement and educational outcomes in artistic creation. A key finding observed in multiple studies is that when applying CRT strategies, incorporating students' cultural origins as a core component of the curriculum can enhance the relevance and engagement of the learning process, ensuring that learning is meaningful and applicable to real-world environments. Another important finding is the positive impact of CRT on narrowing the achievement gap. The CRT strategy in art creation courses can help improve students' motivation and academic performance. CRT ensures that all students achieve their goals by ensuring equal educational opportunities. In addition, by recognizing and appreciating students' cultural diversity, CRT helps promote greater participation and equity in the educational process.

Conclusion

In summary, in college art creation classes, the attitude of teachers is crucial for the effectiveness of culture-responsive teaching. Positive teachers will understand students' cultural backgrounds, integrate diverse cultural elements, and stimulate learning interest and creativity. The attitudes and strategic choices of college art teachers in culture-responsive teaching are complex and diverse, influenced by personal educational philosophy, abilities, cultural background, school policies, resources, and student needs.

This study emphasizes the importance of implementing CRT to improve educational performance. CRT makes learning more relevant, meets students' different needs, and empowers learners, effectively promoting their learning. However, to achieve the expected results, it is crucial to have appropriate institutional support, policies that promote the

development of culturally responsive materials, and sufficient professional development funding. To effectively implement these practices in universities, educators are urged to start implementing culturally appropriate teaching strategies in the classroom.

The results of this important research may help art educators implement beneficial and relevant art projects and inspire further research on the complex and multifaceted phenomena that promote local culture in the context of urbanization. In the practice of art education, local culture will ensure that the younger generation can have life-changing artistic experiences. This will promote their development in a world full of challenges and changes.

Future research should expand the sample size, explore more diverse evaluation tools, and focus on the integration and innovation of culturally responsive teaching with other teaching models, as well as the application of modern technological means, to promote the in-depth development of culturally responsive teaching in college art education. Further research can explore how to strengthen art creation classrooms as a platform that not only allows students to come into contact with various artworks from other ethnic groups, but also promotes diversity through various art creation activities. More importantly, to strengthen unity in a diverse society, artistic creation activities can be expanded beyond classroom settings.

This article suggests stimulating teachers' cultural transformation ability through systematic support mechanisms, and future research can be expanded to compare differentiated practice models in different regional universities, while paying attention to the impact of culturally responsive teaching on students' long-term artistic development. Through tracking surveys and comparative analysis, the long-term impact of culture-responsive teaching on students' artistic literacy, cross-cultural communication skills, and innovative spirit can be evaluated, thereby verifying the effectiveness and sustainability of this teaching strategy.

References

Abacioglu, C. S., Volman, M., & Fischer, A. H. (2020). Teachers' multicultural attitudes and perspective-taking abilities as factors in culturally responsive teaching. The British journal of educational psychology, 90(3), 736–752. https://doi.org/10.1111/bjep.12328

Albert Bandura. (1977). Self-efficacy: Toward a Unifying Theory of Behavioral Change.

Psychological Review 1977, Vol. 84, No. 2, 191-215.https://educational-innovation.sydney.edu.au/news/pdfs/Bandura%201977.pdf

Belford, Nish & Crawford, Renée. (2024). Culturally responsive pedagogies and culturally responsive teaching: a reflexive discussion on initial teacher education within arts disciplines.

Bottiani, J.H., Larson, K. Debnam, K., Bischoff, C., & Bradshaw, C.P. (2017). Promoting educators'use of culturally responsive practices: A systematic review of in-service interventions. Journal of Teacher Education, 1–19. doi:10.1177/0022487117722553. https://files.eric.ed.gov/fulltext/ED586840.pdf

Ciddi, M. (2025). Analysis of Attitudes of Undergraduate Art Students Toward Painting Workshop Lessons . International Journal on Social and Education Sciences, 7(2), 195-204. https://doi.org/10.46328/ijonses.764

Desai, Dipti. (2020). Educating for Social Change Through Art: A Personal Reckoning. Studies in Art Education. 61. 10-23. 10.1080/00393541.2019.1699366.

Geneva Gay. (2010). Culturally Responsive Teaching: Theory, Practice, & Research. Teachers College Press; 2nd edition.

James A. Banks. （2006）.Race, Culture and Education_ The selected works of James A. Banks. Publisher : Routledge; 1st edition (April 20, 2006). https://book.douban.com/subject/2647198/

Krasnoff, B. (2016). Culturally responsive teaching: A guide to evidence-based practices for teaching all students equitably. Portland, OR: Education Northwest.

Luo, Ning & Guan, Tao. (2022). Exploring the Benefits of Culturally Responsive Art Learning Experience for Rural Chinese Students. International Journal of Art & Design Education. 42. 10.1111/jade.12444.

Max Horkheimer; Theodor W. Adorno. (1988). FISCHER Taschenbuch; 26. edition. https://symboleigenschoepfung.wordpress.com/wp-content/uploads/2014/01/adorno-horkheimer-dialektik-d-aufklaerung.pdf

Tajma Cameron, Valdijah Ambrose Brown, Jen Katz-Buonincontro, Ross C. Anderson, Allan Edmunds, Jessica Land, Mari Livie. (2024). "Mirrors and windows:" a case study of educators' culturally responsive teaching aspirations and syllabi transformation in the arts. Teaching and Teacher Education, Volume 148. https://doi.org/10.1016/j.tate.2024.104714.

Tekin, A. (2025). Examining High School Students' Attitudes towards Contemporary and

Digital Art and Virtual Exhibitions. International Journal on Studies in Education, 7(4), 879-898. https://doi.org/10.46328/ijonse.5561

Vygotsky, L. S. (1977). The Development of Higher Psychological Functions. Soviet Psychology, 15(3), 60–73. https://doi.org/10.2753/RPO1061-0405150360

Yingai Li. (2024). Exploring the Difference in Art Education between China and Western Countries through a Lens of the Attitudes towards Street Art. International Journal of Social Science and Humanity. doi: 10.18178/ijssh.2024.14.6.1229.

Author Information

Dr. Wang Xi

https://orcid.org/0009-0009-7121-8983

Universiti Teknologi MARA

Collegel of Creative Art in Universiti Teknologi MARA, 40000, Selangor, Malaysia

Contact e-mail: *cissiewang123*@gmail.*com*

Associate Professor. Du Hai Tao

https://orcid.org/0009-0006-6010-1964

Qufu Normal University

Academy of Fine Arts of Qufu Normal University, 276800, Shandong, China *m*

Citation

Xi, W. & Tao, D. H. (2025). Attitudes and Practices of College Art Teachers towards Culturally Responsive Teaching in Art Creation Courses. In M. Koc & O. T. Ozturk (Eds.), *Studies on Social and Education Sciences 2025* (pp. 1-20). ISTES.

Chapter 2 - International Research on College Students' Perceptions regarding the Impact of the Lasallian Mission on Their Development

Dr. Hwa Seong Oh

Chapter Highlights

- Despite the importance of the influence of the Lasallian mission in its educational ministry and the growing number of Lasallian institutions of higher education, empirically supported data from international research on the impact of the Lasallian mission on college students' development is absent.
- To examine the perceptions of the mission impact on students' holistic development in Lasallian institutions of higher education across the Lasallian Regions, this study utilized the methodology of survey research. The survey instrument, the Lasallian Mission Impact Inventory, was developed, and an internet survey was conducted in three different languages (English, Spanish, and French) with students at six Lasallian colleges in six different countries.
- Findings of the data analysis include: (1) the relationship between Lasallian Mission Understanding and Lasallian Mission Value; (2) the relationship between Lasallian Mission Value and Lasallian Mission Impact; and (3) the relationships among Previous Lasallian Education Experience, Lasallian Mission Value and Lasallian Mission Impact.
- The findings first show that Lasallian Mission Understanding is significantly and positively associated with Lasallian Mission Value at all six institutions. Second, Lasallian Mission Value is positively associated with all four types of Lasallian Mission Impact—Academic Impact, Spiritual Impact, Social Impact, and Career Impact at all institutions. Third, Lasallian Mission Value is not related to having Previous Lasallian Education Experience in any statistically significant way. Also, all four types of Lasallian Mission Impact are not related to Previous Lasallian Education Experience in general.

Introduction

The mission of an institution is the foundation of its work (Daniels & Gustafson, 2016). Faith-based higher education is no exception. The school's mission should also be the barometer for measuring educational outcomes (Ferrari & Cowman, 2004). Simply put, every school should ask itself, "What is the impact of our mission on our educational outcomes?" The answer to this question is of significant importance to any faith-based educational institution's daily operations, and it can play a pivotal role in improving mission formation and integration.

Faith-based educational institutions are numerous in the globe. One such order is the Institute of the Brothers of the Christian Schools, an organization Saint John Baptist de La Salle founded in 17th century France (Lasallian District of San Francisco New Orleans, n.d.). As of February 2016, there were 976 Lasallian schools in 77 countries (Brothers of the Christian Schools, 2016), with 4,000 Brothers, 595 priests and other religious, and 89,716 other Lasallian lay partners (40,037 men and 49,679 women) serving 961,521 students. These are the schools and people following in the footsteps of Saint De La Salle and his first Brothers, and charged with carrying out the Lasallian mission in various educational ministries (Brothers of the Christian Schools, 2016).

The Institute of the Brothers of the Christian Schools has been serving the young through its educational ministry for over 300 years. According to Franz (2006), the Institute focused on primary and secondary education for the first two centuries of its existence. Then, over the last century of its existence, the number of Lasallian institutions of higher education internationally has grown substantially (Franz, 2006). This worldwide phenomenon towards increase in higher education has been unprecedented in the history of Lasallian education and is understood as a "sign of the times" (Rodríguez Echeverría, 2018, p. 107).

The former Superior General of the Brothers of the Christian Schools, Brother Robert Schieler invites Lasallian educators to reflect on the impact of Lasallian institutions of higher education (Schieler, 2018). Globally, approximately 200,000 students are served in Lasallian colleges and universities, comprising one-fifth of the total Lasallian student population. In his reflections, Schieler (2018) emphasizes the Catholic and Lasallian identity of community,

research collaboration, and the importance of global networking.

According to Brother Gustavo Ramirez Barba (2018), the former General Councilor for Lasallian Higher Education in Rome, 65 Lasallian colleges and universities have joined the International Association of Lasallian Universities (IALU). IALU has existed for 20 years since 1998. The locations of these 65 Lasallian institutions of higher education are as follows: Central and South America (19), Mexico (16), Asia and Pacific Islands (11), Europe and French-speaking Africa (10), and North America, Bethlehem and English-speaking Africa (9).

There are five Regions in the Institute of the Brothers of the Christian Schools: (1) PARC (Pacific-Asia Regional Conference: Asia and Oceania); (2) RELAF (Région Lasallienne Afrique-Madagascar: Africa); (3) RELEM (Région Lasallienne Europe-Méditerranée: Europe – Mediterranean); (4) RELAL (Région Latinoamericana Lasallista: Latin America), and (5) RELAN (Région Lasallienne de L'Amérique du Nord: North America) (LaSalle.org, n.d.). The Lasallian Region of North America (RELAN) includes seven Lasallian institutions of higher education—six Lasallian colleges and universities in the United States, and Bethlehem University in Palestine, which is the first Catholic university in the Holy Land (Christian Brothers Conference, 2019). Bethlehem University and its Christian Brothers Community are in the Lasallian Region of North America (RELAN) because they are sponsored through this region (LaSalle.org, n.d.).

The Lasallian mission, as defined by the Brothers of the Christian Schools (2002), is "to provide human and Christian education to the young, especially the poor" (Article 3). The mission is manifested in five Lasallian Core Principles: (1) Faith in the Presence of God; (2) Respect for All Persons; (3) Inclusive Community; (4) Quality Education; and (5) Concern for the Poor and Social Justice (Living Lasallian, 2016, March).

There have been substantial efforts and research in developing mission assessments among faith-based institutions. The Association of Catholic Colleges and Universities (2018) published Institutional principles for Catholic identity and mission assessment: A best practices guide as a part of the Catholic Identity Mission Assessment (CIMA) project. The Association of Jesuit Colleges & Universities (AJCU) published Some characteristics of Jesuit colleges and universities: A self-evaluation instrument. The International Council for

Association and Lasallian Educational Mission (CIAMEL) (2018) also issued a draft of Lasallian identity and vitality criteria. Despite the importance of this Lasallian mission in the daily operations of Lasallian institutions and its potential impact on every student's development, there is a lack of empirically supported data on students' perceptions of understanding, value, and impact of the Lasallian mission. Thus, there is little data-driven evidence of how mission impacts students' holistic development, including academic development, spiritual development, social development and career development, in terms of personal transformation, choices and actions.

Moreover, research on the impact of the Lasallian mission on college students' development is very rare. Some scholars have developed ways to measure institutional mission and values perception. In 2004, Ferrari and Cowman developed the DePaul Values Inventory, and tested its reliability and validity. Utilizing the instrument, Ferrari, Kapoor, and Cowman (2005) conducted research on college students' perceptions of their university's mission and values. Later, Ferrari, Cowman, Milner, Gutierrez, and Drake (2009) examined another study on the perceptions of faculty and staff. However, the perceptions of college students regarding the institutional mission impact on their development have not been measured. And the Lasallian mission impact on college student development has not been explored, in spite of the unprecedented global growth of Lasallian institutions of higher education and its immense potential future impact. Given the growing number of Lasallian institutions of higher education (Franz, 2006; Rodríguez Echeverría, 2018), this lack of research on the mission impact on college students' development is concerning.

Furthermore, international research that compares the impact of the Lasallian mission on college students' development across regions is absent. Lasallian educators have shown a strong commitment to students worldwide, and research findings conducted in the United States may be different than findings elsewhere (Choi & Rhee, 2014). Despite a pressing need for comparative studies in our globalized society, international research focusing on college students' perceptions of the mission impact on their development is non-existent. This study seeks to fill that void. It explored the perceptions of college students concerning the impact of the Lasallian mission on their holistic development. And students from six Lasallian institutions of higher education located in six different countries participated in the study.

Purpose of the Research

The purpose of this study was to examine and understand the perceptions of the Lasallian mission impact on student development in Lasallian colleges and universities located in the five Lasallian Regions. A deeper understanding of how the Lasallian mission affects Lasallian college students through empirically supported data will be useful for Lasallian educators and their institutions. Moreover, understanding the Lasallian mission impact on the students through the data collected from different Lasallian schools in the different Lasallian Regions (LaSalle.org, n.d.) can benefit the worldwide Lasallian Institute, because data that suggest the type and degree of impact and compare impact across regions can be tremendously helpful in developing and sustaining mission-integration programs.

Research Questions

This study aimed to investigate how students, who are attending Lasallian colleges and universities in six different countries, perceive the impact of the Lasallian mission on their holistic development. To guide the inquiry of the study, three research questions were proposed:

1. What is the relationship between Lasallian Mission Understanding and Lasallian Mission Value?

a) To what extent do the students at Lasallian institutions of higher education perceive that they understand the Lasallian mission?

b) To what extent do the students at Lasallian institutions of higher education perceive that the Lasallian mission is of personal value to them?

c) Is there a correlation between Lasallian Mission Understanding and Lasallian Mission Value?

2. What is the relationship between Lasallian Mission Value and Lasallian Mission Impact?

a) To what extent do the students at Lasallian institutions of higher education perceive that the Lasallian mission impacts their academic, spiritual, social and/or career development?

b) Are there correlations between Lasallian Mission Value and the four types of Lasallian Mission Impact (Academic Impact, Spiritual Impact, Social Impact and Career Impact)?

c) If so, which type of Lasallian Mission Impact has the strongest correlation?

3. What are the relationships between Lasallian Mission Value, Previous Lasallian Education Experience, and Lasallian Mission Impact?

a) What is the relationship between Lasallian Mission Value and having Previous Lasallian Education Experience?

b) What is the relationship between each Lasallian Mission Impact (Academic Impact, Spiritual Impact, Social Impact, and Career Impact) and Previous Lasallian Education Experience, when controlling for Lasallian Mission Value?

Theoretical and Conceptual Framework

To explore student perceptions of the Lasallian mission impact on holistic student development in Lasallian colleges and universities located throughout the world, a metatheory of spiritual formation (Welch & Koth, 2013) provided the theoretical framework for the research design. Given the importance of the Lasallian mission in this research, Lasallian spirituality provided the conceptual framework for the study.

Metatheory of Spiritual Formation

Welch and Koth's (2013) metatheory of spiritual formation has been established in order to understand college students' development, especially spiritual development in relation to their service-learning experience. According to the authors (2013), this hybrid metatheory is based on developmental psychology, such as Liebert's personality development and Fowler's faith development. Also, Delve, Mintz, and Stewart's values development or "psychological and personal development within service learning" (Welch & Koth, 2013, p. 618) is incorporated.

According to Welch and Koth (2013), the spiritual formation process has six relational spaces. The term "space" suggests non-linear mobility in opposition to the term "phase," which implies more linear mobility, since spiritual formation is an ongoing process with repetitive movement forward and backward. Those six spaces are: Unknown, Encounter, Authentication, Radicalization, Integration, and Practice.

The first developmental space, "Unknown" is where an individual is not aware or unsure of

one's "identity, values, or purpose" (Welch & Koth, 2013, p. 620). Regarding college student development, many college students arrive at their college campus without a clear understanding of who they are and start exploring "their sense of self" (p. 620) as they become independent.

The second space, "Encounter" is where the self is suddenly exposed to "the other" and becomes aware of it. For college students, this happens frequently, sometimes in the form of the "mundane experience" that comes from living with a roommate and sometimes in the form of the "profound awakening to new ideas" (Welch & Koth, 2013, p. 620) that can occur through interaction with faculty and classmates.

The third space, "Authentication," is where an individual makes sense of encounters by "relating prior knowledge and experience" (Welch & Koth, 2013, p. 621). Through the encounter experience and reflections on it, college students start to discover "others in the world with other experiences" and realize that they are not "the center of the universe" (p. 621). In the space of "Authentication," students learn about the conflict between others' interests and their own and consider how to resolve them.

The fourth space, "Radicalization" is where changes happen, and an individual embraces a new identity or a new way of living. For college students, this occurs when they "adopt a new identity in terms of their political affiliations, sexuality, lifestyle (such as vegetarianism), and religious or spiritual foundations" (Welch & Koth, 2013, p. 621). According to the authors (2013), it can be a "peak experience" for the students.

In the fifth space, "Integration," an individual "adopts an aspect of the other by sacrificing some aspects of individuality" (Welch & Koth, 2013, p. 622). An example of this provided by the authors (2013) is an individual college student athlete becoming part of a team. Here, students find their community and put others' interests before their own.

The sixth space, "Practice" is where an individual intentionally maintains what has happened in the process. Welch and Koth (2013) point out that the term "practice" is frequently employed in the professional world, implying the "sense of vocation: what one is called to be and to do for a purpose" (p. 622).

Considering students' Lasallian mission experience as a spiritual formation, this study attempted to relate the first space (Unknown) to the variable of Lasallian Mission Understanding, and the second space (Encounter) to the variable of Lasallian Mission Value. Regarding the Lasallian Mission Impact on college students' development, this study also attempted to relate the third space (Authentication) to the variable of Academic Impact, the fourth space (Radicalization) to the variable of Spiritual Impact, the fifth space (Integration) to the variable of Social Impact, and the sixth space (Practice) to the variable of Career Impact. Overall, Welch and Koth (2013) refer to the process of spiritual formation as a "journey" (p. 619). Students' perceptions of understanding, value, and impact of the Lasallian mission on their development may reflect their Lasallian journey and growth.

Lasallian Spirituality

When, in 1680 in Rheims, France, Saint John Baptist de La Salle founded the Institute of the Brothers of the Christian Schools (Christian Brothers or "Brothers"), he did so to respond to a critical need of his time by providing educational services to the children of artisans and the poor. Rummary (1987) used the concept of the "double contemplation" to summarize what De La Salle accomplished. According to Rummary, De La Salle, who was a priest and canon, saw the large theological gap between the "God who wants all saved" and the "children of artisans and the poor who [were] far from salvation." This double contemplation on God and children guided De La Salle "from one commitment to another." Finally, he established schools and trained teachers, and ran the schools "together and by association," because he wanted salvation to be accessible to all (Rummary, 1987, p. 1).

According to Botana (2008), "spirituality is a way of living a particular 'spirit' and to express it" (p. 64), and Lasallian spirituality is one method by which Lasallian educators can "be" and live out the Lasallian mission. More specifically, Lasallian spirituality is a spirituality that defines both who Lasallians are (people in a relationship with God) and what Lasallians do (educate others).

The rule of the Brothers of the Christian Schools (Brothers of the Christian Schools, 2002) clearly sets forth the Lasallian mission: "to provide a human and Christian education to the young, especially the poor, according to the ministry which the church has entrusted to it"

(Article 3). And the first spirit of the Institute is "a spirit of faith which leads the Brothers to look upon everything with the eyes of faith" (Article 5). This spirit of faith "kindles in the Brothers an ardent zeal for those confided to their care in order to open their hearts to receive the salvation revealed in Jesus Christ" (Article 7). Additionally, since the beginning of the Institute, "the Brothers have fulfilled their mission together and by association" (Article 6).

According to Rummary (2012), from the very beginning of the Institute the essential characteristics of Lasallian spirituality consisted of three "spirits": community, faith, and zeal. Also, Lasallian spirituality is "a practical spirituality" (Rummary, 2012, p. 3) since it is an integrated spirituality. There is a convergence of spiritual principles and educational directives. Lasallian spirituality brings the Gospel values into the world of education. It is through this lens of the Lasallian spirituality that the impact of the Lasallian mission on college student development was examined.

Literature Review

To measure the impact of the Lasallian mission, which is rooted in Lasallian spirituality, it is important to understand the history of the development of Lasallian higher education. Because the institutional mission plays an important role in faith-based colleges and universities, many scholars and researchers have attempted to measure the concept of institutional mission. Also, college student development in Lasallian education must be taken into consideration. Therefore, three main topical sections are identified through this literature review: (1) the historical background of Lasallian higher education; (2) institutional mission; and (3) college student development in Lasallian education.

Historical Background of Lasallian Higher Education

Lasallian education is undeniably a part of Catholic education. Therefore, an overview of the historical background of Catholic education should precede an overview of the historical background of Lasallian education. Considering the scope of this study, Catholic education in the United States (U.S.) can be the proper spatiotemporal entry point of this literature review.

Historical Background of American Catholic Education

Catholic education in America began with the efforts of missionaries from Spain, France, and England in the mid-16th century to convert Native Americans (Walch, 2003). The first formal Catholic parish school in the United States, St. Mary's School, was established by Philadelphia Catholics in 1783. According to Walch (2003), that school was the beginning of one of the most significant social movements in American history—a movement that led to educating tens of millions of citizens without direct public financial aid, over the next two centuries.

The arrival of Catholic immigrants in the United States in the 19th century resulted in the formation of an extensive Catholic education system and a corresponding urgent need for teachers, which was mostly met by sister-teachers. Walch (2003) stated that no other group made a bigger sacrifice for Catholic parochial education than "women religious" (p. 134). By 1900, more than 40,000 sisters worked in the U.S. dioceses and most of them worked in parish classrooms almost for free. The 119 communities of women religious sent thousands of their sisters to the U.S. parish schools, including Elizabeth Seton's Sisters of Charity, the School Sisters of Notre Dame, the Sisters of Charity of the Blessed Virgin Mary, the School Sisters of St. Francis, and the Felician Sisters (Walch, 2003).

Walch (2003) identified several themes of historical characteristics of Catholic parish schools in the United States, and they are: community, immigration, survival, adaptability, identity and the variety of responses to the parish school movement. According to Caruso (2012), the sisters' legacy corresponds to each of those characteristics:

> …the sisters were on the forefront of the Catholic community; many were the daughters of immigrants or were generous missionaries who emigrated to the United States to help
> their people; the sacrifices that women religious made substantiated the survival of the schools; the sisters were creative in adapting schools to the times; and the presence of sisters in a school confirmed its strong Catholic identity. (Caruso, 2012, p. 9)

Through the sisters' unparalleled sacrifice, the identity of American Catholic education has survived.

In the *Report of the U.S. Commissioner of Education for 1903*, the federal government officially noticed Catholic education—the second largest school system in the nation—for the first time. By 1965, at its high point, more than 4.5 million children were educated in Catholic parish elementary schools, covering 12 percent of children enrolled in school in the United States (Walch, 2003).

American Catholic schools grew from and survived tremendous hardships, and serve some of the most underserved populations in the United States, and they will continue their unique history. The history of Catholic higher education needs to be understood and contextualized as an extension of the permanently changing and always-serving history of American Catholic education.

Historical Background of Lasallian Education

According to Goussin (2003), the "foundation date for the Institute" is June 24, 1682 (p. 15) when De La Salle and the first Brothers started to live in the Mother-House, rue Neuve. De La Salle responded to the needs of his given time, and he summarized his and his first Brothers' work in his *Meditation for the Time of Retreat* as follows:

> … by establishment of the Christian schools, where the teaching is offered free of charge and entirely for the glory of God, where the children are kept all day, learn to read, to write and to know their religion, and are always kept busy, so that when their parents want them to go to work they are prepared for employment. (MTR 194.1) (Christian Brothers Conference, 1994, p. 435)

When De La Salle died on Good Friday morning, April 1719, at the age of 68, there was a small community of some hundred men, who are today called the Brothers of the Christian Schools. And yet at the time of De La Salle's death, they were not officially recognized either by church or state (Brothers of the Christian Schools District of San Francisco, 2009). Today, there are approximately 1,000 Lasallian institutions in about 80 countries, serving nearly one million students and following in the footsteps of De La Salle and his first Brothers (Brothers of the Christian Schools, 2016).

Tidd (2009a, b) examines the historical background of Lasallian education, focusing on the

way the Christian Brothers have responded to sustaining the original charism of the founder, Saint John Baptist de La Salle, given the lack of vocations—new Brothers—in the Institute. Tidd draws historical and conceptual overviews regarding the laity in Lasallian schools from 1719 to 1986, and from 1986 to 2000, as a two-part series. The changes of the concept "association," reached the "Association of Christian Teachers" in the 38th General Chapter (1946). The creation of the concept "Lasallian Family" in the 40th General Chapter (1976), and "shared mission" in the 41st General Chapter (1986), followed.

Tidd (2009b) discussed the conceptual paradigm of shared mission from 1986 to 2000. The call for a new concept of shared mission and formation of a Lasallian family was well received by Brothers in the United States. The Buttimer Institute of Lasallian Studies was one of the most effective formation programs initiated in response to the call. Named after the first American Superior General, Brother Charles Henry Buttimer, the Buttimer Institute has provided Lasallian educators from all over the world with an intensive formation program covering the "life, work and spirituality of Saint John Baptist de La Salle and the origins of the Lasallian educational mission" (LaSalle RELAN, 2019).

Later, the Christian Brothers United States/Toronto Region (RELAN) produced a document, entitled "Shared Mission," to respond to the needs of North American districts in 1995. Finally, the "reconceptualization and reform of the Brothers' identity and mission" (Tidd, 2009b, p. 452) became clear and solid through the 43rd General Chapter (2000).

According to Tidd (2009a), to meet the needs of the young and the poor in the present time, the Brothers of the Christian Schools had to create a new vision of "association" which required changes to the Institute's definitions of membership, purpose, structure, and relationship to the Lasallian mission today. Therefore, lay partners share this Lasallian mission in partnership through "association."

Historical Background of Lasallian Higher Education

As Brother Gustavo Ramírez Barba (2018) writes, higher education in the Institute arrived with Saint John Baptist de La Salle and his concern for teacher formation. The Founder's attention to the "seminaries" for rural schoolmasters and his establishment of the "school of

Saint Yon" (Ramírez Barba, 2018, p. 65) is the birth of higher education in the Institute, dating back to the end of the 17th century.

Some educational institutions in the Lasallian Institute in the 18th century, called Pensionnats, are similar to contemporary technical schools or polytechnic universities. Some evening classes for adult workers and trade and technical schools in the 19th century served as the precursors of modern Lasallian institutions of higher education, such as Manhattan College in New York (USA, 1853) and the Agricultural Institute of Beauvais (France, 1854) in the 1850s. Saint Luc Art Schools in Brussels (Belgium, 1863), La Salle University of Philadelphia (USA, 1863), Saint Mary's College of California (USA, 1863), and Christian Brothers College in Memphis (USA, 1871) followed in the 19th century (Ramírez Barba, 2018).

At the beginning of the 20th century, establishment of many Lasallian institutions of higher education continued in France, Spain, and the United States. Saint Mary's University in Winona (USA, 1912) and Lewis University in Romeoville (USA, 1932) opened in the first few decades of the 20th century. In 1911, De La Salle University in Manila (Philippines), the first Lasallian institution of higher education in the Asian Pacific Region, was founded. In 1957, the La Salle Foundation for Natural Science was established in Venezuela. In the 1960s, Universidad La Salle in Mexico City (Mexico, 1962), De La Salle University in Bogotá (Colombia, 1964), and De La Salle University Bajío in Leon (Mexico, 1968) were established (Ramírez Barba, 2018).

In 1973, Bethlehem University (Palestine) was established as a result of Pope Paul VI's Holy Land visit in 1964. In the 1980s and 1990s, many Lasallian institutions of higher education were founded in Latin America and the Philippines. Also, in the 1990s, Lasallian higher education in Africa started burgeoning. In 1991, the African Lasallian Center of Abidjan (Ivory Coast) began. In 1996, in connection with Tangaza College in Nairobi (Kenya), Christ the Teacher Institute for Education, sponsored by Saint Mary's University of Minnesota, was accredited (Ramírez Barba, 2018).

Since the 42nd General Chapter of the Brothers of the Christian Schools in 1993, the Institute has recognized the important role higher education can play in the Lasallian mission. The International Association of Lasallian Universities (IALU) was founded in 1998, and a

General Councilor representing Lasallian higher education was appointed in 2014. As of now, 65 Lasallian institutions of higher education have joined IALU as members (Ramírez Barba, 2018).

Institutional Mission

The mission shapes the daily operations of an institution (Daniels & Gustafson, 2016). Many researchers have focused on the role of the institutional mission in relation to specific programs. Daniels and Gustafson (2016) investigated what role faith-based higher education institutions play in contributing to and supporting the public good. The authors (2016) stated that "the central premise here is simply that the currently accredited faith-based institutions are all sponsored by religions in which their central authority call adherents to care for others and a commitment to social justice" (p. 3). A discussion of faith-based American higher education institutions and practical examples of programs that enhance the public good and serve diverse institutions (Grinnell College, Brandeis University, Gonzaga University, and Seattle Pacific University) were provided by Daniels and Gustafson (2016).

Moreover, Procario-Foley (2017) investigated how religious education at faith-based institutions informs their institutional mission. As the director of the combined Mission and Ministry Office at Iona College, the author provided "an experiential knowledge of its programs" (p. 268). According to the author, "a mission office needs to be inclusive of the voices from the margins that may not be reflected in the brand" (p. 271).

Procario-Foley (2017) claimed that school employees are integral to the future of the mission, offered an overview of educational programs, and analyzed some concerns in higher education. Three languages of teaching (homiletic, therapeutic, and academic), five disciplines of learning community (personal mastery, mental models, shared vision, team learning, and system thinking), and two scholarly approaches to education (narrative/transformative education and a shred/praxis model) were discussed. In addition, Lowery (2012) provided a new concept of "Catholic higher education as mission," utilizing the framework of Anthony J. Gittins and the theory of Karl Rahner.

Measurement of the Mission

Considering the significance of the institutional mission, some scholars have paid close attention to the importance of measuring the mission. According to Ferrari and Velcoff (2006), a need exists for institutions of higher education to develop effective instruments "to assess the perceptions and commitment by stakeholders (e.g., faculty and staff) to the school's mission" (pp. 245-246). This is because such mission statements are an institution's tools of "publicly proclaiming for critical assessment the institution's objectives, expectations, and values" (p. 243), and the survival of each institution is dependent "on financial and strategic leadership, as well as a consistent mission statement that distinguish[s] the institution from other schools, filling a unique niche within higher education" (pp. 244-245).

To measure institutional mission, Ferrari and Cowman (2004) developed an instrument, DePaul Values Inventory (DeVI), and conducted three studies with different student samples to investigate the reliability and validity of the instrument. According to Ferrari and Cowman (2004), the reliability and validity of the instrument was confirmed to measure "students' perceptions of an institution's mission and values" (p. 43). Later, Ferrari and Velcoff (2006) conducted quantitative research and investigated the "psychometric properties of a mission identity and activity measure," and confirmed the reliability of a new instrument, DePaul Mission and Values, through two full-time staff samples (sample 1, n=178; sample 2, n=361) from a "medium-sized, faith-based, urban Midwestern university" in the Chicago area. All participants took a self-report instrument which included two sections, institutional identity (urban, Catholic, Vincentian) and mission-driven activities. Sample 1 participants were recruited in winter 2003, and sample 2 participants were recruited in spring 2004 from among non-sample 1 participants. Through a confirmatory factor analysis, both samples produced the "same factor structure." The research sought to measure student perceptions of their school's institutional mission.

Lastly, some researchers noticed the importance of fostering students' spiritual development in the mission of Catholic higher education. Sterk Barrett (2016) pointed out that "[d]espite aiming to cultivate spiritual growth, there is evidence that Catholic colleges and universities have not been any more successful than other private higher education institutions or other religiously affiliated institutions in this regard" (p. 114). Sterk Barrett (2016) conducted a

mixed method research and advanced investigation of the relationship between spiritual development and service learning experience as the mission-integration program at a Catholic university first by testing the existence of the connection through survey, and second by analyzing changes in specific framework of service learning. The data were gathered from students who participated in the PULSE service learning program at Boston College. First, quantitative results confirmed significant, almost 80%, positive connections between spiritual development and service learning experience. Second, qualitative results revealed the big changes in spiritual dimensions regarding (1) interconnectedness of and service to humanity and (2) understanding oneself and one's purpose in life. This study provided justification for institutionalizing service learning at Catholic schools, especially in accordance with the mission.

Measurement of the Lasallian Mission

Based on the importance of the mission, many organizations attempt to develop effective assessments around the mission. The Association of Catholic Colleges and Universities (2018) undertook the Catholic Identity Mission Assessment (CIMA) project and published a best practices guide. The guide was designed to help Catholic colleges and universities understand the unique assessment domains for Catholic higher education. The following 10 domains were identified: "1. Catholic Mission and Identity; 2. Mission Integration; 3. Leadership and Governance; 4. Curriculum and courses; 5. Faculty and Scholarship; 6. Co-curricular Student Learning and Engagement; 7. Student Access, Support, and Success; 8. Service to the Church and the World; 9. Role and Importance of Staff; and 10. Institutional Practice in Management and Finance" (p. iv). Also, the Association developed the CIMA Student Survey assessment to measure "student perceptions of mission" (Association of Catholic Colleagues and Universities, 2018, p. iv). The CIMA Student Survey consists of nine modules: "Catholic Social Teaching; Catholic Intellectual Teaching; Leadership, Service, and Vocation; Climate for Non-Catholics; Catholic Moral Teaching; Religious Beliefs and Values; Religious Practice [and Faith Formation]; Demographic and Background Information; and Mission Integration" (p. 24).

The International Council for Association and Lasallian Educational Mission (CIAMEL) (2018) also developed a draft of *Lasallian identity and vitality criteria* (the Criteria)

according to a request from the 45th General Chapter. It is intended to support Lasallian institutions and help them develop a Lasallian identity among their constituencies and help those constituencies understand the Lasallian mission and what it means to be a part of the worldwide Lasallian network. The Criteria identified the significant characteristics of Lasallian education and organized them into these six categories: "A. Responding to real needs; B. Operating through educational communities; C: Accompanying students in their development; D. Being energized by our Lasallian tradition; E. Promoting the culture of quality education; and F. Implementing a strategic management process" (pp. 5-7).

These Criteria provide an effective tool to (1) analyze the current Lasallian educational practice and develop strategic plans accordingly; (2) identify the Lasallian criteria for educational action; (3) recognize the Lasallian identity development; (4) clarify the expectations for Lasallian educators to reach; and (5) reiterate the things that cannot be ignored in Lasallian institutions. This assessment is designed for the Lasallian educators and their institutions.

These assessments on Lasallian mission identified important areas of mission and provide valuable information from the perspectives of educators or institutions. It would be helpful to have information from student's perspectives to more effectively measure mission effectiveness.

College Student Development in Lasallian Education

According to Patton, Renn, Guido, and Quaye (2016), the term "college students" refers to individuals who are in postsecondary learning environments, such as those typically taking place in formal setting like colleges and universities. College students' learning experiences can also take place outside of the institutional environment, at places like work, service commitments, study abroad programs, or community living experiences. This study employs the same definition of "college students" and focuses on the undergraduate students who are enrolled in the Lasallian colleges and universities in the five Lasallian Regions. Development is defined as the "process of becoming increasingly complex" (Patton, Renn, Guido, and Quaye, 2016, p. 5), and this study approaches development from a holistic-development angle based on the goals of Catholic education and the principles of Lasallian education.

Also, Astin, Astin, Lindholm, Bryant, Calderone, and Szelenyl (2005), learned from a national survey on the spiritual life of college students what these students were expecting from their college experience. Findings indicated that college students expect their schools to prepare them with spiritual and emotional development, as well as with career and educational development. Regarding their expectations on their college experience, 94 percent of students chose "employment" preparation, and 81 percent chose "graduate or advanced education" preparation. Next, 69 percent of students expected their school to "enhance their self-understanding"; 67 percent of students expected their school to "develop their personal values"; 63 percent of students expected their school to "provide for their emotional development"; and 48 percent of students expected their school to "encourage their personal expression of spirituality" (Astin et al., 2005, p.6). Overall, students seem to expect holistic development from their college experience.

Holistic Student Development

As clearly stated in the National Standards (Ozar & Weitzel-O'Neill, 2012), Catholic education aims to educate the whole person. Such a holistic approach to students' development encompasses all aspects of human development, including their physical, intellectual, psychosocial, and spiritual development. According to Manning (2014), from Catholic elementary schools to high schools, "educating the whole person" (p. 77) is frequently found as the school's website slogan, since Jesus promised life to the full ("I have come so that they may have life and have it to the full," John 10:10) which goes beyond academic knowledge or technical skills. As a matter of course, Catholic higher education also shares this holistic educational view. The Association of Catholic Colleges and Universities (2018) emphasizes the developmental approach in student life in Catholic higher education, and clearly states that the focus should be on "'whole' student development" (p. 12).

Lasallian education is no exception. According to Brother Gustavo Ramírez Barba (2018), one of the Lasallian educational principles is holistic education. Quality education should provide students with "well-rounded growth" (Ramírez Barba, 2018, p. 70). Also, in the Declaration of the Brothers of the Christian Schools (1997), it is clearly stated that Lasallian education is "concerned with the whole person" (40.3, p. 29), respecting the individuality,

social situation, and personal vocation of each student. The International Council for Association and Lasallian Educational Mission (CIMAEL) (2018) developed a draft of the Lasallian identity and vitality criteria to measure Lasallians' commitment to education, and identified "offering a holistic approach" as an important criterion, emphasizing that "Lasallian education develops every dimension of the person" (p. 8). Additionally, Lasallian University institutions in Europe, in expressing their Lasallian identity, emphasize the student-centered educational style that is based on holistic dimensions of human existence (LaSalle Universities, n.d.).

Lasallian educational programs are meant to serve the "integral formation of each person and their relationship to others" (Shieler, 2018, p. 105). Lasallians' focus on intentional awareness of the presence of God is the center of its educational ministry from the Founder's time. And the undeniable dignity in each human person Lasallians appreciate based on the presence of God invites the Institute to the goal of the common good with an attitude of solidarity (Shieler, 2018). In 17th century France, a Catholic nation, the society did charity work but not solidarity. It gave the poor the help of religion but denied them the advantage of knowledge. De La Salle's life, through his gospel journey (Goussin, 2003), became an example of solidarity, guided by the Spirit and premised on the ultimate solidarity—the Incarnation.

De La Salle was born, raised, and educated in the religious principles of middle-class Rheimes, and was expected to be one of the great religious leaders of his time. Instead, he dedicated his life to establish an association of lay people for Christian education, bound himself to the association, and lived and "died as one of its members" (Goussin, 2003, p. iv). Especially today, globalization calls Lasallians' attention to solidarity to go beyond the walls of hatred and division (Rodríguez Echeverría, 2018). According to Rodríguez Echeverría (2018), Lasallian institutions of higher education should ask their members to contemplate if they act as change agents for a "sustainable, environmental, social, economic, political, cultural and religious development" (p. 115) to respond to the problems of their given time, as the Founder responded to the needs of his time by contemplating "the reality of the poor" and "the will of God in history" (Bolton, 2013, p. 305). This ability to respond to local needs of each time characterizes the Lasallian heritage, and it is the same principle applied from the opening of the Sunday academies in Paris in 1698 to the developing various forms of Lasallian institutions of higher education in the 19th and 20th centuries (Rummary, 2006).

Academic Development in Lasallian Education

Lasallian education emphasizes the importance of students' academic development. According to Mann (2018), one of the Lasallian educational characteristics is education grounded in teaching excellence and engaged learning. The International Council for Association and Lasallian Educational Mission (CIAMEL) (2018) identified "Promoting the culture of quality education" (p. 7) as one of the six Lasallian identity and vitality criteria. LaSalle universities (n.d.) in Europe also identify academic and scientific rigor as a characteristic of Lasallian higher education. And academic excellence in Lasallian schools goes beyond the narrowly defined course contents (Fehrenbach, 2016).

De La Salle firmly believed that "the child that knows how to read and write will be capable of anything" (Christian Brothers Conference, 1996, p. 161). Fehrenbach (2016) recognized "academic excellence" (p. 72) as one of the core values of Lasallian schools and underlined a strong focus on "solid academics accompanied by high expectations" (p. 72). Today's academic excellence is often synonymous with the scores of standardized tests, but assessment in Lasallian schools has never been the final goal or ultimate measure of success. De La Salle and his first Brothers used daily assessments and formal monthly assessments as a critical tool to measure their students' progress and to determine the students' movement. But, again, they never considered these assessments as a measure of success. In the Lasallian schools from the Founder's time, "success was understood in the context of mission" (Fehrenbach, 2016, p. 72), always reminding the Lasallian educators of the actual purpose of their educational ministry. Their work is to provide salvation to youth, to give them life opportunities, to help raise a new generation, and to change the world. This leads to the bigger picture of academic excellence, not just focusing on curriculum or students' performance on assessments but expanding quality education to the "entire reality, with the mission always at the core" (Fehrenbach, 2016, p. 73).

The focus on academic excellence in Lasallian education is also closely related to *Quality Education*, one of five Lasallian core principles. According to Fehrenbach (2016), quality education in the Lasallian schools refers to meeting the standards of excellence by developing and maintaining diverse programs, and providing comprehensive, accessible, and practical education. And the school which provides students with quality education and academic

excellence is "living and growing and deepening" (Fehrenbach, 2016, p. 73).

Spiritual Development in Lasallian Education

Lasallian education focuses on students' spiritual development. Another prominent Lasallian educational characteristic is "an educational work of quality…within which interiority (spiritual living) is fostered and strengthened" (Mann, 2018, p. 31). One of the Lasallian identity and vitality criteria (CIAMEL, 2018) is "Accompanying students in their development," which consists of these four factors: "Fostering the active participation of students in their own formation; Being mediators of the students' self-development process; Promoting an attitude of service; and Offering programs and strategies to solve special needs" (p. 6). This criterion emphasizes students' formation process through the development of inner life, of necessary skills, including spiritual skills, and of an attitude of service resulting in solidarity and the "transcendent meaning of life" (CIAMEL, 2018, P. 6). According to LaSalle universities (n.d.) in Europe, one of the bases of Lasallian institutions of higher education is that it should be founded upon the transcending purpose of human persons.

According to Fehrenbach (2016), "faith and spirituality" (p. 36) is another core value of Lasallian education. De La Salle was a priest who was born and raised in a Catholic family in a Catholic nation, France. For De La Salle, faith was all about a "relationship with God through the message and person of Jesus" (p. 36). He wanted to be connected to the mystery of God, and the Christian Gospel was his starting point. De La Salle mentioned faith as an intrinsic quality of salvation, and his focus was the "love of Christ for his followers," and the "relational nature of the mystery" (p. 36). For De La Salle, experiencing and sharing this mystery of faith was a significant part of the educational process (Fehrenbach, 2016).

Today, Lasallian schools rooted in De La Salle's spirituality, continue to invite students to a "commitment to seeking truth and the service of others" (Fehrenbach, 2016, p. 38). According to Fehrenbach (2016), Lasallian education recognizes the importance of the "inward journey" that is, the "spiritual journey" (p. 38) in students' long-term development. And Lasallian educators deeply care about their students' spiritual development—their inner journey toward self and the discovery of who they really are as persons.

Social Development in Lasallian Education

Lasallian education stresses the significance of students' social development. According to Mann (2018), Lasallian education is an education that is "fundamentally relational" and "community-based" (p. 31). From the beginning of the Institute, Brothers are committed to be "brothers" to each other, so they can be "older brothers" to the students they serve. In their 1997 Declaration, the Brothers of the Christian Schools emphasized the importance of education to each person's attempt to be fully human. The Brothers also emphasized the significance of social development for students in education to be fully human, because the Brothers recognized that humans are social beings. According to the Brothers of the Christian Schools (1997), without human relationships with others, "one can neither live as a human being nor develop one's human qualities" (Declaration, 44.2, p. 31).

According to CIAMEL (2018), one of the distinguishing Lasallian identity and vitality criteria is "Operating through educational communities" (p. 5), and this criterion is composed of four factors, as follows: "Promoting fraternal relationships; Living the teaching profession as a vocation; Fostering faith, prayer and service groups; and Experiencing association" (p. 5). Lasallian schools are most of all, educational communities, and Lasallian education invites students to a formation and spiritual experience (CIAMEL, 2018) in the community. Teaching is a "relationship" in Lasallian schools, and the educational experience takes place in the community (Fehrenbach, 2016). LaSalle universities (n.d.) in Europe recognize "A vision of an educational relationship" as one of their identities as Lasallian institutions of higher education. Schieler (2018) highlighted "community" as one of three touchstones of Lasallian identity that are essential to Lasallian higher education. Lasallian educational communities are characterized by "inclusivity, respect, dialogue, and accompaniment" (p. 104).

When De La Salle started to respond to the educational needs of poor youth in 17th century France, teaching was an "individual and isolating work" (Fehrenbach, 2016, p. 87). The educational model of the time was simple interactions between one instructor and one student on the lessons. De La Salle saw needs for the new educational praxis and began to change the whole system by training his teachers and elevating them (Fehrenbach, 2016). He formed the community of teachers, and the core of the community was the mission, rooted in faith

and Gospel values. And the mission had a power to transform the lives of poor youth and further, the social construction of their time (Fehrenbach, 2016). In the process, at the very beginning of the Institute, De La Salle's first Brothers made an important decision to leave the title "Teacher" behind and choose the name "Brother" instead. This made it very clear what kind of relationships they wanted to establish between their students and themselves (LaSalle universities, n.d.). De La Salle and his Brothers completely believed that the quality of the relationship between teacher and student constituted the most important aspect of education (Fehrenbach, 2016). Today's Lasallian educators still strive to implement this educational relationship based on fraternity among their colleagues and students (LaSalle universities, n.d.). As mentioned in the Declaration (Brothers of the Christian Schools, 1997), humans are social beings, and we grow together in community (Fehrenbach, 2016). The school is transformative when it functions as a community. Through their social development in the fraternal environment of the community, students are to deepen their "attention to the people" and the "respect for the differences among them" (Hengemüle, 2006, p. 50).

Career Development in Lasallian Education

Lastly, Lasallian education serves students' career development. Mann (2018) distinguished one of the Lasallian educational characteristics as a practical education. Lasallian education provides students with practical knowledge and skills and prepares them for "work," "life," and "civic engagement" (Mann, 2018, p. 31). Based on the Founder's educational philosophy, Brother Rodríguez Echeverría (2018), while contemplating the aim of a Lasallian universities' educational mission, asks this question: "Where do men or women who leave our institutions succeed professionally?" (p. 112) In the Lasallian identity and vitality criteria, CIAMEL (2018) mentioned the importance of career development in Lasallian education multiple times, such as monitoring student's self-development to gain necessary skills including "professional" skills (p. 6) and development of competencies eventually to reach "professional productivity" (p. 7).

From the very beginning of the Institute, Lasallian education has been a practical education for the salvation of the poor youth by preparing them for employment (Goussin, 2003). De La Salle wrote in his *Meditation for the Time of Retreat* that poor youth in France were having a hard time adjusting when they reached the age to go to work, but through education

in the Christian Schools, "they [were] prepared for employment" (MTR 194.1) (Christian Brothers Conference, 1994, p. 435). Regarding class subjects, De La Salle believed the content should be practical to make sure that youth acquired the necessary skills for a productive life: i.e., obtain a job, take care of their families and pull themselves out of poverty. Lasallian education had concrete outcomes for students' lives after school, which was an "occupation" (Fehrenbach, 2016, p. 27).

Today, students' career development is still an important part of Lasallian education, and moreover, education is a tool for students to give back to their communities (Fehrenbach, 2016). According to Schieler (2018), "service" is the third touchstone of Lasallian higher education. Through their career development, students will find a way to live out the Lasallian mission in their professional lives as well as in their personal lives. Lasallian institutions of higher education "invite young people to 'enter to learn' and expect that they 'leave to serve' the common good" (Schieler, 2018, p. 106).

Lasallian education is education for life. It aims to prepare the youth for the "kind of life they will lead in the world, to integrate them into human society, and to make them capable of serving the earthly city" (Declaration, 40.4) (Brothers of the Christian Schools, 1997, p. 29). In summary, through the involvement of laity into Catholic education including Catholic higher education, the importance of institutional mission is receiving more and more attention. The Catholic Church, Catholic education, and Lasallian education have responded to the changes and needs of given time, such as emphasizing Catholic identity and developing "shared mission." In this historical moment of unprecedented growth of worldwide Lasallian higher education, the Lasallian mission as the foundation of Lasallian education for holistic student development is essential. The need for this study, attempting to measure how college students perceive the impact of the Lasallian mission on their development, will validate the work done yet illuminate gaps along the way. The results will reveal a road map toward a much fuller articulation of De La Salle's vision in the future.

Method

Research Design

This study examined students' personal understanding of and value for the mission of

Lasallian institutions of higher education and students' perceptions of the Lasallian mission impact on their holistic development: academic development [Academic Impact], spiritual development [Spiritual Impact], social development [Social Impact], and career development [Career Impact].

To answer the research questions, a descriptive quantitative research method was selected, utilizing the methodology of survey research and the tools of questionnaires and statistical analysis. For the investigation, the survey instrument, Lasallian Mission Impact Inventory [LMII] was designed by the researcher. This international research project was conducted in three different languages: English, Spanish, and French.

Utilizing LMII, data for this study was collected in Spring 2020 from college students who were attending six Lasallian institutions of higher education in the five Lasallian Regions—Africa (RELAF), Asia/Oceania (PARC), Europe/Mediterranean (RELEM), Latin America (RELAL), and North America (RELAN). These six participating institutions were: (1) Bethlehem University, Palestine, RELAN (BU-Palestine); (2) De La Salle University, Manila, Philippines, PARC (DLSU-Philippines); (3) Saint Mary's College of California, USA, RELAN (SMC-USA); (4) Christ the Teacher Institute for Education, Tangaza University College, Kenya, RELAF (TUC-Kenya); (5) UniLaSalle, Beauvais, France, RELEM (ULS-France); and (6) Universidad La Salle, Mexico, RELAL (ULS-Mexico). Responses from 1,000 students (n = 1,000) to LMII were computed. The data was analyzed through the Statistical Package for the Social Sciences (SPSS).

Participating Institutions

The site for this study was six Lasallian institutions of higher education in different Lasallian Regions. Participating schools were selected through collaboration with and support from the General Councilor for Lasallian Higher Education in Rome and the International Association of Lasallian Universities (IALU). One institution from each Lasallian Region was selected, and Bethlehem University was added considering its unique location notwithstanding its Regional membership. All six participating institutions provide their students with various mission programs, such as academic courses, liturgies, prayer services, residential programs, service trips, workshops, conferences, retreats, and informal gatherings.

Christ the Teacher Institute for Education, Tangaza University College (RELAF)

Located in Langata South Road, Nairobi, Kenya, Tangaza University College is a Constituent College of the Catholic University of Eastern Africa (CUEA), which was granted a charter by the President of Kenya in 1992 (Tangaza University College, About Us, 2019). Over 2,200 students from more than 50 different countries are enrolled at the college, and the student-faculty ratio is 20:1 (Tangaza University College, Why Study at Tangaza? 2019). Tangaza University College's academic organization is based on Institutes. There are eight institutes: School of Theology, Institute of Social Ministry in Mission (ISMM), Christ the Teacher Institute for Education (CTIE), Institute of Spirituality and Religious Formation (ISRF), Maryknoll Institute of African Studies (MIAS), Institute of Social Communication (ISC), Institute of Youth Studies (IYS), and Center for Leadership and Management (CLM). The college offers undergraduate degrees, master's degrees, and a doctorate degree (PhD in Social Transformation). Various diploma programs and certificate programs are also offered (Tangaza University College, About Us, 2019).

Christ the Teacher Institute for Education was established in 1996. This institute is sponsored by Saint Mary's University of Minnesota, which is one of the six Lasallian institutions of higher education in the United States. Since 1955, the Brothers of the Christian Schools have been involved with secondary school management in East Africa. They initiated a teacher training program in Nairobi, Kenya and founded Christ the Teacher Center. In 1993, Saint Mary's University of Minnesota was requested to sponsor the Center as an institute of its School of Education. Later, its official name became Christ the Teacher Institute for Education (CTIE) when it was accredited. In May 1997, the first graduates of CTIE received the bachelor of science in education degree from Saint Mary's University. In 2005, the title of the degree changed to bachelor of education. In 2013, CTIE added the master of education in educational leadership and administration (Saint Mary's University of Minnesota, University Catalog, 2018).

As an institute belonging to a Lasallian institution of higher education, CTIE is based on "Lasallian educational values," and seeks to prepare and inspire educators "to see their work as a vocation and not just a profession"—work that will make an actual difference in people's lives (educartis, n.d.). The Lasallian slogan of "teaching minds, touching hearts and

transforming lives" provides the foundation for the formation of well-rounded educators at CITE. Under the institute's mission of "value driven information, formation, innovation and social transformation," CTIE offers many courses in social sciences, liberal arts, and religious studies to form holistic educators, as well as required teaching courses (GLUNIS, n.d.). This is all in service of preparing authentic Lasallian educators for the country and beyond.

De La Salle University, Manila (PARC)

De La Salle University, abbreviated as DLSU, was founded in 1911 by the Brothers of the Christian Schools and is currently located on Taft Avenue, in Malate, Manila, Philippines. As of February 2019, the number of enrolled students totaled 16,704. Out of the 11,527 undergraduate students, 6,123 are male and 5,404 are female. The student body also includes 314 international students from 17 different countries. Out of the 5,177 graduate students, 2,350 are male and 2,827 are female. That group includes 186 students from 27 countries. There are eight colleges and schools in DLSU. They are: Br. Andrew Gonzalez College of Education, College of Computer Studies, College of Law, College of Liberal Arts, College of Science, Gokongwei College of Engineering, Ramon V. del Rosario College of Business, and School of Economics. Thirty-six academic departments offer doctoral, master's, bachelor's degrees, as well as senior high school diploma and certificate programs (De La Salle University, QUICK FACTS AND FIGUES, 2019).

In 1901, the American Archbishop of Manila, Jeremiah Harty, asked the Brothers of the Christian Schools to introduce English-based quality Catholic education in the Philippines. In 1911, nine Brothers from Europe and United States opened the first La Salle school in the country. During the years-long preparation for the centennial celebration of Lasallian presence in the country, the Philippine Lasallian community developed the Lasallian Guiding Principles (LPG) in 2003; the Lasallian Pedagogical Framework (LPF) and the Lasallian Core Curriculum (LCC) in 2004; and the Expected Lasallian Graduate Attributes (ELGAs) in 2008 (De La Salle University, HISTORY AND TRADITIONS, 2013). DLSU is the oldest constituent of De La Salle Philippines (DLSP) which is a network of 16 Lasallian institutions. DLSP was founded in 2006 to replace the De La Salle University System (Wikipedia, De La Salle University, 2020).

The Lasallian heritage of DLSU is clearly stated in its preamble: "Inspired by the charism of

St. John Baptist de La Salle, the University community, together and by association, provides quality human and Christian education by teaching minds, touching hearts, and transforming lives." The institution also sets forth its vision-mission, which is based on three core values—faith, service and communion—this way: "A leading learner-centered and research University bridging faith and scholarship, attuned to a sustainable Earth, and in the service of Church and society, especially the poor and marginalized." (De La Salle University, VISION-MISSION, 2017).

UniLaSalle, Beauvais (RELEM)

UniLaSalle consists of three campuses: Beauvais, Rouen, and Rennes. It provides 2,900 students with five-year engineering programs in Earth, life and environmental sciences and offers 20 degree programs from bachelor's to advanced master's courses (UniLaSalle, About UniLaSalle, 2019). The UniLaSalle, Beauvais campus is serving 1,850 engineering students and focuses on the fields of agronomy, agrifood, food-health and geosciences (UniLaSalle, Campus Beauvais, 2019).

In 1854, the Institute Normal Agricole was founded by Brother Ménée, Louis Gossin and Edouard de Tocqueville. It became the Institute Agricole de Beauvais and later, the Institute Supérieur d'Agriculture de Beauvais (ISAB). In 1855, the first students arrived. UniLaSalle resulted from the merger of the Institute Supérieur d'Agriculture de Beauvais (ISAB), the Institute Géologique Albert-de-Lapparent (IGAL), and the Ecole Supérieure d'Ingénieurs et de Techniciens pour l'Agriculture (ESITPA) (Wikipedia, Unilasalle, 2020).

UniLaSalle characterizes itself, first and foremost, as "A Lasallian School," one "[f]ounded in 1854 by the Brothers of the Christian Schools, whose work is driven by the educational precepts of Jean-Baptist de La Salle," and which belongs to "the La Salle Network" (UniLaSalle, About UniLaSalle, 2019). The educational project of UniLaSalle has three axes: "(1) The attention given to each young person entrusted to us; (2) Involvement of all; and (3) Commitment and responsibility as a vector of fulfillment." (UniLaSalle, Educational project and values, 2019). Regarding the first axis, UniLaSalle emphasizes the "educational accompaniment of students" as the first mission of the institution, embodied through attention to students' difficulties and personalized support for them. The second axis focuses on the

involvement of all constituencies and shared values among them, such as "A sense of community; Respect for self and others; The ability to engage; The sense of justice; and The commitment to fight against poverty." The third axis stresses students' involvement in community life and school life as a "unique experience of learning responsibility," based on Lasallian pedagogy (UniLaSalle, Educational project and values, 2019).

Universidad La Salle, Mexico (RELAL)

Universidad La Salle Network has 15 campuses in Mexico, and the main campus, Universidad La Salle Mexico, is in Mexico City, Mexico. The other 14 campuses are: Universidad De La Salle Bajío León, Guanajuato; Universidad La Salle Cancún Cancún, Quintana Roo; Universidad La Salle Benavente Puebla, Puebla; Universidad La Salle Chihuahua Chihuahua, Chuhuahua; Universidad La Salle Cuernavaca Cuernavaca, Morelos; Universidad La Salle Laguna Gomez Palacio, Durango; Centro de Estudios Superiores La Salle Monterrey, Nuevo León; Universidad La Salle Morelia Morelia, Michoacán; Universidad La Salle Nezahualcóyotl Nezahualcóyotl, Edo. de México; Universidad La Salle Noroeste Ciudad Obregón, Sonora; Universidad La Salle Oaxaca Santa Cruz Xoxocotlán, Oaxaca; Universidad La Salle Pachuca Pachuca, Hidalgo; Universidad La Salle Saltillo Saltillo, Coahuila; and Universidad La Salle Victoria Ciudad Victoria, Tamaulipas (Universidad La Salle México, La Salle System and Network, n.d.).

Universidad La Salle Mexico was founded in 1962 as the first Lasallian university in Latin America. Brother Manuel de Jesús Álvarez Campos took on the project of establishing a university to respond to the need of a country that was going through industrialization in the 1950s and 60s. The relocation of the Preparatory of the Christopher Columbus College in February 1962 from Colonia San Rafael to Colonia Condesa in Mexico City was the beginning of Universidad La Salle Mexico. By May 1962 it had grown so fast it transformed into a Higher Education Center. Since then, it has continued to grow, and there are campuses of Universidad La Salle in 15 Mexican states (Universidad La Salle México, We are La Salle, n.d.).

For undergraduate education, there are eight academic departments: Mexican Faculty of Medicine; School of Higher Health Studies; Faculty of Engineering; Faculty of Law; Mexican Faculty of Architecture, Design and Communication; Faculty of Humanities and

Social Sciences; Faculty of Chemical Sciences; and Faculty of Business. Overall, Universidad La Salle Mexico offers high school diplomas, bachelor's, master's, and doctorate degrees (Universidad La Salle México, Educative offer, n.d.). Total enrollment is approximately 10,000 students (Wikipedia, Universidad La Salle, 2020).

These are the five values of the institution: Fraternity, Faith, Justice, Commitment, and Service. These values are governing principles of personal and professional actions at Universidad La Salle (Universidad La Salle, Mexico, Identity, n.d.). Its corporate identity is symbolized in an isotype and a logo. Together, they represent "the ideology and the mission of the University vis-à-vis society." The isotype consists of "six interlocking chevrons." The interior three chevrons represent "substantive functions, teaching, research and extension," and the exterior three chevrons represent "Lasallian values, faith, fraternity and service" (Universidad La Salle, Mexico, Identity, n.d.).

Saint Mary's College of California (RELAN)

Saint Mary's College of California was established in 1863 and is currently located in Moraga, California, USA. It was originally located in San Francisco and moved to Oakland in 1889, then in 1928 settled in its current location. In the mid-19th century, Archbishop Joseph Alemany was sent to the West Coast by Pope Pius IX, and the archbishop opened Saint Mary's College in 1863. After struggling for five years, he asked the Brothers of the Christian Schools for help. In 1868, nine Brothers arrived in San Francisco from New York. Soon, the Brothers, by increasing enrollment and stabilizing the finances, placed the school on such a stable foundation that it was the largest institute of higher education in California at the time. In 1872, the first bachelor's degrees were conferred (About SMC, Our History, n.d.).

As of fall 2019, 3,572 students (2,526 undergraduate and 1,046 graduate students) are enrolled, and 43 academic programs (majors) are offered. Average undergraduate class size is 20, and student-faculty ratio is 10:1. There are four schools: School of Economics and Business Administration, School of Liberal Arts, School of Science, and the Kalmanovitz School of Education (graduate and professional programs only). Regarding the graduate programs, 12 Master's degrees and two Doctorate degrees are offered (About SMC, Facts &

Figures, n.d.).

The Fall 2019 undergraduate first-year student population is 55.8 percent female and 44.2 percent male. Regarding ethnicity, 37.5 percent of the students are White, 29.6 percent Hispanic/Latino, 16.4 percent Asian, 7.8 percent African American/Black, 1.6 percent Native American, 3.1 percent Hawaiian/Pacific Islander, 2.7 percent International, and 1.3 percent Other/not reported. Geographically, 74 percent of them are from Northern California, 12 percent from Southern California, 11 percent from out of state, and 3 percent are international students. Ninety-seven percent of first-year students live on camps, and overall 55 percent of undergraduate students reside on campus (About SMC, Facts & Figures, n.d.).

Saint Mary's College has three core traditions: The liberal arts tradition, the Catholic tradition, and the Lasallian tradition (About SMC, Core Traditions, n.d.). These three traditions are the guiding principles as the institution pursues its mission, which is this: "To probe deeply the mystery of existence by cultivating the ways of knowing and the arts of thinking; To affirm and foster the Christian understanding of the human person which animates the educational mission of the Catholic Church; and To create a student-centered educational community whose members support one another with mutual understanding and respect" (About SMC, Our Mission, n.d.). The student-centered Lasallian educational tradition is especially emphasized as a "distinguishing characteristic of Saint Mary's College" (Living Lasallian, 2015, January).

Bethlehem University (RELAN)

Bethlehem University was founded in 1973 and is in Bethlehem, West Bank, Palestine. It was the first registered university in the Palestine and is the only Catholic institution of higher education in the Holy Land. After the visit of Pope Paul VI to the Holy Land in 1964, his express wish to help the Palestinian people was realized by the establishment of a four-year university. The Vatican approached Brother Charles Henry, the Superior General of the Brothers of the Christian Schools in 1973. With financial assistance from the Vatican and the administrative support from the Brothers of the Christian Schools, Bethlehem University opened its doors to 112 students on October 1, 1973 (About Us, Mission and History, n.d.).

As of Fall 2019, total enrollment is 3,259 students (2,989 undergraduate and 270 graduate

students). The student population is 21 percent male and 79 percent female. Seventy-eight percent of the students are Muslim students and 22 percent are Christian students. The student to teacher ratio is 16 to 1. There are six colleges in Bethlehem University: Faculty of Education, Faculty of Arts, Faculty of Business Administration, Faculty of Nursing & Health Sciences, Faculty of Science, and Institute of Hotel Management & Tourism (Vice Chancellor's Office, Institutional Research Unit, 2019).

As clearly stated in its mission statement, "Bethlehem University is a Catholic co-educational institution in the Lasallian tradition whose mission is to provide quality higher education to the people of Palestine and to serve them in its role as a center for the advancement, sharing and use of knowledge." The institution focuses on academic excellence and developing students as future leaders of society, and it also fosters having its students "share values," find "moral principles," and dedicate themselves "to serving the common good" (About Bethlehem University, Mission & History, 2020).

Participants

As mentioned above, six Lasallian institutions of higher education were selected to participate. The target population was all undergraduate students of the six institutions. At each institution, students from different majors and various demographic backgrounds, in terms of education level (year), gender, religion, age, transfer experience, Lasallian mission program experience, and previous Lasallian education experience, were recruited by the directors of Institutional Research or the administrators who the directors designated (correspondents), through the e-mail invitation.

Instrument

A survey instrument, called the "Lasallian Mission Impact Inventory" [LMII], was developed by the researcher. The survey instrument consists of 27 questions.

Measures

There are seven quantitative variables, including age and six composite variables of Lasallian

Mission Understanding, Lasallian Mission Value, Academic Impact, Spiritual Impact, Social Impact, and Career Impact. Each composite variable is created by taking the row means of three Likert-type questions, and the last item is reverse coded.

Lasallian Mission Understanding is a composite variable for the students' understanding of the institution's Lasallian mission. This variable is created by taking the row mean of responses to LMII items 1, 2, and 3. Each item has four values (1="strongly disagree," 2="disagree," 3="agree" and 4="strongly agree"), and item 3 is reverse coded.

Lasallian Mission Value is a composite variable for the value students place on the Lasallian mission. This variable is created by taking the row mean of responses to LMII items 4, 5, and 6. Each item has four values (1="strongly disagree," 2="disagree," 3="agree" and 4="strongly agree"), and item 6 is reverse coded.

Academic Impact is a composite variable for the impact of the institutional mission on students' academic development. This variable is created by taking the row mean of responses to LMII items 7, 8, and 9. Each item has four values (1="strongly disagree," 2="disagree," 3="agree" and 4="strongly agree"), and item 9 is reverse coded.

Spiritual Impact is a composite variable for the impact of the institutional mission on students' spiritual development. This variable is created by taking the row mean of responses to LMII items 10, 11, and 12. Each item has four values (1="strongly disagree," 2="disagree," 3="agree" and 4="strongly agree"), and item 12 is reverse coded.

Social Impact is a composite variable for the impact of the institutional mission on students' social development. This variable is created by taking the row mean of responses to LMII items 13, 14, and 15. Each item has four values (1="strongly disagree," 2="disagree," 3="agree" and 4="strongly agree"), and item 15 is reverse coded.

Career Impact is a composite variable for the impact of the institutional mission on students' career development. This variable is created by taking row mean of responses to LMII items 16, 17, and 18. Each item has four values (1="strongly disagree," 2="disagree," 3="agree" and 4="strongly agree"), and item 18 is reverse coded. *Age* is a variable for participant's age. And this variable is created by responses to LMII item 23.

Five nominal categorical variables are included in the study. And they are college major, religion, gender, Lasallian mission programs, and school (Lasallian Region). *Major* is a variable for participant's major(s). LMII item 22 measures this variable.

Religion is a variable for participant's selected category for religion: "Roman Catholic," "Baptist," "Methodist," "Presbyterian," "Lutheran," "Episcopalian," "Church of Christ," "Eastern Orthodox," "United Church of Christ," "Latter-Day Saint (Mormon)," "7th Day Adventist," "Unitarian," "Quaker," "Jewish," "Buddhist," "Hindu," "Islamic," "Other Religion," "None" and "Other." LMII item 24 measures this variable.

Gender is a variable for participant's gender: "Female," "Male," "Prefer Not to Answer," and "Other." LMII item 25 measures this variable.

Lasallian Mission Programs is a variable for types of Lasallian mission-related programs that participants have attended: "Academic courses," "Liturgies/prayer services," "Residential programs," "Service trips/internships," "Workshops," "Conferences," "Retreats," "Charism projects," "Immersion experiences," "Informal gatherings," "Study abroad," "Membership in organizations," "Formation programs," "None," and "Other." LMII item 20 measures this variable.

School/Lasallian Region is a variable for participant's institution: "Tangaza University College, Nairobi (RELAF)," "De La Salle University, Manila (PARC)," "UniLaSalle, Beauvais (RELEM)," "Universidad La Salle, Mexico (RELAL)," "Saint Mary's College of California (RELAN)," and "Bethlehem University (RELAN)." LMII item 27 measures this variable.

One ordinal categorical variable, education level (year), is included. The five-year academic program of a participating institution is taken into consideration. *Education Level* is a variable for participant's academic year: "First Year," "Second Year," "Third Year," "Fourth Year," "Fifth Year," and "Other." LMII item 26 measures this variable.

In addition, there are two dichotomous dummy variables. They are participant's previous

Lasallian education experience and transfer experience. *Previous Lasallian Education Experience* is a variable for participant who previously attended Lasallian school(s): 1= "yes," 0= "no." LMII item 19 measures this variable. *Transfer* is a variable for participant who identifies as a transfer student: 1= "yes," 0= "no." LMII item 21 measures this variable.

And below is how the research questions and the specific survey questionnaire items correspond to each other.

Research Question 1-a): Items 1, 2, 3
Research Question 1-b): Items 4, 5, 6
Research Question 1-c): Items 1, 2, 3, 4, 5, 6
Research Question 2-a): Items 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18
Research Question 2-b): Items 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18
Research Question 2-c): Items 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18
Research Question 3-a): Items 4, 5, 6, 19
Research Question 3-b): Items 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19

Data Collection

In the spring semester of 2020, in collaboration with the Office of Mission, the directors/correspondents of Institutional Research of six Lasallian institutions of higher education suggested by the General Councilor, administered the online survey to their students. According to Fowler (2014), a much higher response rate can be anticipated when the survey request is coming from an identifiable source, such as the respondents' institution, than when the request comes from unknown sources.

The correspondents at each school sent an e-mail invitation with a link and distribute the survey on Monday, May 4, 2020, to students through school e-mail. The e-mail instruction was resent to the correspondents on the day. Students mostly used their personal computer to access the survey. The estimated time for survey completion was approximately 10 minutes at one sitting.

Regarding the data collection process, the initial timeline for the survey, was 15 days from Monday, May 4, 2020 to Monday, May 18, 2020. However, the spring semester of 2020

ended up being like no other. Due to the unprecedented COVID-19 pandemic in 2020, the timeline needed to be extended. Among the research sites, some schools located in big cities requested on extension of the survey closure date. The researcher felt that it was a reasonable request and an appropriate accommodation to extend the survey duration, given the magnitude of the global pandemic. Therefore, the survey closure date was extended, and the survey remained open until Tuesday, June 30, 2020.

Overall, 1,003 responses were received. The expected response rate was 10-15 percent, and it was achieved with exceptions of two schools located in big cities. The survey responses were transformed into data files for data analysis. There is no need for the responses to be retranslated, except for some vocabulary such as specific majors. And no incentives were offered for participation. Considering confidentiality and data security, no direct identifiers that are associated with the research data collected or recorded. Incomplete surveys were supposed to not be used for data analysis, but there were no incomplete surveys.

Data Analysis

The instrument, LMII, was utilized to gather the data on the perceptions of the Lasallian mission impact on college students' development. The data collected from college students of the six different Lasallian institutions were analyzed utilizing the Statistical Package for the Social Sciences (SPSS) through the process of code designing, coding, data entry and data cleaning (Fowler, 2014). Furthermore, the statistical analyses included frequencies, means, standard deviations, correlation, and regression analysis.

A total of 1,003 responses were received. However, the sample should be representative of the population. From the perspective of the population, which comprises traditional college students, three responses have been excluded, for two reasons. First, two responses were not the appropriate age group (11 and 15). Second, one response in the age section was a data input error (201904470). As a result, the total counts of responses became 1,000 (n = 1,000).

Research question 1 explored the relationship between Lasallian Mission Understanding and Lasallian Mission Value. This was tested through statistical analyses of survey responses to items 1 to 6 of LMII. Correlation analysis was performed to investigate the correlation

coefficient between variables of Lasallian Mission Understanding and Lasallian Mission Value.

Research question 2 investigated the relationship between Lasallian Mission Value and Lasallian Mission Impact, which includes academic development, spiritual development, social development, and career development [Academic Impact, Spiritual Impact, Social Impact, and Career Impact]. This was examined through statistical analyses of survey responses to items 4 to 18 of LMII. Correlation analyses were performed to investigate the correlation coefficient between variables. The findings also indicated which type of Lasallian Mission Impact variable has the strongest correlation with the Lasallian Mission Value variable.

Research question 3 examined the relationships among Lasallian Mission Value, having Previous Lasallian Education Experience, and Lasallian Mission Impact (Academic Impact, Spiritual Impact, Social Impact, and Career Impact). This investigation was achieved through statistical analyses of survey responses to items 4 to 19 of LMII. First, regression analysis was employed to examine the relationship between the outcome variable (Lasallian Mission Value) and Previous Lasallian Education Experience (yes/no). Then, stepwise regression analysis was performed to explore the relationships among Lasallian Mission Impact [Academic Impact, Spiritual Impact, Social Impact, and Career Impact], Previous Lasallian Education Experience, and Lasallian Mission Value. In Model 1, each mission impact was regressed on Lasallian Mission Value. In Model 2, each mission impact was regressed on Lasallian Mission Value and Previous Lasallian Education Experience.

Results

This section reports the demographic information of the sample, major findings from the statistical analysis of data, and a summary of the findings. The findings are presented according to the three research questions: First, the relationship between students' understanding of the mission and how much they personally value the mission; second, the relationship between how much students personally value the mission and the impact of the mission on their holistic development—academic, spiritual, social, and career; and third, the relationships between how much students personally value the mission, their previous Lasallian education experience, and the impact of the Lasallian mission on their holistic

development.

Demographic Information

Participants' responses to items 21 to 27 provided demographic information of the sample. Tables 1 to 7 report descriptive statistics of six institutions: gender, age, education level (year), transfer experience, major, and religion. Table 1 summarizes the participation across the six institutions.

Table 1. Descriptive Statistics: Institutions

Institution (Name)	Country	Lasallian Region	N	%
Bethlehem University	Palestine	RELAN	154	15.4
De La Salle University, Manila	Philippines	PARC	181	18.1
Saint Mary's College of California	USA	RELAN	341	34.1
Tangaza University College	Kenya	RELAF	59	5.9
UniLaSalle, Beauvais	France	RELEM	214	21.4
Universidad La Salle, Mexico	Mexico	RELAL	51	5.1
Total			1000	100.0

Table 2 shows frequency and percentage of the sample (n = 1000) according to gender. At all six institutions/countries, more female students than male students responded to the survey. Overall, the number of female participants (64.9%) was twice the number of male participants (32.5%). Also, 2.6 percent of participants chose non-binary options.

Table 2. Descriptive Statistics: Gender

	Male	Female	Prefer Not to Answer	Other	Total
All Institutions	325 (32.5%)	649 (64.9%)	24 (2.4%)	2 (0.2%)	1000 (100%)
BU-Palestine	35 (22.7%)	112 (72.7%)	7 (4.5%)	0 (0.0%)	154 (100%)
DLSU-Philippines	63 (34.8%)	112 (61.9%)	5 (2.8%)	1 (0.6%)	181 (100%)
SMC-USA	106 (31.1%)	229 (67.2%)	5 (1.5%)	1 (0.3%)	341 (100%)
TUC-Kenya	26 (44.1%)	32 (54.2%)	1 (1.7%)	0 (0.0%)	59 (100%)
ULS-France	82 (38.3%)	127 (59.3%)	5 (2.3%)	0 (0.0%)	214 (100%)
ULS-Mexico	13 (25.5%)	37 (72.5%)	1 (2.0%)	0 (0.0%)	51 (100%)

Note. BU-Palestine = Bethlehem University, Palestine (RELAN); DSLU-Philippines = De La Salle University, Manila, Philippines (PARC); SMC-USA = Saint Mary's College of California, Moraga, USA (RELAN); TUC-Kenya = Tangaza University College, Nairobi, Kenya (RELAF); ULS-France = UniLaSalle, Beauvais, France (RELEM); ULS-Mexico = Universidad La Salle, Mexico City, Mexico (RELAL)

Table 3 reports the age distribution. The average age of this sample is 21. Among the six institutions/countries, the highest age group is TUC-Kenya (RELAF) (M = 29.69) and the second highest is ULS-Mexico (RELAL) (M = 23.76).

Table 3. Descriptive Statistics: Age

	N	Minimum	Maximum	Mean	Standard Deviation
All	1000	17	63	20.99	4.24

Institutions					
BU-Palestine	154	18	49	20.03	2.87
DLSU-Philippines	181	18	30	19.75	1.31
SMC-USA	341	17	56	20.63	3.51
TUC-Kenya	59	19	47	29.69	6.46
ULS-France	214	17	28	20.24	1.76
ULS-Mexico	51	18	63	23.76	8.60

Table 4 represents the distribution of participants' education level (year). Overall, first-year participants (30.2%) make up the biggest group in the sample. The higher the year, the fewer the participants. Most of the institutions/countries have first year students as the biggest group with the exceptions being TUC-Kenya (RELAF) and ULS-France (RELEM). At Tangaza University College, the fourth-year students (35.6%) are the biggest group, and at UniLaSalle, second-year students (29.0%) are the biggest one.

Table 4. Descriptive Statistics: Education Level (Year)

	First Year	Second Year	Third Year	Fourth Year	Fifth Year	Other	Total
All Institutions	302 (30.2%)	251 (25.1%)	230 (23.0%)	167 (16.7%)	34 (3.4%)	16 (1.6%)	1000 (100%)
BU-Palestine	54 (35.1%)	42 (27.3%)	20 (13.0%)	36 (23.4%)	2 (1.3%)	0 (0.0%)	154 (100%)
DLSU-Philippines	65 (35.9%)	38 (21.0%)	62 (34.3%)	6 (3.3%)	8 (4.4%)	2 (1.1%)	181 (100%)
SMC-USA	95 (27.9%)	90 (26.4%)	82 (24.0%)	67 (19.6%)	5 (1.5%)	2 (0.6%)	341 (100%)

	First Year	Second Year	Third Year	Fourth Year	Fifth Year	Other	Total
TUC-Kenya	12 (20.3%)	13 (22.0%)	12 (20.3%)	21 (35.6%)	0 (0.0%)	1 (1.7%)	59 (100%)
ULS-France	54 (25.2%)	62 (29.0%)	50 (23.4%)	28 (13.1%)	19 (8.9%)	1 (0.5%)	214 (100%)
ULS-Mexico	22 (43.1%)	6 (11.8%)	4 (7.8%)	9 (17.6%)	0 (0.0%)	10 (19.6%)	51 (100%)

Table 5 displays the frequency and percentage of transfer students in the sample. Only 13 percent of participants have transfer experience. Among the six institutions/countries, SMC-USA (RELAN) has the biggest transfer student group (20.2%) and ULS-France (RELEM) has the smallest transfer student group (5.1%).

Table 5. Descriptive Statistics: Transfer Experience

	No Transfer	Transfer	Total
All Institutions	870 (87.0%)	130 (13.0%)	1000 (100%)
BU-Palestine	135 (87.7%)	19 (12.3%)	154 (100%)
DLSU-Philippines	166 (91.7%)	15 (8.3%)	181 (100%)
SMC-USA	272 (79.8%)	69 (20.2%)	341 (100%)
TUC-Kenya	49 (83.1%)	10 (16.9%)	59 (100%)
ULS-France	203 (94.9%)	11 (5.1%)	214 (100%)
ULS-Mexico	45 (88.2%)	6 (11.8%)	51 (100%)

Table 6 shows the distribution of the participants' majors in the sample. Overall, applied sciences (27.5%) were the largest major, and social sciences (15.9%) and Business (12.5%)

followed. In addition, 6.1 percent of students reported having more than one major. The participants from TUC-Kenya (RELAF) have mostly majored in education, and the participants from ULS-France (RELEM) have mostly majored in applied sciences, which also reflects the characteristics of each school, respectively.

Table 6. Descriptive Statistics: Major

	Humanities	Social Sciences	Natural Sciences	Applied Sciences	Education	Business	Multiple Majors	Other	Total
All Institutions	77 (7.7%)	159 (15.9%)	107 (10.7%)	275 (27.5%)	76 (7.6%)	125 (12.5%)	61 (6.1%)	120 (12.0%)	1000 (100%)
BU-Palestine	21 (13.6%)	7 (4.5%)	14 (9.1%)	34 (22.1%)	11 (7.1%)	46 (29.9%)	1 (0.6%)	20 (13.0%)	154 (100%)
DLSU-Philippines	2 (1.1%)	59 (32.6%)	6 (3.3%)	23 (12.7%)	5 (2.8%)	17 (9.4%)	10 (5.5%)	59 (32.6%)	181 (100%)
SMC-USA	43 (12.6%)	89 (26.1%)	50 (14.7%)	46 (13.5%)	6 (1.8%)	62 (18.2%)	31 (9.1%)	14 (4.1%)	341 (100%)
TUC-Kenya	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (1.7%)	37 (62.7%)	0 (0.0%)	17 (28.8%)	4 (6.8%)	59 (100%)
ULS-France	0 (0.0%)	0 (0.0%)	37 (17.3%)	171 (79.9%)	0 (0.0%)	0 (0.0%)	2 (0.9%)	4 (1.9%)	214 (100%)
ULS-Mexico	11 (21.6%)	4 (7.8%)	0 (0.0%)	0 (0.0%)	17 (33.3%)	0 (0.0%)	0 (0.0%)	19 (37.3%)	51 (100%)

Table 7 presents the distribution of the participants' faith groups. Overall, Catholic appeared as the largest group (50.7%), followed by none (18.9%) and Christian, non-Catholic (14.7%). All schools' Catholic representation was the largest group, except for BU-Palestine (RELAN), where the largest group was Islamic (53.2%), followed by Christian, non-Catholic (22.1%), and Catholic (13.0%).

Table 7. Descriptive Statistics: Religion

	Catholic	Christian, Non-Catholic	Jewish	Buddhist	Hindu	Islamic	None	Other	Total
All Institutions	507 (50.7%)	147 (14.7%)	4 (0.4%)	11 (1.1%)	5 (0.5%)	92 (9.2%)	189 (18.9%)	45 (4.5%)	1000 (100%)
BU-Palestine	20 (13.0%)	34 (22.1%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	82 (53.2%)	8 (5.2%)	10 (6.5%)	154 (100%)

	Catholic	Christian, Non-Catholic	Jewish	Buddhist	Hindu	Islamic	None	Other	Total
DLSU-Philippines	143 (79.0%)	19 (10.5%)	0 (0.0%)	4 (2.2%)	0 (0.0%)	4 (2.2%)	8 (4.4%)	3 (1.7%)	181 (100%)
SMC-USA	160 (46.9%)	63 (18.5%)	3 (0.9%)	4 (1.2%)	4 (1.2%)	5 (1.5%)	78 (22.9%)	24 (7.0%)	341 (100%)
TUC-Kenya	51 (86.4%)	7 (11.9%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (1.7%)	59 (100%)
ULS-France	99 (46.3%)	21 (9.8%)	0 (0.0%)	3 (1.4%)	0 (0.0%)	1 (0.5%)	85 (39.7%)	5 (2.3%)	214 (100%)
ULS-Mexico	34 (66.7%)	3 (5.9%)	1 (2.0%)	0 (0.0%)	1 (2.0%)	0 (0.0%)	10 (19.6%)	2 (3.9%)	51 (100%)

Statistical Findings

Descriptive statistics (Means and Standard Deviations) of all the composite variables are available in Table 8. It summarizes statistics of all intuitions/countries and provides by-institution/country comparisons.

Table 8. Descriptive Statistics: Lasallian Mission Understanding, Lasallian Mission Value, Academic Impact, Spiritual Impact, Social Impact, and Career Impact

Variables		**LMU**	**LMV**	**AcIm**	**SpIm**	**SoIm**	**CaIm**
All Institutions	n	1000	1000	1000	1000	1000	1000
	M	2.96	3.01	2.57	2.59	2.83	2.37
	SD	0.6	0.64	0.73	0.83	0.71	0.74
BU-Palestine	n	154	154	154	154	154	154
	M	2.77	2.84	2.49	2.6	2.82	2.42
	SD	0.49	0.5	0.56	0.58	0.55	0.51
DLSU-Philippines	n	181	181	181	181	181	181
	M	3.16	3.15	2.76	2.99	3.13	2.62
	SD	0.5	0.62	0.62	0.69	0.59	0.7
SMC-USA	n	341	341	341	341	341	341
	M	2.91	2.96	2.4	2.46	2.67	2.24
	SD	0.55	0.63	0.69	0.83	0.72	0.73

Variables		LMU	LMV	AcIm	SpIm	SoIm	CaIm
TUC-Kenya	n	59	59	59	59	59	59
	M	3.29	3.31	3.24	3.25	3.34	2.97
	SD	0.6	0.61	0.57	0.55	0.5	0.57
ULS-France	n	214	214	214	214	214	214
	M	2.88	2.95	2.44	2.2	2.63	2.05
	SD	0.71	0.7	0.83	0.89	0.77	0.74
ULS-Mexico	n	51	51	51	51	51	51
	M	2.97	3.3	3.05	2.86	3.12	2.8
	SD	0.72	0.65	0.82	0.95	0.78	0.8

Note. BU-Palestine = Bethlehem University, Palestine (RELAN); DLSU-Philippines = De La Salle University, Manila, Philippines (PARC); SMC-USA = Saint Mary's College of California, Moraga, USA (RELAN); TUC-Kenya = Tangaza University College, Nairobi, Kenya (RELAF); ULS-France = UniLaSalle, Beauvais, France (RELEM); ULS-Mexico = Universidad La Salle, Mexico City, Mexico (RELAL); M = Mean; SD = Standard Deviation; LMU = Lasallian Mission Understanding; LMV = Lasallian Mission Value; AcIm = Academic Impact; SpIm = Spiritual Impact; SoIm = Social Impact; CaIm = Career Impact.

Table 9. Correlations: All Institutions/Countries

Variable	1	2	3	4	5	6
1.LMU	-					
2.LMV	.58***	-				
3.AcIm	.56***	.63***	-			
4.SpIm	.48***	.60***	.68***	-		
5.SoIm	.55***	.58***	.69***	.73***	-	
6.CaIm	.43***	.51***	.70***	.66***	.64***	-

Note. LMU = Lasallian Mission Understanding; LMV = Lasallian Mission Value; AcIm = Academic Impact; SpIm = Spiritual Impact; SoIm = Social Impact; CaIm = Career Impact.
***$p < .001$, two-tailed.

The results from correlation analysis are shown in Table 9 (All Institutions/Countries), Table 10 (BU-Palestine (RELAN)), Table 11 (DLSU-Philippines (PARC)), Table 12 (SMC-USA

(RELAN)), Table 13 (TUC-Kenya (RELAF)), Table 14 (ULS-France (RELEM)), and Table 15 (ULS-Mexico (RELAL)). In addition, histograms (Figures 1-6) show that model assumptions are met, and variables are normally distributed.

Table 10. Correlations: Bethlehem University, Palestine (RELAN)

Variable	1	2	3	4	5	6
1.LMU	-					
2.LMV	.52***	-				
3.AcIm	.42***	.42***	-			
4.SpIm	.52***	.58***	.59***	-		
5.SoIm	.54***	.48***	.53***	.65***	-	
6.CaIm	.27**	.31***	.52***	.37***	.37***	-

Note. LMU = Lasallian Mission Understanding; LMV = Lasallian Mission Value; AcIm = Academic Impact; SpIm = Spiritual Impact; SoIm = Social Impact; CaIm = Career Impact. **$p < .01$. ***$p < .001$, two-tailed.

Table 11. Correlations: De La Salle University, Manila, Philippines (PARC)

Variable	1	2	3	4	5	6
1.LMU	-					
2.LMV	.61***	-				
3.AcIm	.45***	.54***	-			
4.SpIm	.36***	.54***	.63***	-		
5.SoIm	.49***	.57***	.66***	.66***	-	
6.CaIm	.37***	.50***	.72***	.60***	.59***	-

Note. LMU = Lasallian Mission Understanding; LMV = Lasallian Mission Value; AcIm = Academic Impact; SpIm = Spiritual Impact; SoIm = Social Impact; CaIm = Career Impact. ***$p < .001$, two-tailed.

Table 12. Correlations: Saint Mary's College of California, USA (RELAN)

Variable	1	2	3	4	5	6
1.LMU	-					
2.LMV	.50***	-				
3.AcIm	.52***	.58***	-			

Variable	1	2	3	4	5	6
4.SpIm	.47***	.58***	.62***	-		
5.SoIm	.51***	.52***	.67***	.72***	-	
6.CaIm	.44***	.51***	.69***	.63***	.68***	-

Note. LMU = Lasallian Mission Understanding; LMV = Lasallian Mission Value; AcIm = Academic Impact; SpIm = Spiritual Impact; SoIm = Social Impact; CaIm = Career Impact.
***$p < .001$, two-tailed.

Table 13. Correlations: Tangaza University College, Nairobi, Kenya (RELAF)

Variable	1	2	3	4	5	6
1.LMU	-					
2.LMV	.62***	-				
3.AcIm	.58***	.58***	-			
4.SpIm	.62***	.68***	.71***	-		
5.SoIm	.62***	.50***	.59***	.65***	-	
6.CaIm	.47***	.52***	.71***	.65***	.46***	-

Note. LMU = Lasallian Mission Understanding; LMV = Lasallian Mission Value; AcIm = Academic Impact; SpIm = Spiritual Impact; SoIm = Social Impact; CaIm = Career Impact.
***$p < .001$, two-tailed.

Table 14. Correlations: UniLaSalle, Beauvais, France (RELEM)

Variable	1	2	3	4	5	6
1.LMU	-					
2.LMV	.60***	-				
3.AcIm	.61***	.74***	-			
4.SpIm	.46***	.66***	.72***	-		
5.SoIm	.56***	.63***	.67***	.69***	-	
6.CaIm	.43***	.51***	.64***	.61***	.54***	-

Note. LMU = Lasallian Mission Understanding; LMV = Lasallian Mission Value; AcIm = Academic Impact; SpIm = Spiritual Impact; SoIm = Social Impact; CaIm = Career Impact.
***$p < .001$, two-tailed.

Table 15. Correlations: Universidad La Salle, Mexico (RELAL)

Variable	1	2	3	4	5	6
1.LMU	-					
2.LMV	.63***	-				
3.AcIm	.64***	.72***	-			
4.SpIm	.47***	.53***	.74***	-		
5.SoIm	.63***	.78***	.80***	.70***	-	
6.CaIm	.47***	.64***	.79***	.83***	.77***	-

Note. LMU = Lasallian Mission Understanding; LMV = Lasallian Mission Value; AcIm = Academic Impact; SpIm = Spiritual Impact; SoIm = Social Impact; CaIm = Career Impact.
***$p < .001$, two-tailed.

Results of Research Question 1

The Relationship between Lasallian Mission Understanding and Lasallian Mission Value

Research Question 1 examined the relationship between Lasallian Mission Understanding and Lasallian Mission Value. For the examination, three things were investigated: (a) composite variable for students' understanding of the institutional mission, "Lasallian Mission Understanding;" (b) composite variable for students' valuing of the institutional mission, "Lasallian Mission Value;" and (c) the correlation between (a) and (b).

Research Question 1-a: To what extent do the students at Lasallian institutions of higher education perceive that they understand the Lasallian mission?

Research Question 1-a investigated the students' perceptions of their understanding of Lasallian mission of the school. Table 8 displays the summary statistics for Lasallian Mission Understanding across institutions/countries (minimum = 1, maximum = 4, M = 2.96, SD = .60). Table 8 also displays the average Lasallian Mission Understanding of students at each institution/country (BU-Palestine: M = 2.77, SD = 0.49; DLSU-Philippines: M = 3.16, SD = .50; SMC-USA: M = 2.91, SD = .55; TUC-Kenya: M = 3.29, SD = 0.60; ULS-France: M = 2.88, SD = .71; ULS-Mexico: M = 2.97, SD = .72).

Figure 1 provides percentage distribution of responses of all institutions/countries on

Lasallian Mission Understanding. These descriptive statistics and histogram indicate that many students (79.7%) perceive that they understand the Lasallian mission of their institutions, though they vary in that understanding.

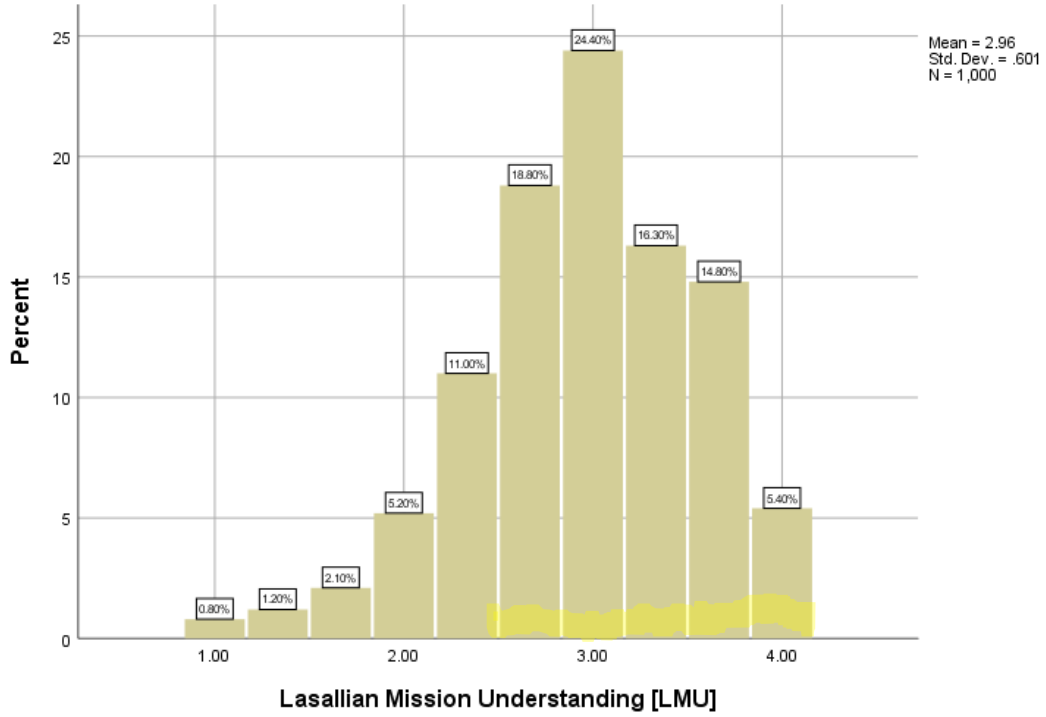


Figure 1. Percentage of student responses of all institutions on Lasallian Mission Understanding

Research Question 1-b: To what extent do the students at Lasallian institutions of higher education perceive that the Lasallian mission is of personal value to them?

Next, Research Question 1-b examined students' perceptions that the Lasallian mission is of personal value to them. As Table 8 displays, the average Lasallian Mission Value of students in this sample (all institutions/countries) is 3.01 (minimum = 1, maximum = 4), with a standard deviation of 0.64. The average Lasallian Mission Value of students at each institution /country is also displayed (BU-Palestine: M = 2.84, SD = .50; DLSU-Philippines: M = 3.15, SD = .62; SMC-USA: M = 2.96, SD = .63; TUC-Kenya: M = 3.31, SD = .61; ULS-France: M = 2.95, SD = .70; ULS-Mexico: M = 3.30, SD = .65).

The histogram of Lasallian Mission Value is available in Figure 2 (all institutions/ countries). The descriptive statistics and histogram show that the vast majority of participants (80.3%)

placed high value on the Lasallian mission and that students vary in their valuing for the Lasallian mission; few participants (19.7%) placed low value on the mission.

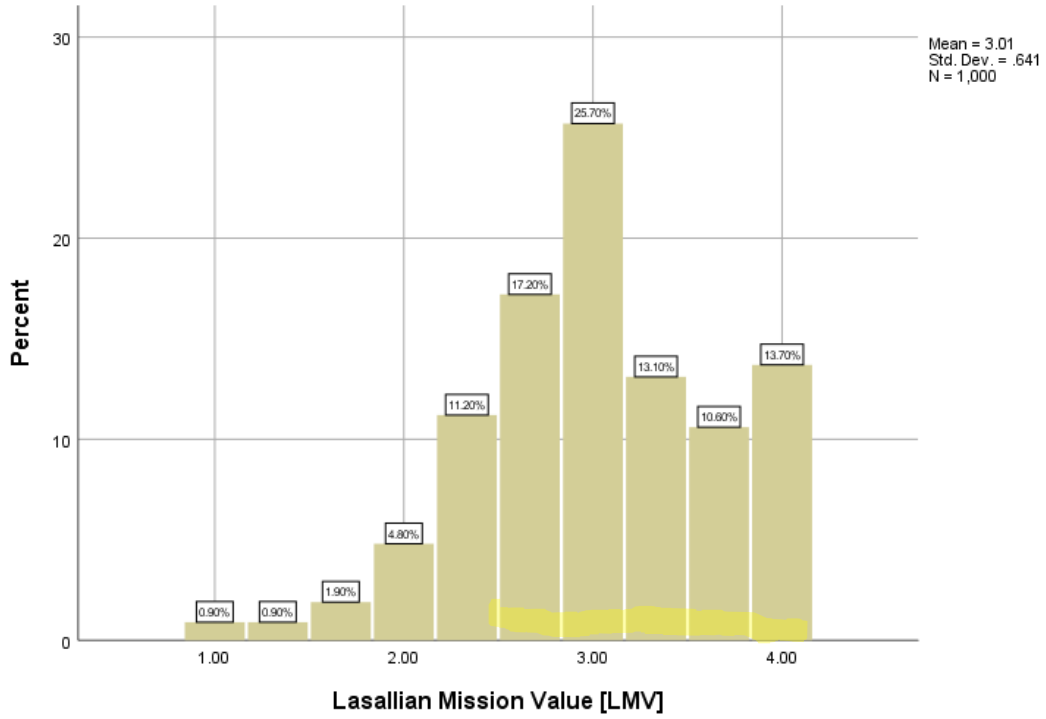


Figure 2. Percentage of student responses of all institutions on Lasallian Mission Value

Research Question 1-c: Is there a correlation between Lasallian Mission Understanding and Lasallian Mission Value?

Research Question 1-c examined the relationship between Lasallian Mission Understanding and Lasallian Mission Value. Lasallian Mission Understanding was significantly and positively associated with Lasallian Mission Value across institutions/countries. As shown in Table 9, there was an overall significant correlation (all institutions/countries: $r = .58$, $p < .001$) between Lasallian Mission Understanding and Lasallian Mission Value, at the 0.001 level. All six institutions/countries report significant correlations between Lasallian Mission Understanding and Lasallian Mission Value (BU-Palestine: $r = .52$, $p < .001$ (Table 10); DLSU-Philippines: $r = .61$, $p < .001$ (Table 11); SMC-USA: $r = .50$, $p < .001$ (Table 12); TUC-Kenya: $r = .62$, $p < .001$ (Table 13); ULS-France: $r = .60$, $p < .001$ (Table 14); ULS-Mexico: $r = .63$, $p < .001$ (Table 15)).

The findings indicate that students who show a high understanding of the Lasallian mission

of their institutions report placing a high personal value on the mission. That is, the more students understand the Lasallian mission, the more students value the mission. The result confirms that Lasallian Mission Understanding is predictive of Lasallian Mission Value.

Results of Research Question 2

The relationship between Lasallian Mission Value and Lasallian Mission Impact

Research Question 2 investigated the relationship between Lasallian Mission Value and each of the four types of Lasallian Mission Impact—Academic Impact, Spiritual Impact, Social Impact, and Career Impact. To investigate the relationship between Lasallian Mission Value and Lasallian Mission Impact, three steps were taken: (a) examining the four variables of Lasallian Mission Impact; (b) discovering the correlations between Lasallian Mission Value and each Lasallian Mission Impact; and (c) comparing the correlations discovered.

Research Question 2-a: To what extent do the students at Lasallian institutions of higher education perceive that the Lasallian mission impacts their academic, spiritual, social and/or career development?

Research question 2-a examined students' perceptions regarding the impact of the Lasallian mission on their holistic development. First, the composite variable for the impact of the Lasallian mission on students' academic development, "Academic Impact," was examined.

As shown in Table 8, overall (all institutions/countries), the average impact of the Lasallian mission on students' academic development [Academic Impact] in this sample is 2.57 (minimum = 1, maximum = 4), with a standard deviation of 0.73. Table 8 also displays the average Academic Impact on students who are attending each institution (BU-Palestine: M = 2.49, SD = .56; DLSU-Philippines: M = 2.76, SD = .62; SMC-USA: M = 2.40, SD = .69; TUC-Kenya: M = 3.24, SD = .57; ULS-France: M = 2.44, SD = .83; ULS-Mexico: M = 3.05, SD = .82).

Figure 3 provides percentage distribution of students' scores of all institutions/countries on Academic Impact. The findings indicate that slightly more students reported high impact of the mission on their academic development (55.3%) than students who reported the contrary

(44.7%).

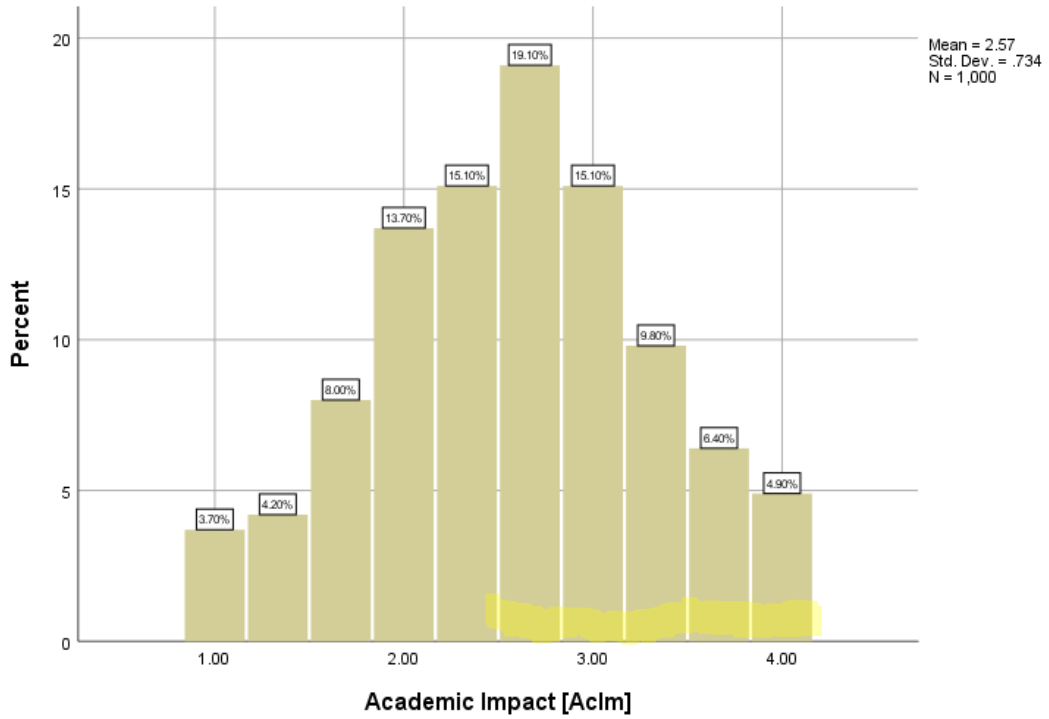


Figure 3. Percentage of student responses of all institutions on Academic Impact

The second examination was of the composite variable for the impact of the Lasallian mission on students' spiritual development, "Spiritual Impact." Table 8 shows that, overall (all institutions/countries), the average impact of the Lasallian mission on students' spiritual development [Spiritual Impact] in this sample is 2.59 (minimum = 1, maximum = 4), with a standard deviation of 0.83. The average Spiritual Impact on students at each institution/country is also reported in Table 8 (BU-Palestine: M = 2.60, SD = .58; DLSU-Philippines: M = 2.99, SD = .69; SMC-USA: M = 2.46, SD = .83; TUC-Kenya: M = 3.25, SD = .55; ULS-France: M = 2.20, SD = .89; ULS-Mexico: M = 2.86, SD = .95).

Figure 4 displays percentage distribution of responses of all institutions/countries on Spiritual Impact. The findings indicate that more students reported high impact of the mission on their spiritual development (58.0%) than did students who reported otherwise (42.0%).

The third examination was of the composite variable for the impact of the Lasallian mission on students' social development, "Social Impact." Table 8 shows that, overall (all institutions/countries), the average impact of the Lasallian mission on students' social

development [Social Impact] in this sample is 2.83 (minimum = 1, maximum = 4), with a standard deviation of 0.71. The average Social Impact on students at each institution/country is also shown in Table 8 (BU-Palestine: M = 2.82, SD = .55; DLSU-Philippines: M = 3.13, SD = .59; SMC-USA: M = 2.67, SD = .72; TUC-Kenya: M = 3.34, SD = .50; ULS-France: M = 2.63, SD = .77; ULS-Mexico: M = 3.12, SD = .78).

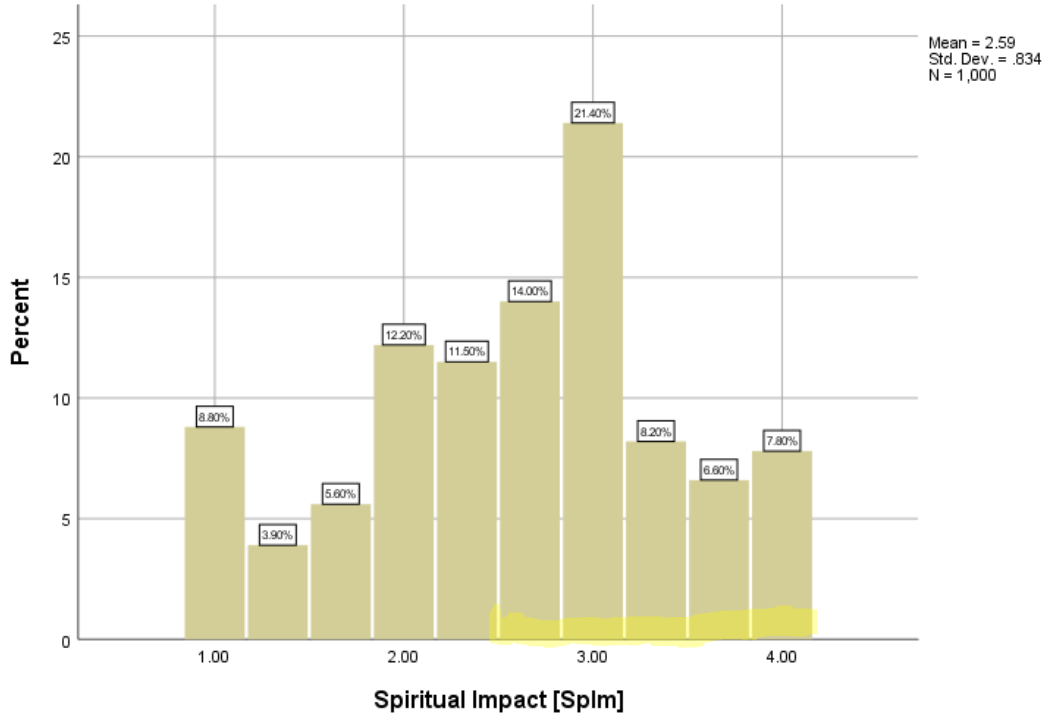


Figure 4. Percentage of student responses of all institutions on Spiritual Impact

Figure 5 shows percentage distribution of responses across institutions/countries on Social Impact. The findings indicate that a vast majority of students (69.5%) reported that the Lasallian mission had high impact on their social development.

The fourth examination was of the composite variable for the impact of the Lasallian mission on students' career development, "Career Impact." As shown in Table 8, overall (all institutions/countries), the average impact of the Lasallian mission on students' career development [Career Impact] in this sample is 2.37 (minimum = 1, maximum = 4), with a standard deviation of 0.74. Table 8 also shows the average Career Impact on students at each institution/country (BU-Palestine: M = 2.42, SD = .51; DLSU-Philippines: M = 2.62, SD = .70; SMC-USA: M = 2.24, SD = .73; TUC-Kenya: M = 2.97, SD = .57; ULS-France: M = 2.05, SD = .74; ULS-Mexico: M = 2.80, SD = .80).

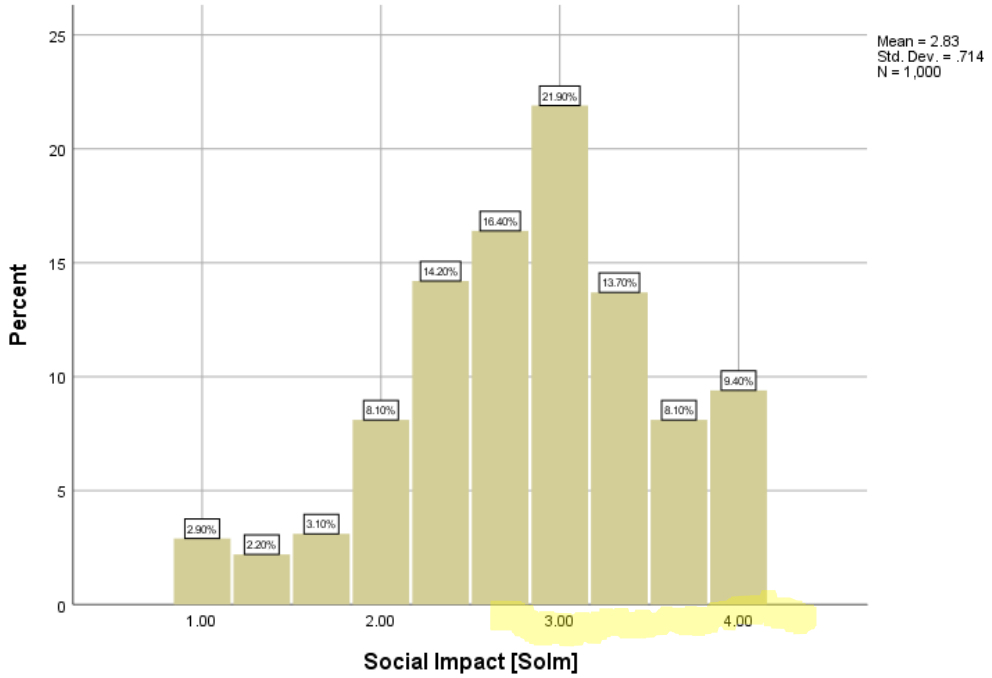


Figure 5. Percentage of student responses of all institutions on Social Impact

Figure 6 presents percentage distribution of responses of all institutions/countries on Career Impact. More students reported low impact of the mission on their career development (56.6%) than did students who reported otherwise (43.4%).

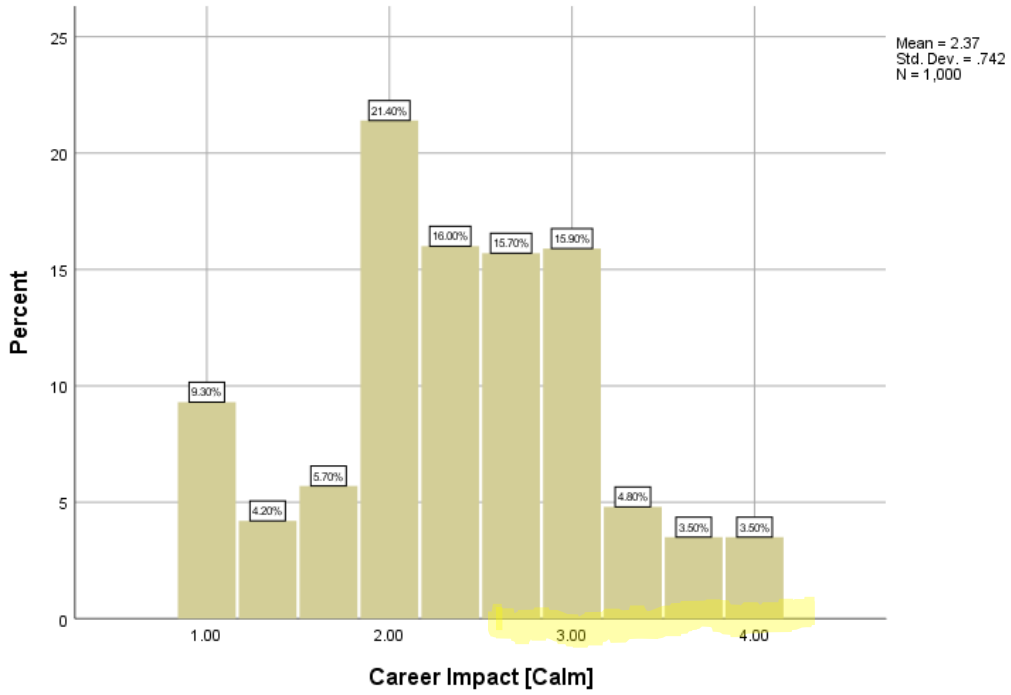


Figure 6. Percentage of student responses of all institutions on Career Impact

In summary, among the four types of Lasallian mission impact, students perceive the highest impact of the Lasallian mission on their social development [Social Impact] (M = 2.83, SD = .71). The students' perceptions of the Lasallian mission impact on their spiritual development [Spiritual Impact] (M = 2.59, SD = .83), academic development [Academic Impact] (M = 2.57, SD = .73) and career development [Career Impact] (M = 2.37, SD = .74) follow. A majority of students reported high Academic (55.3%), Spiritual (58.0%) and Social Impact (69.5%), whereas a majority of students reported low Career Impact (56.6%).

At BU-Palestine, students reported Social Impact at the highest value (M = 2.82, SD = .55), followed by Spiritual Impact (M = 2.60, SD = .58), Academic Impact (M = 2.49, SD = .56), and Career Impact (M = 2.42, SD = .51). At DLSU-Philippines, students reported the same order: Social Impact (M = 3.13, SD = .59), Spiritual Impact (M = 2.99, SD = .69), Academic Impact (M = 2.76, SD = .62), and Career Impact (M = 2.62, SD = .70). At SMC-USA, students reported the same order, Social Impact (M = 2.67, SD = .72), Spiritual Impact (M = 2.46, SD = .83), Academic Impact (M = 2.40, SD = .69), and Career Impact (M = 2.24, SD = .73). At TUC-Kenya, students likewise reported Social Impact (M = 3.34, SD = .50), followed by Spiritual Impact (M = 3.25, SD = .55), Academic Impact (M = 3.24, SD = .57) and Career Impact (M = 2.97, SD = .57). The students at ULS-France reported a slightly different value order: Social Impact (M = 2.63, SD = .77), followed by Academic Impact (M = 2.44, SD = .83), Spiritual Impact (M = 2.20, SD = .89), and Career Impact (M = 2.05, SD = .74). Students at ULS-Mexico, report the same order as the students at ULS-France: Social Impact (M = 3.12, SD = .78), Academic Impact (M = 3.05, SD = .82), Spiritual Impact (M = 2.86, SD = .95), and Career Impact (M = 2.80, SD = .80).

Research Question 2-b: Are there correlations between Lasallian Mission Value and the four types of Lasallian Mission Impact (Academic Impact, Spiritual Impact, Social Impact and Career Impact)?

First, to learn the relationship between Lasallian Mission Value and Lasallian Mission Impact on students' academic development [Academic Impact], correlation analysis was performed. The statistically significant and positive linear relationships between Lasallian Mission Value and Academic Impact was discovered in general (all institutions/countries: $r = .63$, $p < .001$) (Table 9). Also, the findings indicate that Lasallian Mission Value is positively associated

with Academic Impact in all six institutions/countries (BU-Palestine: $r = .42$, $p < .001$ (Table 10); DLSU-Philippines: $r = .54$, $p < .001$ (Table 11); SMC-USA: $r = .58$, $p < .001$ (Table 12); TUC-Kenya: $r = .58$, $p < .001$ (Table 13); ULS-France: $r = .74$, $p < .001$ (Table 14); ULS-Mexico: $r = .72$, $p < .001$ (Table 15)). The results confirm that Lasallian Mission Value is predictive of Academic Impact. That is, students who place a high value on the Lasallian mission of their institutions in this sample report a high mission impact on their academic development.

Regarding the relationship between Lasallian Mission Value and Lasallian Mission Impact on students' spiritual development [Spiritual Impact], the findings indicate that Lasallian Mission Value is positively associated with Spiritual Impact. Students who place a high value on the Lasallian mission report a high impact on their spiritual development. Table 9 provides the correlation coefficient (all institutions/countries: $r = .60$, $p < .001$) between Lasallian Mission Value and Spiritual Impact in general. And all six institutions/countries report the statistically significant and positive relationship between Lasallian Mission Value and Spiritual Impact (BU-Palestine: $r = .58$, $p < .001$ (Table 10); DLSU-Philippines: $r = .54$, $p < .001$ (Table 11); SMC-USA: $r = .58$, $p < .001$ (Table 12); TUC-Kenya: $r = .68$, $p < .001$ (Table 13); ULS-France: $r = .66$, $p < .001$ (Table 14); ULS-Mexico: $r = .53$, $p < .001$ (Table 15)). The results confirm that Lasallian Mission Value is predictive of Spiritual Impact.

Concerning the relationship between Lasallian Mission Value and Lasallian Mission Impact on students' social development [Social Impact], the findings indicate that Lasallian Mission Value is positively associated with Social Impact (all institutions/countries: $r = .58$, $p < .001$) in general (Table 9). Students who place a high value on the Lasallian mission report a high impact on their social development. All six institutions/countries display the positive linear relationships between Lasallian Mission Value and Social Impact (BU-Palestine: $r = .48$, $p < .001$ (Table10); DLSU-Philippines: $r = .57$, $p < .001$ (Table 11); SMC-USA: $r = .52$, $p < .001$ (Table 12); TUC-Kenya: $r = .50$, $p < .001$ (Table 13); ULS-France: $r = .63$, $p < .001$ (Table 14); ULS-Mexico: $r = .78$, $p < .001$ (Table 15)). The results confirm that Lasallian Mission Value is predictive of Social Impact.

With respect to the relationship between Lasallian Mission Value and Lasallian Mission Impact on students' career development [Career Impact], the findings indicate that Lasallian Mission Value is also positively associated with Career Impact. That is, students who place

high value on the Lasallian mission report high impact on their career development. Table 9 provides the correlation coefficient (all institutions/countries: $r = .51$, $p < .001$) between Lasallian Mission Value and Career Impact in general. All six institutions/countries report statistically significant correlations (BU-Palestine: $r = .31$, $p < .001$ (Table 10); DLSU-Philippines: $r = .50$, $p < .001$ (Table 11); SMC-USA: $r = .51$, $p < .001$ (Table 12); TUC-Kenya: $r = .52$, $p < .001$ (Table 13); ULS-France: $r = .51$, $p < .001$ (Table 14); ULS-Mexico: $r = .64$, $p < .001$ (Table 15)). The results confirm that Lasallian Mission Value is predictive of Career Impact.

Research Question 2-c: If so, which type of Lasallian Mission Impact has the strongest correlation?

The results reveal the strongest correlation between Lasallian Mission Value and Academic Impact. Table 9 provides correlations of all six composite variables, such as Lasallian Mission Understanding, Lasallian Mission Value, Academic Impact. Spiritual Impact, Social Impact, and Career Impact. And Tables 10 to15 provide correlations of each school. In summary, the findings indicate that students who place high value on the Lasallian mission of their institutions report high impact on their academic development (correlation coefficient $r = .63$, $p < .001$), spiritual development ($r = .60$, $p < .001$), social development ($r = .58$, $p < .001$) and career development ($r = .51$, $p < .001$).

At BU-Palestine, the strongest correlation was found between Lasallian Mission Value and Spiritual Impact ($r = .58$, $p < .001$). Social Impact ($r = .48$, $p < .001$), Academic Impact ($r = .42$, $p < .001$), and Career Impact ($r = .31$, $p < .001$) followed. DLSU-Philippines, displayed the strongest relationship between Lasallian Mission Value and Social Impact ($r = .57$, $p < .001$), followed by Spiritual Impact ($r = .54$, $p < .001$), Academic Impact ($r = .54$, $p < .001$) and Career Impact ($r = .50$, $p < .001$), in that order (spiritual impact $r = .544$, academic impact $r = .543$). SMC-USA, displayed the strongest relationship between Lasallian Mission Value and Academic Impact ($r = .58$, $p < .001$) (academic impact $r = .579$, spiritual impact $r = .575$). Spiritual Impact ($r = .58$, $p < .001$), Social Impact ($r = .58$, $p < .001$), and Career Impact ($r = .58$, $p < .001$) then followed. At TUC-Kenya, the strongest correlation was found between Lasallian Mission Value and Spiritual Impact ($r = .68$, $p < .001$), followed by Academic Impact ($r = .58$, $p < .001$), Career Impact ($r = .52$, $p < .001$), and Social Impact (r

= .50, $p < .001$). At ULS-France, the correlation between Lasallian Mission Value and Academic Impact ($r = .74$, $p < .001$) appeared as the strongest. Next came Spiritual Impact ($r = .66$, $p < .001$), Social Impact ($r = .63$, $p < .001$), and Career Impact ($r = .51$, $p < .001$). At ULS-Mexico, Lasallian Mission Value and Social Impact ($r = .78$, $p < .001$) displayed the strongest correlation. Academic Impact ($r = .72$, $p < .001$), Career Impact ($r = .64$, $p < .001$), and Spiritual Impact ($r = .53$, $p < .001$) followed.

Overall, statistically significant, and positive correlations, a 2-tailed significance of 0.001, were found between Lasallian Mission Value and Lasallian Mission Impact (Academic Impact, Spiritual Impact, Social Impact, and Career Impact). The statistical findings indicate that Lasallian Mission Value is positively associated with all four types of Lasallian Mission Impact on student development and confirm the hypothesis that Lasallian Mission Value is predictive of Lasallian Mission Impact. The strongest correlation was found between Lasallian Mission Value and Academic Impact (all institutions/countries: $r = .63$, $p < .001$), then Spiritual Impact ($r = .60$, $p < .001$), Social Impact ($r = .58$, $p < .001$), and Career Impact ($r = .51$, $p < .001$) followed in order.

Results of Research Question 3

The relationships between Lasallian Mission Value, Previous Lasallian Education Experience, and Lasallian Mission Impact

Research Question 3 explored the relationships between Lasallian Mission Value, Previous Lasallian Education Experience, and Lasallian Mission Impact—Academic Impact, Spiritual Impact, Social Impact, and Career Impact. For this exploration, two relationships were examined: (a) the relationship between Lasallian Mission Value and having Previous Lasallian Education Experience; and (b) the relationship between each Lasallian Mission Impact (Academic Impact, Spiritual Impact, Social Impact, and Career Impact) and having Previous Lasallian Education Experience, when controlling for Lasallian Mission Value.

Research Question 3-a: What is the relationship between Lasallian Mission Value and having Previous Lasallian Education Experience?

Out of 1,000 participants in the sample, 64 percent of students had no previous Lasallian education experience, while 36 percent of them previously attended Lasallian schools. Table

16 shows the descriptive statistics of previous Lasallian education experience by institution/country as well as in total. All institutions in this sample had more participants without previous Lasallian education experience than they did students with such experience, except for ULS-France. At UniLaSalle, Beauvais, 68 percent of the participants previously attended Lasallian school(s).

Table 16. Descriptive Statistics: Previous Lasallian Education Experience

	No Previous Lasallian Education Experience	Previous Lasallian Education Experience	Total
All Institutions	637 (63.7%)	363 (36.3%)	1000 (100%)
BU-Palestine	106 (68.8%)	48 (31.2%)	154 (100%)
DLSU-Philippines	112 (61.9%)	69 (38.1%)	181 (100%)
SMC-USA	280 (82.1%)	61 (17.9%)	341 (100%)
TUC-Kenya	41 (69.5%)	18 (30.5%)	59 (100%)
ULS-France	69 (32.2%)	145 (67.8%)	214 (100%)
ULS-Mexico	29 (56.9%)	22 (43.1%)	51 (100%)

Note. BU-Palestine = Bethlehem University, Palestine (RELAN); DLSU-Philippines = De La Salle University, Manila, Philippines (PARC); SMC-USA = Saint Mary's College of California, Moraga, USA (RELAN); TUC-Kenya = Tangaza University College, Nairobi, Kenya (RELAF); ULS-France = UniLaSalle, Beauvais, France (RELEM); ULS-Mexico = Universidad La Salle, Mexico City, Mexico (RELAL)

Regression analysis was employed to examine the relationship between the outcome variable (Lasallian Mission Value) and having Previous Lasallian Education Experience (yes/no),

performing the test at the alpha level 0.05. Table 17 shows that Previous Lasallian Education Experience had no statistically significant effect on Lasallian Mission Value: all institutions/countries (p = .21); BU-Palestine (p = .09); DLSU-Philippines (p = .57); SMC-USA (p = .12); TUC-Kenya (p = .60); ULS-France (p = .28); and ULS-Mexico (p = .11). The p values are bigger than the alpha level ($p > .05$).

Table 17. Regression of Lasallian Mission Value on Previous Lasallian Education Experience

	All Institutions Model1 β	BU-Palestine Model1 β	DLSU-Philippines Model1 β	SMC-USA Model1 β	TUC-Kenya Model1 β	ULS-France Model1 β	ULS-Mexico Model1 β
Previous	.04	.14	.04	.08	−.07	−.07	.23
R^2	.00	.02	.00	.01	.01	.01	.05

Note. BU-Palestine = Bethlehem University, Palestine (RELAN); DLSU-Philippines = De La Salle University, Manila, Philippines (PARC); SMC-USA = Saint Mary's College of California, Moraga, USA (RELAN); TUC-Kenya = Tangaza University College, Nairobi, Kenya (RELAF); ULS-France = UniLaSalle, Beauvais, France (RELEM); ULS-Mexico = Universidad La Salle, Mexico City, Mexico (RELAL); Previous = Previous Lasallian Education Experience

This finding indicates that Lasallian Mission Value is not statistically significantly related to the Previous Lasallian Education Experience group. Students with previous Lasallian education experience did not show more (or less) value for the Lasallian mission than students who didn't have previous Lasallian education experience (all institutions/countries, $p > .05$; BU-Palestine, $p > .05$; DLSU-Philippines, $p > .05$; SMC-USA, $p > .05$, TUC-Kenya, $p > .05$; ULS-France, $p > .05$; ULS-Mexico, $p > .05$).

Research Questions 3-b: What is the relationship between each Lasallian Mission Impact (Academic Impact, Spiritual Impact, Social Impact, and Career Impact) and Previous Lasallian Education Experience, when controlling for Lasallian Mission Value?

To explore the relationship between Lasallian Mission Impact and having Previous Lasallian

Education Experience, controlling for Lasallian Mission Value, regression analyses were performed at the alpha level 0.05. Table 18 shows the results of regression of Academic Impact on Lasallian Mission Value and Previous Lasallian Education Experience. In Model 1, Academic Impact was regressed on Lasallian Mission Value. In Model 2, Academic Impact was regressed on Lasallian Mission Value and Previous Lasallian Education Experience.

Table 18. Regression of Academic Impact on Lasallian Mission Value and Previous Lasallian Education Experience

		LMV	Previous	R^2
All Institutions	M1β	.63***	--	0.39
	M2β	.63***	0.03	0.39
BU-Palestine	M1β	.42***	--	0.17
	M2β	.42***	0	0.17
DLSU-Philippines	M1β	.54***	--	0.3
	M2β	.54***	0.04	0.3
SMC-USA	M1β	.58***	--	0.34
	M2β	.57***	.09*	0.34
TUC-Kenya	M1β	.58***	--	0.34
	M2β	.60***	.21*	0.38
ULS-France	M1β	.74***	--	0.55
	M2β	.74***	0.02	0.55
ULS-Mexico	M1β	.72***	--	0.52
	M2β	.77***	-0.2	0.56

Note. BU-Palestine = Bethlehem University, Palestine (RELAN); DLSU-Philippines = De La Salle University, Manila, Philippines (PARC); SMC-USA = Saint Mary's College of California, Moraga, USA (RELAN); TUC-Kenya = Tangaza University College, Nairobi, Kenya (RELAF); ULS-France = UniLaSalle, Beauvais, France (RELEM); ULS-Mexico = Universidad La Salle, Mexico City, Mexico (RELAL); M1β = Model 1 β; M2β = Model 2 β; LMV = Lasallian Mission Value; Previous = Previous Lasallian Education Experience

*$p < .05$. ***$p < .001$.

First, regression model 1 included Lasallian Mission Value as a predictor of Academic

Impact. As shown in Table 18, Lasallian Mission Value had a statistically significant effect on Academic Impact in all institutions/countries (β = .63, $p < .001$). Overall, for every one-unit increase in Lasallian Mission Value (1 Standard Deviation), there was a 0.63 average increase in Academic Impact. R-squared was significant: Lasallian Mission Value explained 39 percent of the variance in Academic Impact. At all six participating institutions, Lasallian Mission Value had a statistically significant effect on Academic Impact (BU-Palestine: β = .42, $p < .001$; DLSU, Philippines: β = .54, $p < .001$; SMC-USA: β = .58, $p < .001$; TUC-Kenya: β = .58, $p < .001$; ULS-France: β = .74, $p < .001$; ULS-Mexico: β = .72, $p < .001$).

In the second model, Previous Lasallian Education Experience was added as a second predictor of Academic Impact. Overall, for all institutions/countries, the effect of Lasallian Mission Value remained the same (β = .63, $p < .001$), and Previous Lasallian Education Experience had no statistically significant effect on Academic Impact, when controlling for Lasallian Mission Value (β = .03, $p > .05$). Among six institutions/countries, four show that Academic Impact is not statistically significantly related to Previous Lasallian Education Experience (BU-Palestine, $p > .05$; DLSU-Philippines, $p > .05$; ULS-France, $p > .05$; ULS-Mexico, $p > .05$). Two institutions/countries report otherwise.

At SMC-USA, Lasallian Mission Value had a statistically significant effect on Academic Impact (β = .58, $p < .001$) in regression model 1. In model 2, while the effect of Lasallian Mission Value remained approximately the same (β = .57, $p < .001$), Previous Lasallian Education Experience had a statistically significant effect on Academic Impact, when controlling for Lasallian Mission Value (β = .09, $p < .05$). That is, students who attended Lasallian schools previously had a 0.09 average higher Academic Impact relative to students who did not, even when taking into account Lasallian Mission Value. R-squared remained the same. Also, at TUC-Kenya, the effect of Lasallian Mission Value increased (Model 1: β = .58, $p < .001$; Model 2: β = .60, $p < .001$). Previous Lasallian Education Experience had a statistically significant effect on Academic Impact, when controlling for Lasallian Mission Value (β = .21, $p < .05$). Students who had prior Lasallian education experience reported a 0.21 average higher Academic Impact relative to students who did not, when considering Lasallian Mission Value. Adding Previous Lasallian Education Experience to the model added an additional 4 percent variance in explaining Academic Impact (Model 1: $R^2 = .34$; Model 2: $R^2 = .38$).

Table 19 provides the results from the regression analysis of Spiritual Impact. In Model 1,

Spiritual Impact was regressed on Lasallian Mission Value. In Model 2, Spiritual Impact was regressed on Lasallian Mission Value and Previous Lasallian Education Experience.

Table 19. Regression of Spiritual Impact on Lasallian Mission Value and Previous Lasallian Education Experience

		LMV	Previous	R^2
All Institutions	M1β	.60***	--	0.36
	M2β	.60***	-0.04	0.36
BU-Palestine	M1β	.58***	--	0.34
	M2β	.60***	-0.12	0.35
DLSU-Philippines	M1β	.54***	--	0.3
	M2β	.55***	-0.02	0.3
SMC-USA	M1β	.58***	--	0.33
	M2β	.57***	.10*	0.34
TUC-Kenya	M1β	.68***	--	0.46
	M2β	.69***	0.15	0.49
ULS-France	M1β	.66***	--	0.44
	M2β	.67***	0.07	0.45
ULS-Mexico	M1β	.53***	--	0.28
	M2β	.59***	-.28*	0.36

Note. BU-Palestine = Bethlehem University, Palestine (RELAN); DLSU-Philippines = De La Salle University, Manila, Philippines (PARC); SMC-USA = Saint Mary's College of California, Moraga, USA (RELAN); TUC-Kenya = Tangaza University College, Nairobi, Kenya (RELAF); ULS-France = UniLaSalle, Beauvais, France (RELEM); ULS-Mexico = Universidad La Salle, Mexico City, Mexico (RELAL); M1β = Model 1 β; M2β = Model 2 β; LMV = Lasallian Mission Value; Previous = Previous Lasallian Education Experience

*$p < .05$. ***$p < .001$.

In the first model, Lasallian Mission Value was included as a predictor of Spiritual Impact. Lasallian Mission Value had a statistically significant effect on Spiritual Impact across institutions (all institutions/countries: β = .60, $p < .001$; BU-Palestine: β = .58, $p < .001$; DLSU, Philippines: β = .54, $p < .001$; SMC-USA: β = .58, $p < .001$; TUC-Kenya: β = .68, $p <$

.001; ULS-France: β = .66, p < .001; ULS-Mexico: β = .53, p < .001). For all institutions/countries, for every one-unit increase in Lasallian Mission Value (1 Standard Deviation), there was a 0.60 average increase in Spiritual Impact. R-squared was significant: Lasallian Mission Value explained 36 percent of the variance in Spiritual Impact.

In the second model, Previous Lasallian Education Experience was added as a second predictor of Spiritual Impact. Overall (all institutions/countries), the effect of Lasallian Mission Value remained the same (β = .60, p < .001), and Previous Lasallian Education Experience had no statistically significant effect on Spiritual Impact, when controlling for Lasallian Mission Value (β = −.04, p > .05). Among the six institutions/countries, four show that Spiritual Impact is not statistically significantly related to Previous Lasallian Education Experience (BU-Palestine, p > .05; DLSU-Philippines, p > .05; TUC-Kenya, p > .05; ULS-France, p > .05).

However, Previous Lasallian Education Experience had a statistically significant effect at two institutions/countries (p < .05). At SMC-USA, while the effect of Lasallian Mission Value remained approximately the same (Model 1: β = .58, p < .001; Model 2: β = .57, p < .001), Previous Lasallian Education Experience had statistically significant effect on Spiritual Impact, when controlling for Lasallian Mission Value (β = .10, p < .05). Students who attended Lasallian schools previously had a 0.10 average higher Spiritual Impact relative to students who did not, when taking into account Mission Value. At ULS-Mexico, the effect of Lasallian Mission Value on Spiritual Impact increased (Model 1: β = .53, p < .001; Mode 2: β = .59, p < .001). Previous Lasallian Education Experience had statistically significant effect on Spiritual Impact, when controlling for Lasallian Mission Value (β = −.28, p < .05). Students who had previous experience reported a 0.28 average lower Spiritual Impact relative to students who did not, when taking into account Lasallian Mission Value. Adding Previous Lasallian Education Experience to the model added an additional 8 percent variance in explaining Spiritual Impact (Model 1: R^2 = .28; Model 2: R^2 = .36).

Table 20 presents the results from the regression analysis of Social Impact. In Model 1, Social Impact was regressed on Lasallian Mission Value. In Model 2, Social Impact was regressed on Lasallian Mission Value and Previous Lasallian Education Experience.

Table 20. Regression of Social Impact on Lasallian Mission Value and Previous Lasallian

		Education Experience		
		LMV	Previous	R^2
All Institutions	M1β	.58***	--	0.34
	M2β	.58***	0.01	0.34
BU-Palestine	M1β	.48***	--	0.23
	M2β	.50***	-0.13	0.25
DLSU-Philippines	M1β	.57***	--	0.33
	M2β	.57***	0.05	0.33
SMC-USA	M1β	.52***	--	0.27
	M2β	.51***	.12**	0.29
TUC-Kenya	M1β	.50***	--	0.25
	M2β	.51***	0.18	0.28
ULS-France	M1β	.63***	--	0.39
	M2β	.63***	0.01	0.39
ULS-Mexico	M1β	.78***	--	0.6
	M2β	.82***	-.19*	0.63

Note. BU-Palestine = Bethlehem University, Palestine (RELAN); DLSU-Philippines = De La Salle University, Manila, Philippines (PARC); SMC-USA = Saint Mary's College of California, Moraga, USA (RELAN); TUC-Kenya = Tangaza University College, Nairobi, Kenya (RELAF); ULS-France = UniLaSalle, Beauvais, France (RELEM); ULS-Mexico = Universidad La Salle, Mexico City, Mexico (RELAL); M1β = Model 1 β; M2β = Model 2 β; LMV = Lasallian Mission Value; Previous = Previous Lasallian Education Experience

*$p < .05$. **$p < .01$. ***$p < .001$.

First, regression model 1 included Lasallian Mission Value as a predictor of Social Impact. In this model, Lasallian Mission Value had a statistically significant effect on Social Impact in all institutions/countries (β = .58, $p < .001$). For every one-unit increase in Lasallian Mission Value (1 Standard Deviation), there was a 0.58 average increase in Social Impact. Also, Lasallian Mission Value explained 34 percent of the variance in Social Impact (R^2 = .34). At all six participating institutions, Lasallian Mission Value had a statistically significant effect on Social Impact (BU-Palestine: β = .48, $p < .001$; DLSU, Philippines: β = .57, $p < .001$; SMC-USA: β = .52, $p < .001$; TUC-Kenya: β = .50, $p < .001$; ULS-France: β =

.63, $p < .001$; ULS-Mexico: $\beta = .78$, $p < .001$).

Second, model 2 added Previous Lasallian Education Experience as a second predictor of Social Impact. At all institutions/countries, the effect of Lasallian Mission Value remained the same ($\beta = .58$, $p < .001$), and Previous Lasallian Education Experience had no statistically significant effect on Social Impact, when controlling for Lasallian Mission Value ($\beta = .01$, $p > .05$). Of the six institutions/countries, four report that Social Impact is not statistically significantly related to Previous Lasallian Education Experience (BU-Palestine, $p > .05$; DLSU-Philippines, $p > .05$; TUC-Kenya, $p > .05$; ULS-France, $p > .05$). Two institutions/countries report otherwise.

At SMC-USA, Lasallian Mission Value had a statistically significant effect on Social Impact ($\beta = .52$, $p < .001$) in model 1. In model 2, while the effect of Lasallian Mission Value remained approximately the same ($\beta = .51$, $p < .001$), Previous Lasallian Education Experience had statistically significant effect on Social Impact, when controlling for Lasallian Mission Value ($\beta = .12$, $p < .01$). That is, students who attended Lasallian schools previously had a 0.12 average higher Social Impact relative to students who did not, even when taking into account Lasallian Mission Value. Adding Previous Lasallian Education Experience to the model added an additional 2 percent variance in explaining Social Impact (Model 1: $R^2 = .27$; Model 2: $R^2 = .29$). At ULS-Mexico, Lasallian Mission Value had a statistically significant effect on Social Impact ($\beta = .78$, $p < .001$) in model 1. That is, for every one-unit increase in Lasallian Mission Value (1 Standard Deviation), there was a 0.78 average increase in Social Impact. R-squared was significant: Lasallian Mission Value explained 60 percent of the variance in Social Impact at ULS-Mexico. In model 2, the effect of Lasallian Mission Value increased ($\beta = .82$, $p < .001$). Previous Experience had a statistically significant effect on Social Impact, when controlling for Lasallian Mission Value ($\beta = -.19$, $p < .05$). Students who attended Lasallian schools previously reported a 0.19 average lower Social Impact relative to students who did not, when taking into account Lasallian Mission Value. By adding Previous Lasallian Education Experience to the model, R-squared increased. At ULS-Mexico, Lasallian Mission Value and Previous Lasallian Education Experience explained 63 percent of the variance in Social Impact.

Table 21 displays the results from the regression analysis of Career Impact. In Model 1, Career Impact was regressed on Lasallian Mission Value. In Model 2, Career Impact was

regressed on Lasallian Mission Value and Previous Lasallian Education Experience.

Table 21. Regression of Career Impact on Lasallian Mission Value and Previous Lasallian Education Experience

		LMV	Previous	R^2
All Institutions	M1β	.51***	--	0.26
	M2β	.51***	-0.03	0.26
BU-Palestine	M1β	.31***	--	0.1
	M2β	.33***	-0.11	0.11
DLSU-Philippines	M1β	.50***	--	0.25
	M2β	.49***	0.11	0.26
SMC-USA	M1β	.51***	--	0.26
	M2β	.51***	0.04	0.26
TUC-Kenya	M1β	.52***	--	0.28
	M2β	.54***	0.18	0.31
ULS-France	M1β	.51***	--	0.26
	M2β	.51***	0	0.26
ULS-Mexico	M1β	.64***	--	0.41
	M2β	.69***	-.25*	0.47

Note. BU-Palestine = Bethlehem University, Palestine (RELAN); DLSU-Philippines = De La Salle University, Manila, Philippines (PARC); SMC-USA = Saint Mary's College of California, Moraga, USA (RELAN); TUC-Kenya = Tangaza University College, Nairobi, Kenya (RELAF); ULS-France = UniLaSalle, Beauvais, France (RELEM); ULS-Mexico = Universidad La Salle, Mexico City, Mexico (RELAL); M1β = Model 1 β; M2β = Model 2 β; LMV = Lasallian Mission Value; Previous = Previous Lasallian Education Experience

*$p < .05$. ***$p < .001$.

First, model 1 included Lasallian Mission Value as a predictor of Career Impact. As shown in Table 21, Lasallian Mission Value had a statistically significant effect on Career Impact in all institutions/countries (β = .51, $p < .001$). Across institutions/countries, for every one-unit increase in Lasallian Mission Value (1 Standard Deviation), there was a 0.51 average increase in Career Impact. Lasallian Mission Value explained 26 percent of the variance in

Career Impact ($R^2 = .26$). At all six participating institutions, Lasallian Mission Value had a statistically significant effect on Career Impact (BU-Palestine: $\beta = .31$, $p < .001$; DLSU-Philippines: $\beta = .50$, $p < .001$; SMC-USA: $\beta = .51$, $p < .001$; TUC-Kenya: $\beta = .52$, $p < .001$; ULS-France: $\beta = .51$, $p < .001$; ULS-Mexico: $\beta = .64$, $p < .001$).

Model 2 added Previous Lasallian Education Experience as a second predictor of Career Impact. For all institutions/countries, the effect of Lasallian Mission Value remained the same ($\beta = .51$, $p < .001$), and Previous Lasallian Education Experience had no statistically significant effect on Career Impact, when controlling for Mission Value ($\beta = -.03$, $p > .05$). Except for ULS-Mexico, all institutions in this sample show that Career Impact is not statistically significantly related to Previous Lasallian Education Experience (BU-Palestine, $p > .05$; DLSU-Philippines, $p > .05$; SMC-USA, $p > .05$; TUC-Kenya, $p > .05$; ULS-France, $p > .05$).

At ULS-Mexico, in the first model, Lasallian Mission Value had a statistically significant effect on Career Impact ($\beta = .64$, $p < .001$). In the second model, the effect of Lasallian Mission Value increased ($\beta = .69$, $p < .001$), and Previous Lasallian Education Experience had statistically significant effect on Career Impact, when controlling for Lasallian Mission Value ($\beta = -.25$, $p < .05$). That is, students who attended Lasallian schools previously had a 0.25 average lower Career Impact relative to students who did not, when taking into account Lasallian Mission Value. At ULS-Mexico, adding Previous Lasallian Education Experience to the model added an additional 6 percent variance in explaining Career Impact (Model 1: $R^2 = .41$; Model 2: $R^2 = .47$).

The findings indicate that having Previous Lasallian Education Experience had no statistically significant effect on Lasallian Mission Value. Also, the findings indicate that Lasallian Mission Value had statistically significant effect on Lasallian Mission Impact at all schools in this sample ($p < .001$), but having Previous Lasallian Education Experience had no statistically significant effect on Lasallian Mission Impact in general (all institutions/countries), when controlling for Lasallian Mission Value ($p > .05$). That is, there is no significantly different average Lasallian Mission Impact between the group with previous Lasallian education experience and the group without previous Lasallian education experience. However, at some individual institutions/countries, Previous Lasallian Education Experience had a statistically significant effect on different types of Lasallian Mission Impact

($p < .01$ or $p < .05$) and was positively or negatively related to the Lasallian Mission Impact, as reported above.

Discussion

Data collected from six different Lasallian institutions of higher education in six different countries through the instrument, Lasallian Mission Impact Inventory [LMII], provided valuable information to explore and understand the perceptions of the Lasallian mission impact on student development. The statistical analysis of data provided findings to address the research questions of the study.

Research question 1 examined the relationship between Lasallian Mission Understanding and Lasallian Mission Value. Regarding this relationship, the findings of the data analysis indicated that Lasallian Mission Understanding was significantly and positively associated with Lasallian Mission Value (all institutions/countries: $r = .58$, $p < .001$; BU-Palestine: $r = .52$, $p < .001$; DLSU-Philippines: $r = .61$, $p < .001$; SMC-USA: $r = .50$, $p < .001$; TUC-Kenya: $r = .62$, $p < .001$; ULS-France: $r = .60$, $p < .001$; ULS-Mexico: $r = .63$, $p < .001$).

Research question 2 investigated the relationship between Lasallian Mission Value and Lasallian Mission Impact. Concerning this relationship, the analysis of data revealed statistically significant correlations. According to the findings, Lasallian Mission Value was positively associated with Academic Impact (all institutions/countries: $r = .63$, $p < .001$; BU-Palestine: $r = .42$, $p < .001$; DLSU-Philippines: $r = .54$, $p < .001$; SMC-USA: $r = .58$, $p < .001$; TUC-Kenya: $r = .58$, $p < .001$; ULS-France: $r = .74$, $p < .001$; ULS-Mexico: $r = .72$, $p < .001$). Lasallian Mission Value was also positively associated with Spiritual Impact (all institutions/countries: $r = .60$, $p < .001$; BU-Palestine: $r = .58$, $p < .001$; DLSU-Philippines: $r = .54$, $p < .001$; SMC-USA: $r = .58$, $p < .001$; TUC-Kenya: $r = .68$, $p < .001$; ULS-France: $r = .66$, $p < .001$; ULS-Mexico: $r = .53$, $p < .001$). Lasallian Mission Value was also positively associated with Social Impact (all institutions/countries: $r = .58$, $p <.001$; BU-Palestine: $r = .48$, $p < .001$; DLSU-Philippines: $r = .57$, $p < .001$; SMC-USA: $r = .52$, $p < .001$; TUC-Kenya: $r = .50$, $p < .001$; ULS-France: $r = .63$, $p < .001$; ULS-Mexico: $r = .78$, $p < .001$). And, Lasallian Mission Value was positively associated with Career Impact as well (all institutions/countries: $r = .51$, $p < .001$; BU-Palestine: $r = .31$, $p < .001$; DLSU-Philippines: r

= .50, $p < .001$; SMC-USA: $r = .51$, $p < .001$; TUC-Kenya: $r = .52$, $p < .001$; ULS-France: $r = .51$, $p < .001$; ULS-Mexico: $r = .64$, $p < .001$).

Research question 3 explored the relationships among students who have Previous Lasallian Education Experience, and Lasallian Mission Value and Lasallian Mission Impact. The findings from the data analysis identified no statistically significant relationships in general. First, Lasallian Mission Value is not statistically significantly related to the Previous Lasallian Education Experience group (all institutions/countries, $p > .05$; BU-Palestine, $p > .05$; DLSU-Philippines, $p > .05$; SMC-USA, $p > .05$, TUC-Kenya, $p > .05$; ULS-France, $p > .05$; ULS-Mexico, $p > .05$). Second, all four types of Lasallian Mission Impact are not statistically significantly related to the Previous Lasallian Education Experience group in general (all institutions/countries, $p > .05$).

However, at some individual institutions/countries (SMC-USA; TUC-Kenya; ULS-Mexico), Previous Lasallian Education Experience was positively or negatively related to the Lasallian Mission Impact ($p < .05$ or $p < .01$), when controlling for Lasallian Mission Value.

Conclusion

In this section, conclusions drawn from those findings are presented. They are discussed in order of the research questions presented in this study. This study concludes that many students at Lasallian institutions of higher education across the Lasallian Regions understand and value the mission and that the mission has significant impact on the holistic development of students who value it.

Lasallian Mission Understanding and Lasallian Mission Value

Research Question 1 examined three topics: (a) students' personal understanding of the mission of Lasallian institutions of higher education, (b) the personal value the students placed on the mission, and (c) the relationship between Lasallian Mission Understanding and Lasallian Mission Value. Based on the responses of students to the survey items regarding their personal understanding of the Lasallian mission, it is evident that many students who participated in this study understand the Lasallian mission of their school well. Also, the responses of students to the items concerning their personal value on the Lasallian mission

make it apparent that the Lasallian mission is of personal value to most of them. By investigating the relationship between how much students understand the Lasallian mission and how much they value the Lasallian mission, the findings show that these two are highly related to each other and that students' understanding of the mission is predictive of the value they place on the mission. That is, the better students understand the Lasallian mission, the more they value the Lasallian mission. This applies to all six participating institutions/countries across the Lasallian Regions.

This conclusion about the degree of students' understanding of the Lasallian mission and students' value for the Lasallian mission may have important implications. Considering the high percentage of positive responses to survey items 1 to 3, it can be said that many students from Lasallian institutions of higher education across the Lasallian Regions are aware of and understand the Lasallian mission. Considering the even slightly higher percentage of positive responses to survey items 4 to 6, it can also be said that most students at Lasallian institutions of higher education across Lasallian Regions value the Lasallian mission and that the Lasallian mission matters to them.

Most importantly, the strong relationship between students' understanding of the mission and the strong value they place on the mission might provide Lasallian institutions of higher education with a consequential direction for future strategic planning and program development. Since it appeared that students value the mission more when they understand it better, Lasallian institutions might need to pay sufficient attention to and be intentional about their efforts and strategies to assist their students in increasing awareness of the mission, to help students value the Lasallian mission and make personal connections with the mission. At this point, the critical question Lasallian schools should ask is whether students' personal value for the mission has something to do with educational outcomes. An attempt to answer that question—the impact of the Lasallian mission on student development—was explored through Research Question 2.

Lasallian Mission Value and Lasallian Mission Impact

Research Question 2 investigated three issues: (a) students' perceptions of the four types of Lasallian Mission Impact on their development—Academic Impact, Spiritual Impact, Social

Impact, and Career Impact; (b) the relationship between students' personal value on the Lasallian mission and students' perceptions of the four types of Lasallian Mission Impact; and (c) comparison of the strength of the relationships.

The majority of participants reported high impact of the Lasallian mission on their academic, spiritual, and social development. The majority of participants reported low impact of the mission on their career development. Regarding the four types of Lasallian Mission Impact, Social Impact was reported as the highest in all six institutions. This might reflect the characteristic of Lasallian education which is "fundamentally relational" and "community-based" (Mann, 2018, p. 31). From the beginning of the Institute, the Brothers of the Christian Schools chose to be called "brother" instead of "teacher," committing themselves to be brothers to each other, so that they can also be brothers to the students they serve. This relational component of Lasallian education might be a possible explanation for why students across all five Lasallian Regions reported the highest impact of the Lasallian mission on their social development among the four types of Lasallian Mission Impact.

Through the examination of the relationship between the personal value students place on the Lasallian mission and students' perceptions of four types of Lasallian Mission Impact, the statistically significant and positive linear relationship between Lasallian Mission Value and Lasallian Mission Impact became clear in all six institutions. In other words, the higher students value the Lasallian mission, the higher impact the Lasallian mission has on their academic, spiritual, social, and career development, across all regions. This finding confirms that students' personal value on the mission is predictive of the students' perceptions of all four types of mission impact. Therefore, it suggests that helping students place a higher value on the mission is important, since it is positively associated with all four types of Lasallian Mission Impact. Considering the previous conclusion about the strong relationship between students' understanding of the mission and students' value for the mission, it can be said that assisting students in increasing awareness and understanding of the Lasallian mission is also important, because it can help students enhance their value for the Lasallian mission; this might help improve the impact of the Lasallian mission on students' holistic development. The findings of the study support the need for effective mission formation and integration. From this perspective, the importance of more effective mission program development and support to help students grow in mission understanding deserves institutional attention.

Overall, across all institutions and countries, the strongest relationship was found between students' value for the mission and Academic Impact. In order, Spiritual Impact, Social Impact, and Career Impact followed. However, individual institutions exhibited a different order. At BU-Palestine and TUC-Kenya, the relationship between Lasallian Mission Value and Spiritual Impact appeared as the strongest. At DLSU-Philippines and ULS-Mexico, the relationship between Lasallian Mission Value and Social Impact was the highest. Students at SMC-USA and ULS-France, reported the strongest relationship between Lasallian Mission Value and Academic Impact. There was no institution where the relationship between Lasallian Mission Value and Career Impact appeared as the highest.

Comparing all six institutions/countries, the strongest relationship between Lasallian Mission Value and Academic Impact was found at ULS-France; Spiritual Impact at TUC-Kenya; Social Impact at ULS-Mexico; and Career Impact at ULS-Mexico. This might provide Lasallian institutions of higher education with some ideas for more effective mission formation and integration by looking into existing programs and support connected to students' academic development at USL-France; programs and support related to students' spiritual development at TUC-Kenya; and programs and support pertaining to students' social and career development at ULS-Mexico. Moreover, the findings suggest that more effective mission formation and integration to support students' career development is necessary, considering that the lowest Lasallian Mission Impact is on students' career development and the weakest relationship is between Lasallian Mission Value and Career Impact.

Previous Lasallian Education Experience, Lasallian Mission Value, and Lasallian Mission Impact

Research Question 3 explored two matters: (a) the relationship between the personal value students place on the Lasallian mission and having previously attended a Lasallian school, and (b) the relationships between each Lasallian Mission Impact and having Previous Lasallian Education Experience, when controlling for the value students place on the mission.

About 36 percent of students in this sample previously attended Lasallian schools, and ULS-France was the only institution where a majority of students (68%) had prior Lasallian education experience. Regardless of the size of the previous Lasallian education experience

group at each institution, this group did not show any different value for the Lasallian mission compared with the group of students who had no previous Lasallian education experience.

Also, having previous Lasallian education experience did not have any significant effect on Academic Impact, Spiritual Impact, Social Impact, or Career Impact, when taking into account students' value for the mission, in general (all institutions/countries). However, some individual institutions showed a different relationship. For example, at SMC-USA, those with previous Lasallian education experience showed more impact of the mission on their academic, spiritual, and social development than the other group, when controlling for students' value for the mission. Conversely, at ULS-Mexico, those with previous Lasallian education experience reported less mission impact on their spiritual, social, and career development.

Overall, across all institutions and countries, having previous Lasallian education experience didn't have any significant effect on the personal value students placed on the Lasallian mission. Nor did having previous Lasallian education experience have any significant effect on students' perceptions of the Lasallian mission impact on their development, is somewhat surprising finding. In addition, at some institutions, a negative relationship was reported between having previous Lasallian education experience and the Lasallian mission impact on students' development. One important implication from this finding would be to recognize the need to develop and provide specific mission programs and support that will help the students with previous Lasallian education experience deepen their understanding of and the value for the mission.

Finally, the conclusion drawn from the findings of the data analysis can be interpreted through the lens of a metatheory of spiritual formation (Welch and Koth, 2013), which provided the theoretical framework for the research design of this study.

According to the theory, the spiritual formation process has six relational spaces: Unknown, Encounter, Authentication, Radicalization, Integration, and Practice. These six spaces correspond to the six composite variables of this study: Lasallian Mission Understanding, Lasallian Mission Value, Academic Impact, Spiritual Impact, Social Impact, and Career Impact. When comparing the overall descriptive statistics, it is the Lasallian Mission Value that showed the highest percentage of positive responses. And this variable corresponds to

"Encounter" of the spiritual formation process. Considering that the education level of the largest participant group in this sample is first year students, "Encounter" could reflect where they were in the spiritual formation process of their Lasallian journey. Also, overall, across all institutions and countries, the statistically significant and positive relationships were found between students' value for the mission and Academic Impact, Spiritual Impact, Social Impact, and Career Impact, in that order. This may be explained as reflecting the developmental process of "Authentication," "Radicalization," "Integration" and "Practice" in the students' spiritual formation.

Research Limitations and Recommendations

Research Limitations

This is a descriptive research study focusing on college students' perceptions regarding the impact of the Lasallian mission on their development. Data is self-reported, and the findings are correlational. Limitations on random sampling in each participating school are acknowledged due to difficulties in data collection in other countries. Most importantly, this research was conducted under the extremely unusual situation of the global pandemic. The unprecedented circumstances might have affected the data collection process. The lockdown of the institution due to the pandemic significantly limited students' access to the Internet. This means only students who had access to technology could take the survey. Also, the uneven sample size from each research site may have limited the effectiveness of the data comparison among the six institutions. The need for more collective tools as possible options across the Lasallian network should be factored into any conclusions.

Recommendations for Future Practice

Still, this study may provide some important implications for the future professional practice of Lasallian institutions of higher education. First, the findings of the study suggest the importance of students' understanding of the Lasallian mission and the value they place on the Lasallian mission, which will have an impact on the students' holistic development. Second, the findings of the study indicate the need to develop more effective mission-integration programs for students' career development, since majority of participants reported low mission impact on their career development. And third, the findings suggest the need to

provide more targeted support for the students who previously attended Lasallian schools to deepen their understanding of and personal value for the mission.

Recommendations for Future Research

Based upon the results of this study, the researcher would like to present some recommendations for future Lasallian research. The recommendations are as follows:

First, this quantitative descriptive research based on self-reported data needs to be corroborated by qualitative research. Following up this study with qualitative research to get more data on what is happening with the mission in the same institutions would be effective. Interviews with students to ask about their experience regarding mission formation and integration, and to find out what worked for them to help them understand and value the Lasallian mission are highly recommended. Most especially, research on existing mission programs and students' experience with those programs will provide invaluable information for development of more effective mission-integration programs.

Second, this study examined the impact of the Lasallian mission on student development. One important question raised by this study is: "What is the impact of the mission on other constituencies of the institution?" Effective mission integration is premised upon the commitment to the mission of the entire community. Future research might investigate the impact of the Lasallian mission on faculty development, or staff development, or both.

Acknowledgements

It is the Lasallian mission that differentiates Lasallian education from other types of Catholic education and sustains Lasallian educators as who they are throughout all these times. As the mission of an institution is the foundation of its work (Daniels & Gustafson, 2016), the Lasallian mission is the cornerstone of the work of all Lasallian institutions, including Lasallian institutions of higher education.

The researcher encountered the Lasallian mission by experiencing it through people who embodied the mission. The Lasallian mission lived out by Lasallian educators has touched many hearts and its impact on students' academic, spiritual, social, and career development

has changed many lives for good. The researcher happened to be one of those many lives, and that personal experience became the genesis for this research study.

This research couldn't be accomplished without the tremendous support of the Institute's General Councilor in Rome and Lasallian partners in six institutions. Their support was indispensable for the completion of the study. The researcher also would like to thank all the students who chose to participate in the study despite all the challenges of the Spring 2020 during the unprecedented global pandemic.

They made this journey truly meaningful, fruitful, and Lasallian. The researcher hopes this study can make a small contribution to the worldwide Lasallian family, a community of faith, zeal, hope, and persistence to create "the Lasallian world where education is everybody's birthright" (Br. Rodriguez Echeverria).

References

About Bethlehem University, Mission & History (2020). Mission & History: Mission Statement. Retrieved December 25, 2020, from About Bethlehem University – Bethlehem University

About SMC, Core Traditions. (n.d.). Core Traditions: There are three traditions that form the foundation of Saint Mary's College and guide us in all we do. Retrieved December 25, 2020, from Core Traditions | Saint Mary's College (stmarys-ca.edu)

About SMC, Facts & Figures. (n.d.). Facts & Figures: CURRENT RANKINGS. Retrieved May 10, 2020, from https://www.stmarys-ca.edu/about-smc/facts-figures

About SMC, Our History. (n.d.). Our History: Archbishop Joseph Alemany had been dispatched to the West Coast in the mid-19th century by Pope Pius IX with the words: "You must go to California. Others go there to seek gold; you go there to carry the cross." Retrieved May 10, 2020, from https://www.stmarys-ca.edu/about-smc/history-heritage

About SMC, Our Mission. (n.d.). Our Mission: Saint Mary's College of California invites you to passionately embrace knowledge, the challenges of scholarship, and the capacity to make lasting change in the world. Retrieved December 25, 2020, from Our Mission | Saint Mary's College (stmarys-ca.edu)

About Us, Mission and History. (n.d.). Mission and History: Mission Statement. Retrieved May 10, 2020, from https://www.bethlehem.edu/BBNC/www.bethlehem.edu/about/mission-history.html

Association of Catholic Colleges and Universities. (2018). *Institutional principles for Catholic identity and mission assessment: A best practices guide.* Washington, DC: Author

Astin, A. W., Astin, H. S., Lindholm, J. A., Bryant, A. N., Calderone, S., & SzelenyL, K. (2005). *The spiritual life of college students: A national study of college students' search for meaning and purpose.* Los Angeles, CA: UCLA Higher Education Research Institute.

Bolton, P. (2013). A curriculum for learning how to "live well," for good living, for living the good life. In P. M. Gil & D. Munoz (Eds.), *That your school runs well: Approach to Lasallian educational model* (pp. 301-322). Rome, Italy: Brothers of Christian Schools.

Botana, A. (2008, May). *Lasallian essays 3: Thematic vocabulary of Lasallian Association.* Rome, Italy: Brothers of the Christian Schools. 62-69.

Brothers of the Christian Schools. (1997). *The Brother of the Christian Schools in the world Today: A DECLARATIO.* (Revised English translation). Rome, Italy: Author.

Brothers of the Christian Schools. (2002). *The rule*. Rome, Italy: Author.

Brothers of the Christian Schools. (2016, February). Memento. Rome, Italy.

Brothers of the Christian Schools District of San Francisco. (2009). *John Baptist de La Salle Founder, Educator, Saint: The founding story of Lasallian education*. Napa, CA: Author.

Caruso, M. P. (2012). *When the sisters said farewell: The transition of leadership in Catholic elementary schools.* Lanham, Maryland: Rowman & Littlefield Education.

Choi, B, K., & Rhee, B. S. (2014). The influences of student engagement, institutional mission, and cooperative learning climate on the generic competency development of Korean undergraduate students. *Higher Education, 67*, 1-18. Doi: 10.1007/s10734-013-9637-5

Christian Brothers Conference. (1994). *Meditation by John Baptist de La Salle*. Volume 4 of Lasallian sources: The complete work of John Baptist de La Salle. Landover, Maryland: Author.

Christian Brothers Conference. (1996). *The Conduct of the Christian Schools.* Volume 6 of Lasallian sources: The complete work of John Baptist de La Salle. Washington, DC:

Author.

Daniels, J. R., & Gustafson, J. N. (2016). Faith-based institutions, institutional mission, and the public good. *Higher Learning Research Communication, 6* (2), 1-11.

De La Salle University, HISTORY AND TRADITIONS. (2013). A Brief History: De La Salle University was established in 1911 by the Catholic teaching congregation Brothers of the Christian Schools (FSC, from the Latin: Fratres Scholarum Christianarum). Retrieved May 10, 2020, from https://www.dlsu.edu.ph/inside/history-and-traditions/

De La Salle University, QUICK FACTS AND FIGUES. (2019). De La Salle University positions itself as a leader in molding human resources who serve the church and the nation. Retrieved May 10, 2020, from https://www.dlsu.edu.ph/inside/

De La Salle University, VISION-MISSION. (2017). Preamble: De La Salle University is an internationally recognized Catholic university in the Philippines established by the Brothers of the Christian Schools in 1911. Retrieved December 24, 2020 from Vision-Mission - De La Salle University (dlsu.edu.ph)educartis. (n.d.). Christ the Teacher Institute for Education, University – Nairobi. Retrieved December 24, 2020, from Christ the Teacher Institute for Education | Educartis

Fehrenbach, M. (2016). *Schools of Character: Faith-Inspired Public Schools in the Catholic Lasallian Tradition.* Winona, MN: Saint Mary's Press.

Ferrari, J. R., & Cowman, S. E. (2004). Toward a reliable and valid measure of institutional mission and values perception: The DePaul values inventory. *Journal of Beliefs & Values, 25* (1), 43-54, doi: 10.1080/1361767042000198979

Ferrari, J. R., Kapoor, M., & Cowman, S. E. (2005). Exploring the relationship between students' values and the values of postsecondary institutions. *Social Psychology of Education, 8*, 207–221. Doi: 10.1007/s11218-004-5097-1

Ferrari, J. R., Cowman, S. E., Milner, L. A., Gutierrez, R. E., & Drake, P. A. (2009). Impact of school sense of community within a faith-based university: administrative and academic staff perceptions on institutional mission and values. *Social Psychology of Education, 12*, 515–528. doi: 10.1007/s11218-009-9093-3

Ferrari, J. R., & Velcoff, J. (2006). Measuring staff perceptions of university identity and activities: The mission and values inventory. *Christian Higher Education, 5* (3), 234-261.

Fowler, F. J. (2014). *Survey research methods (5th Ed.)*. Thousand Oaks, CA: SAGE

Publications, Inc.

Franz, C. J. (2006). True to a vision, steadfast to a dream. In C. J. Franz (Ed.), *Current opportunities and future visions: Reflections on Lasallian higher education* (pp. 29-45). Moraga, CA: Saint Mary's Press.

GLUNIS. (n.d.). Christ The Teacher Institute for Eudcation – Tangaza University College: Proudly forms all-round educators out of ordinary women and men of good will who are dedicated to Teaching Minds, Touching Hearts & Transforming Lives. Retrieved December 24, 2020, from Christ the Teacher Institute for Education - Tangaza University College, Lang'ata South Road, Nairobi (2020) (glunis.com)

Goussin, J. (2003). *The mission of human and Christian education: The gospel journey of John Baptist de La Salle.* Melbourne, Australia: Lasallian Education Services.

Hengemüle, E. (2006). The Lasallian University. In C. J. Franz (Ed.), *Current opportunities and future visions: Reflections on Lasallian higher education* (pp. 46-56). Moraga, CA: Saint Mary's Press.

International Council for Association and Lasallian Educational Mission (CIAMEL). (2018). *Lasallian Identity and Vitality Criteria. "Draft"* Retrieved from: https://drive.google.com/file/d/1SFiG5AlltDq7ySRVM_7kHiwSTzcH_u1/view?usp=sharing_eil&ts=5cf56d75

Lasallian District of San Francisco New Orleans. (n.d.). Lasallian World: The Institute of the Brothers of the Christian Schools is a Catholic religious order of laymen whose mission is to provide spiritual and human education to the young, especially the poor. Retrieved July 7, 2019 from: https://delasalle.org/who-we-are/history/

LaSalle.org. (n.d.). LaSalle.org: Regions and Districts. Retrieved September 15, 2019 from: https://www.lasalle.org/en/where-we-are/regiones/

LaSalle RELAN. (2019). Buttimer: The 2020 Buttimer Institute will take place June 28 – July 11, 2020, at Manhattan College in Riverdale, New York. Retrieved January 31, 2020 from: https://www.lasallian.info/programs-events/buttimer/

LaSalle Universities. (n.d.). *Identity of a Lasallian European Universitarian Institution.* Retrieved from: https://drive.google.com/file/d/1SBveQedLBXnFGdhjYBeurB7yv5rSUjnM/view?usp=sharing_eil&ts=5cf56d75

Living Lasallian. (2015, January). The Lasallian Educational Tradition: From the Christian Brothers of Saint Mary's

College. Retrieved December 25, 2020, from The Lasallian Educational Tradition | Saint

Mary's College (stmarys-ca.edu)

Living Lasallian. (2016, March). Lasallian Core Principles: The Saint Mary's experience is guided by the Lasallian Core Principles. Retrieved July 2, 2019, from: https://www.stmarys-ca.edu/living-lasallian/core-principles

Lowery, D. (2012). Catholic higher education as mission. *Journal of Catholic Higher Education, 31* (1), 83-117.

Mann, W. (2018). The Lasallian higher education network today. *AXIS: Journal of Lasallian Higher Education, 9* (3), 25-39. Institute for Lasallian Studies at Saint Mary's University of Minnesota.

Manning, P. R. (2014). Forming the whole disciple: A guide to crafting a truly holistic Catholic religious education. *Catholic Education: A Journal and Practice, 17* (2).

Ozar, L. A., & Weitzel-O'Neill, P. (Eds.). (2012). *National standards and benchmarks for effective Catholic elementary and secondary schools.* Chicago, IL: Loyola University Chicago, Center for Catholic School Effectiveness.

Patton, L. D., Renn, K. A., Guido, F. M., & Quaye, S. J. (2016). *Student development in college: Theory, research, and practice (3rd Ed.).* San Francisco, CA: Jossey-Bass.

Procario-Foley, C. B. (2017). Institutional mission education as a form of teaching. *Religious Education, 112* (3), 264-274.

Ramírez Barba, G. (2018). Some questions and answers about Lasallian higher education. *AXIS: Journal of Lasallian Higher Education, 9* (2), 65-83. Institute for Lasallian Studies at Saint Mary's University of Minnesota.

Rodríguez Echeverría, Á. (2018). University education within the Lasallian mission. *AXIS: Journal of Lasallian Higher Education, 9* (3), 107-117. Institute for Lasallian Studies at Saint Mary's University of Minnesota.

Rummary, G. (1987). What de La Salle lived and achieve. The double contemplation. (Unpublished manuscript).

Rummary, G. (2006). Lasallian scholarship and higher education. In C. J. Franz (Ed.), *Current opportunities and future visions: Reflections on Lasallian higher education* (pp. 159-169). Moraga, CA: Saint Mary's Press.

Rummary, G. (2012). Lasallian spirituality. (Unpublished manuscript).

Saint Mary's University of Minnesota, University Catalog. (2018). Institutes and Affiliate Programs: Christ the Teacher Institute for Education. Retrieved May 10, 2020, from https://catalog.smumn.edu/content.php?catoid=20&navoid=1142#Christ_the_Teacher

_Institute_for_Education

Schieler, R. (2018). The impact of Lasallian universities: Three touchstones to identity. *AXIS: Journal of Lasallian Higher Education, 9* (2), 99-110. Institute for Lasallian Studies at Saint Mary's University of Minnesota.

Sterk Barrett, M. (2016). Dimensions of spirituality fostered through the PULSE program for service learning. *Journal of Catholic Education, 20* (1), 114-135.

Tangaza University College, About Us. (2019). Our History: Tangaza University College, then called the Theological Centre of Religious, opened its doors to the first group of students of theology on 25th August 1986. Retrieved May 10, 2020, from https://tangaza.ac.ke/about-us/

Tangaza University College, Why Study at Tangaza? (2019). We are one of the middle range private universities, with 30 years imparting knowledge through distinguished academic excellence. Retrieved May 10, 2020, from http://tangaza.ac.ke/

Tidd, K. M. (2009a). The evolution of "Association" as a model for lay/religious collaboration in Catholic education, Part I: From "one and only master" to the Lasallian family, 1719-1986. *Catholic Education: A Journal of Inquiry and Practice, 12* (3), 320-338.

Tidd, K. M. (2009b). The evolution of "Association" as a model for lay/religious collaboration in Catholic education, Part II: The emergence of shared mission as a ministry paradigm, 1986-2000. *Catholic Education: A Journal of Inquiry and Practice, 12* (4), 439-356.

UniLaSalle, About UniLaSalle. (2019). Resulting from the merger of ISAB, IGAL, Esitpa and Ecole des Métiers de l'Environnement (EME), UniLaSalle constitutes a center for higher education in Earth, life and environmental sciences that is recognized for its excellence in France and around the world. Retrieved May 10, 2020, from https://www.unilasalle.fr/en/about-unilasalle

UniLaSalle, Campus Beauvais. (2019). THE CAMPUS: The key numbers. Retrieved May 10, 2020, from https://beauvais.unilasalle.fr/

UniLaSalle, Educational project and values. (2019). Through the concept of integral training, UniLaSalle intends to create the optimal conditions for each young person to get to know themselves better, open up to others and develop their talents. Retrieved December 25, 2020 from Educational project and values | UniLaSalle

Universidad La Salle México, Educative offer. (n.d.). The La Salle University educational Model *has been distinguished by the Ministry of Public Education by granting it the*

title of University of Excellence with National Leadership. Retrieved May 10, 2020, from https://lasalle.mx/oferta-educativa/

Universidad La Salle México, Identity. (n.d.). Values: Our principles govern our personal and professional actions. Retrieved December 25, 2020, from https://lasalle.mx/somos-la-salle/identidad/valores.html

Universidad La Salle México, La Salle System and Network. (n.d.). Universities of Mexico: The Network has 15 campuses in Mexico, with the widest academic offer in all areas of knowledge, allowing an important academic connection, extension and research with universities in the world. Retrieved May 10, 2020, from https://lasalle.mx/somos-la-salle/sistema-y-red-la-salle/

Universidad La Salle México, We are La Salle. (n.d.). The origin in time and space of the La Salle University dates back to the 17th century in France, where John Baptist De La Salle founded in 1680 the Institute of the Brothers of the Christian Schools, to give academic and human education to children and disadvantaged youth of the time. Retrieved May 10, 2020, from https://lasalle.mx/somos-la-salle/historia.html

Vice Chancellor's Office, Institutional Research Unit. (2019). Institutional Research Unit: Quick Facts about Bethlehem University. Retrieved Many 10, 2020, from https://www.bethlehem.edu/BBNC/www.bethlehem.edu/facts.html

Walch, T. (2003). *Parish school: American Catholic parochial education from colonial times to the present.* Arlington, VA: National Catholic Educational Association.

Welch, M., & Koth, K. (2013). A metatheory of spiritual formation through service-learning in higher education. *Journal of College Student Development, 54* (6), 612-627. Johns Hopkins University Press. doi: https://doi.org/10.1353/csd.2013.0089

Wikipedia, De La Salle University. (2020). From Wikipedia, the free encyclopedia: For other uses, see La Salle University (disambiguation). Retrieved May 10, 2020, from https://en.wikipedia.org/wiki/De_La_Salle_University

Wikipedia, Unilasalle. (2020). From Wikipedia, the free encyclopedia: UniLaSalle is one of the 210 French engineering schools authorized to award engineering degrees. Retrieved May 10, 2020, from https://en.wikipedia.org/wiki/Unilasalle

Wikipedia, Universidad La Salle. (2020). From Wikipedia, the free encyclopedia: For other uses, see La Salle University (disambiguation). Retrieved May 10, 2020, from https://en.wikipedia.org/wiki/Universidad_La_Salle

Author Information

Dr. Hwa Seong Oh

https://orcid.org/0000-0003-0485-1163

Saint Mary's College of California

USA

Contact e-mail: *hoh@stmarys-ca.edu*

Citation

Oh, H. S. (2025). International Research on College Students' Perceptions regarding the Impact of the Lasallian Mission on Their Development. In M. Koc & O. T. Ozturk (Eds.), *Studies on Social and Education Sciences 2025* (pp. 21-103). ISTES.

Chapter 3 - The Unseen Revolution: Unlocking the Potential of Cross-Disciplinary Research

Abid Ali Khan, Tariq Hussain, Aftab Afzal, Mohamed Al Siyabi

Chapter Highlights

- The chapter focuses on the "unseen revolution," a powerful global shift toward cross-disciplinary research fundamentally reshaping engineering, science, and technology.
- It argues that the most profound advancements now occur at the intersections of established fields, moving away from increasing specialization.
- The work examines successful historical and contemporary case studies of convergence, such as materials science and biology or quantum physics and computer science, to show how integrating disparate knowledge leads to exponential progress.
- The study identifies and addresses the key intellectual and institutional barriers to effective cross-disciplinary collaboration, including terminological/ methodological gaps and issues like academic pillars and restrictive funding structures.
- The ultimate takeaway emphasizes the necessity of dismantling disciplinary boundaries and promoting intellectual curiosity to unlock novel solutions for complex global challenges (e.g., personalized medicine, sustainable energy, ethical AI).

Introduction

For centuries, academia has focused on disciplinary specialization, pursuing knowledge by dividing it into distinct specializations and fields. The explosion of specialized fields across various disciplines has accelerated dramatically since humanity began systematic engagement with research and innovation. The advent of new technologies has further boosted this drive (Khan et al., 2024a; Khan et al., 2024b; Khan et al., 2024c). This trend reflects an almost inevitable consequence of knowledge accumulation (Casadevall & Fang, 2014). This systematic fragmentation into distinct fields: physics, biology, sociology, engineering, and the humanities, has driven profound discovery, creating deep expertise within narrow domains. For example, the broad study of Biology is divided into specific fields like Molecular Biology, Genetics, and Ecology, each with its own specialized methods, journals, and experts. Similarly, Engineering now encompasses hyper-specialized areas such as aerospace structures, Robotics, Control Systems, and Nanotechnology.

This constant, self-driven subdivision, in the name of specialization, allows researchers to achieve greater depth, precision, and mastery over intricate problems (Abbott, 2002). It is driven not only by the scale of knowledge but also by the instrumentation revolution; new tools (e.g., electron microscopes, gene sequencers, particle accelerators) reveal trends that demand new, dedicated sub-specialties for their study. While this specialization has powered much of the unprecedented technological and scientific progress over the centuries, it has also created the intellectual knowledge banks that necessitate the current push for cross-disciplinary collaboration.

The most pressing challenges facing the 21st century, from climate change and global health pandemics to the ethical implications of artificial intelligence, are inherently complex problems that contest single-discipline solutions. These issues reside not within the boundaries of conventional departments, but within the gaps between them. Consequently, a quiet but profound transformation is underway: the shift toward cross-disciplinary research (CDR), also frequently termed interdisciplinarity, multidisciplinary, or transdisciplinary (Klein, 2008; Irfan-Maqsood, 2025).

This "unseen revolution" recognizes that true innovation often occurs at the boundaries of

knowledge, where disparate methodologies and approaches collide, integrate, and generate novel insights impossible to achieve in isolation. The core hypothesis driving this paper is that the deliberate cultivation and structural support of CDR are essential to unlocking research potential, accelerating societal progress, and preparing institutions to tackle the complexity of the modern world (Nicolini et al., 2012). A pictorial view of the hypothesis is depicted in Figure 1.

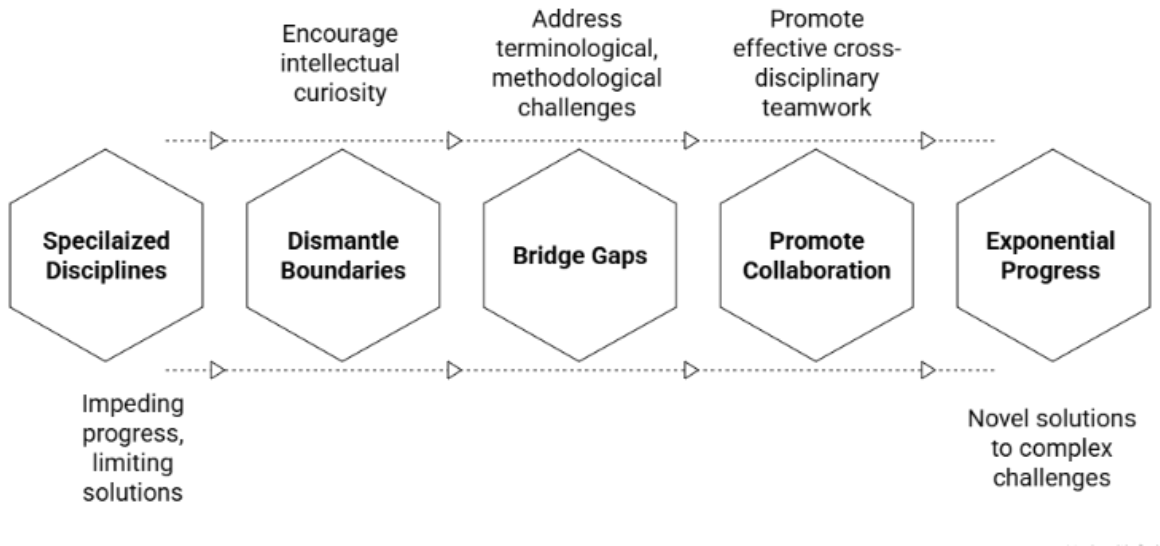


Figure 1. Unlocking Potential with Cross-Disciplinary Research

This paper provides an overview of the foundational literature surrounding the move toward fused research, first establishing the conceptual framework, then reviewing the documented benefits. Finally, it addresses the persistent institutional and structural barriers that prevent the full realization of Cross-Disciplinary Research's potential. By systematically examining how scholars from different traditions interact and integrate their knowledge, we aim to illuminate the necessary steps to move CDR from an irregular phenomenon to a systematic, well-supported modality of research.

Defining the Spectrum

The literature on research synthesis is rich but often fragmented, largely due to the varying terminology used to describe the collaborative process as shown in the Figure 2. It is vital to first establish the distinctions commonly made by scholars (Klein, 2008; Choi & Pak, 2006):

(a) Multidisciplinary (MD): Researchers from different disciplines work side-by-side on

a shared problem, but retain their field-specific objectives, methods, and results. The output is additive, not integrated.

(b) Interdisciplinary (ID): This involves a higher level of integration, where methodologies and concepts are deliberately blended to form a unified approach. The goal is synthesis, resulting in a new, shared framework.

(c) Transdisciplinary (TD): The most advanced form, which not only integrates academic disciplines but also includes non-academic stakeholders such as policymakers, community members, and industry leaders, in the research process from inception. The outcome is often translational and aimed at direct societal impact.

For this analysis, Cross-Disciplinary Research (CDR) will serve as an umbrella term encompassing ID and TD, focusing on projects that move beyond simple multidisciplinary co-location.

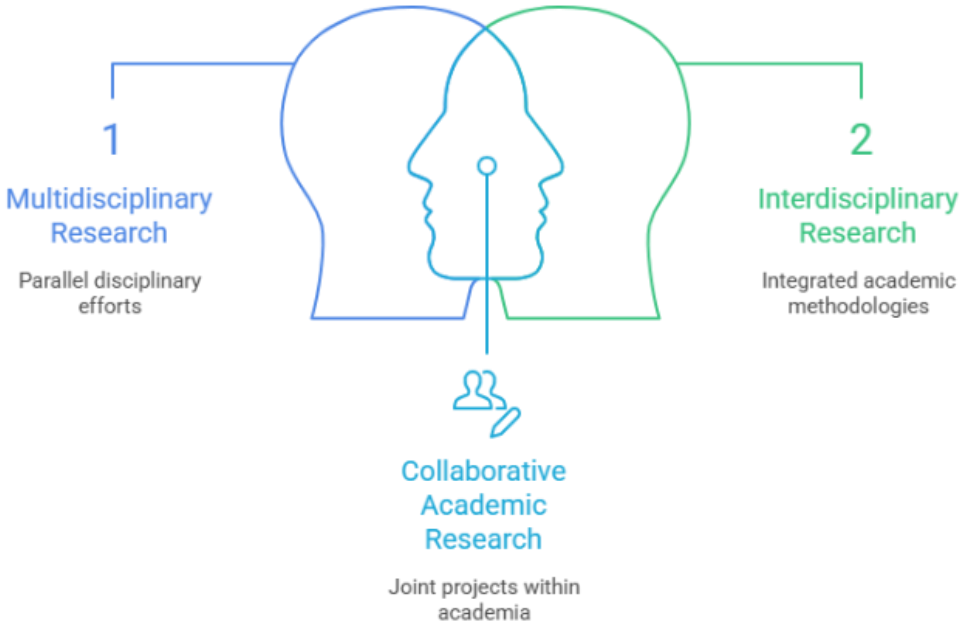


Figure 2. Levels of Research Integration

Addressing the Stagnant Innovation

Hyper-specialization, a hallmark of modern academia and industry, has led to an approach where experts delve deep into narrow fields. While this depth is valuable, it creates significant drawbacks. Researchers and practitioners in one area often lack awareness of tools, theories, and discoveries in others. This isolation leads to diminishing returns, where new research incrementally adds to a small body of knowledge rather than creating

transformative leaps. Innovation can stagnate because the most revolutionary ideas often come from applying a new perspective or a different field's methodology to an existing problem (De Saille & Medvecky, 2016). Without this interrelationship between disciplines, the resulting solutions tend to be predictable and merely incremental, failing to achieve the transformative leap necessary for major progress.

History is rich with examples of breakthroughs that were the direct result of cross-disciplinary collaboration.

(a) DNA Structure Discovery: The seminal work of James Watson and Francis Crick was not a purely biological endeavor (Schindler, 2008). It was a synthesis of knowledge from biology (the known properties of genetic material), chemistry (the molecular composition of nucleic acids), and most critically, physics (the use of X-ray crystallography by Rosalind Franklin and Maurice Wilkins to determine the molecule's structure). This blend of expertise was essential to visualizing the double helix, one of the most significant discoveries in science (Mirkin, 2008).

(b) Development of Modern Medicine: Modern medicine is a testament to convergence (Shryock, 1948). It is not just biology and chemistry, but also physics (for imaging technologies like MRI and X-rays), engineering (for medical devices and prosthetics), and computer science (for bioinformatics and diagnostic tools). For example, the invention of the stethoscope in the 19th century was an engineering solution to a medical problem, while the development of vaccines requires a deep understanding of microbiology, immunology, and public health policy (Fong, 2002).

Unseen Revolution in Action

The "Unseen Revolution" is a powerful concept because it's happening all around us, often without us realizing how different disciplines are merging to create something entirely new. Here are some compelling examples that highlight this cross-disciplinary action. The graphical representation of innovation through the merging of specialized disciplines is depicted in Figure 3.

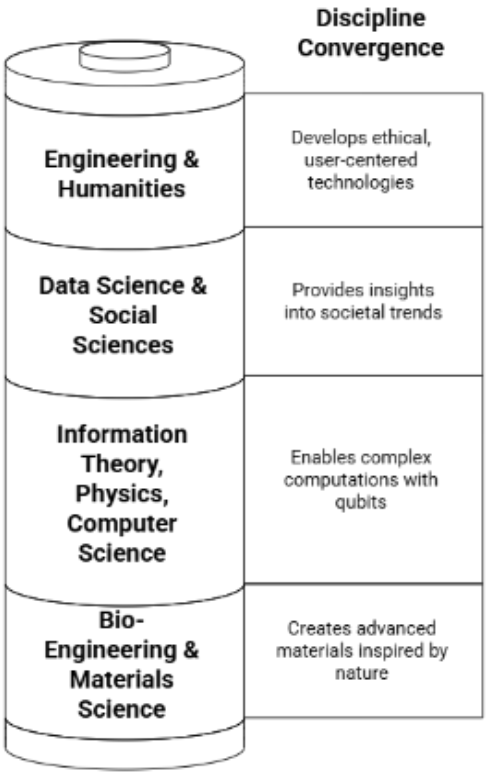


Figure 3. Innovation through Merging Disciplines

The Biomimetic Future

This convergence of Bio-Engineering and Materials Science involves looking at nature's designs to create advanced materials and devices (Narumi et al., 2022). Biomimetic materials are engineered to mimic biological structures and functions, leading to breakthroughs in medicine. Numerous applications can be found in different sub-fields of biomedicine, for example, researchers are developing materials that replicate the self-healing properties of skin or the strength of spider silk. In prosthetics, this fusion is creating next-generation limbs that are more than just functional replacements (Gregg & Sensinger, 2013). They integrate with the human body, providing sensory feedback and a more natural range of motion (Navaraj et al., 2019). This is achieved by utilizing advanced materials, such as shape-memory alloys and hydrogels, and incorporating engineering principles to design devices that are both biomechanically sound and aesthetically realistic.

The Quantum Leap

The collaboration between classical information theory, quantum physics, and computer

science is giving rise to a new era of computation, which encapsulates every field, stuffed with a higher computational burden for realistic solutions (Steane, 1998). While classical computers use bits that are either 0 or 1, quantum mainframes use qubits, which can be both 0 and 1 simultaneously (a state known as superposition) (Horowitz & Grumbling, 2019). This allows them to perform computations that are difficult for classical computers and holds the potential to solve some of the world's most complex problems. The application is spread over every sphere of life, such as quantum computing could revolutionize drug discovery by simulating the interactions of molecules at a level of detail currently impossible. In material science, it could lead to the development of new, more efficient materials for batteries or solar panels. The applications of this technology are unlimited and expanded to all spheres of life (Gill et al., 2022).

Understanding Human Behavior at Scale

The combination of data science with social sciences like sociology, urban planning, and psychology provides us with unprecedented insight into human behavior and societal trends. Big data analytics can be used to analyze vast datasets from sources like traffic sensors, social media, and satellite imagery to understand the dynamics of a city (George et al., 2016; Blok & Pedersen, 2014). Multiple uses of this understanding of human behavioral studies through this data can be used by urban planners to optimize traffic flow, predict crime hotspots, and design more efficient public transportation systems. Policymakers can use data-driven models to forecast the impact of new policies on a population, from public health initiatives to economic development programs. This convergence allows for more evidence-based decision-making that can improve the quality of life for millions of people (Sravanthi & Reddy, 2015; Ali et al., 2016).

Design for Humanity

The most impactful and enduring technologies go beyond mere functionality. They are designed to be natural, making them easy to understand and use without extensive instruction. They are developed with a strong ethical foundation, considering the broader social, environmental, and moral implications of their use (Sanders & Scott, 2020). Most importantly, they hold personal or societal meaning for users, addressing real needs, aligning with values, and enriching daily life in ways that resonate on a deeper level (Gabriel &

Ghazavi, 2022). This is where engineering and the humanities converge (Valenzuela-Aguilera et al., 2024). By incorporating insights from fields like philosophy, ethics, and design, engineers can create human-centered technologies. For instance, the rise of artificial intelligence (AI) has raised pressing ethical concerns, particularly around issues such as algorithmic bias, data privacy, and the question of who should be held accountable for AI-driven decisions. It's the job of philosophers and ethicists to collaborate with engineers in establishing guidelines and frameworks that ensure the responsible development of AI. Similarly, in product design, engineers collaborate with artists and designers to create technologies that are not only efficient but also aesthetically pleasing and emotionally resonant, leading to more enjoyable and effective user experiences (Valenzuela-Aguilera et al., 2024; Sun et al., 2024).

Strategies for Promoting Collaboration

Encouraging cross-disciplinary collaboration is not a passive process; it demands deliberate, coordinated efforts across various levels (Brown et al., 2019). At the institutional level, it involves creating policies, structures, and funding models that support and incentivize collaboration across departments and fields. Culturally, it requires cultivating an environment that values diverse perspectives and breaks down traditional academic or professional pillars (Aboelela et al., 2007). On an individual level, it calls for openness, curiosity, and a willingness to engage with unfamiliar ideas and methodologies.

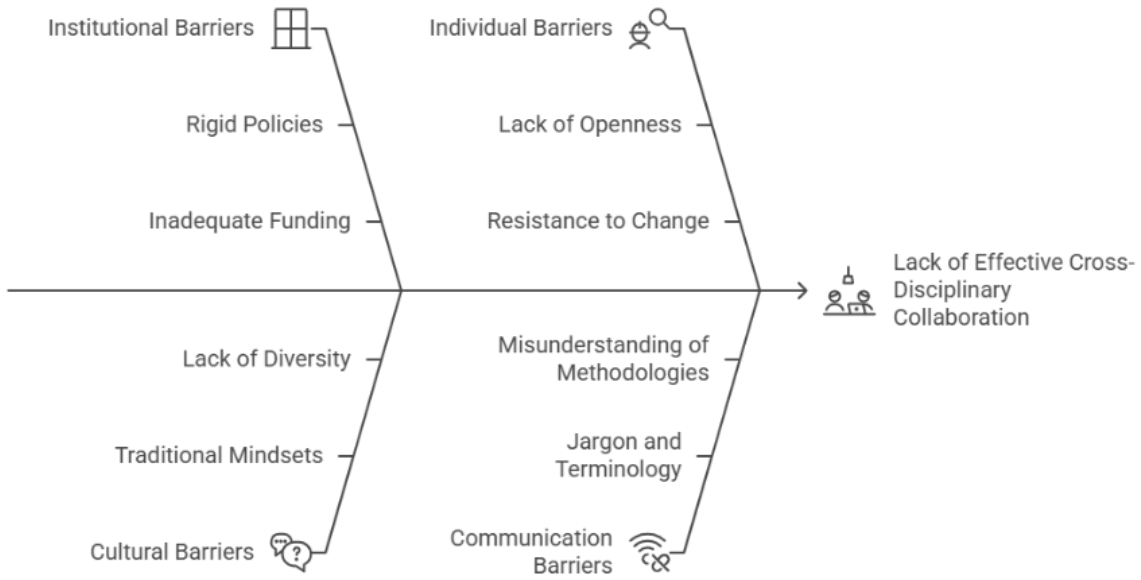


Figure 4. Barriers to Cross-Disciplinary Collaboration

The institutional and individual barriers to cross-disciplinary collaboration are highlighted in Figure 4. Together, these layers form the foundation for meaningful, sustained interdisciplinary work. For collaboration to flourish, the systems that govern research must be redesigned. Universities, research institutions, and funding agencies are the key players in this effort. Institutional and individual barriers are further elaborated in the subsequent paragraphs.

Breaking Down Institutional Barriers

- Universities and Research Institutions: These organizations can create interdisciplinary centers and institutes that physically and intellectually bring together researchers from different departments (Glied et al., 2007). They should also revise tenure and promotion criteria to value collaborative publications and projects, not just single-authored work. Providing seed funding for high-risk, interdisciplinary pilot projects and offering joint faculty appointments between departments can further incentivize collaboration.
- Funding Agencies: Grant-making bodies can play a pivotal role by prioritizing and creating specific funding calls for multidisciplinary proposals (Lyall et al., 2013). They can also simplify the application process for such grants, recognizing that a team of experts may have varied publication histories and methodologies. Funding agencies should also encourage applicants to include clear plans for collaboration and communication within their proposals.

Cultivating a Collaborative Mindset

While institutional changes provide the framework, the success of collaboration ultimately depends on the researchers themselves. A shift in mindset is crucial for paving the way forward to this change (Ahmed et al., 2024).

- Communication: Effective communication goes beyond simply exchanging information. It requires learning the "language" of another discipline, understanding their jargon, methodologies, and core assumptions. A materials scientist, for example, must learn to communicate their work in a way that a biologist can understand, and vice versa.

- Empathy: Researchers must practice compassion for their collaborators' perspectives

and challenges. Understanding the different timelines, publication norms, and intellectual goals of another field helps build trust and mutual respect, which are the foundations of any successful partnership.

• Intellectual Humility: Perhaps most importantly, researchers must have intellectual humility. This means acknowledging that one's own discipline does not hold all the answers and that a valid solution may come from an unexpected place. It involves a willingness to be a student again, learning from colleagues who are experts in different domains.

The Role of the Individual

Even in the absence of sweeping top-down institutional reforms, an individual researcher can still play a pivotal role in driving cross-disciplinary collaboration (Aagaard-Hansen, 2007). By actively seeking out connections with colleagues from other fields, initiating joint projects, and embracing diverse methodologies, researchers can help bridge disciplinary divides (Tarafdar & Davison, 2018). Their curiosity, openness, and initiative can inspire others to think beyond traditional boundaries, gradually building a culture of collaboration from the ground up. In this way, individual action becomes a powerful force for change, demonstrating that meaningful interdisciplinary work often begins with personal initiative.

• Attend Talks Outside Your Field: Take the initiative to step beyond your usual academic or professional circles by attending seminars, workshops, or conferences hosted by other departments or disciplines. These events offer a low-pressure, available opportunity to encounter fresh perspectives, unfamiliar methods, and emerging research that might not typically cross your radar. Engaging with ideas outside your immediate field can spark new insights and open the door to unexpected collaborations. Moreover, simply being present in these spaces allows you to connect with researchers who share an interest in interdisciplinary work, often the first step toward building meaningful, cross-cutting partnerships.

• Find Your "Broker": Seek out a colleague who possesses a wide and diverse professional network, particularly someone who regularly collaborates across different disciplines. Such individuals often act as “knowledge brokers,” people who can connect you with researchers, experts, and practitioners from other fields. By leveraging their connections, you can gain

access to fresh perspectives, methodologies, and insights that transcend traditional disciplinary boundaries. These brokers play a crucial role in bridging gaps between academic pillars, encouraging interdisciplinary dialogue, and enabling innovative collaborations that might not emerge within a single field alone.

• Frame Your Problem Differently: It is essential to reflect on the core questions driving your research. Consider whether a completely different discipline might offer fresh tools, perspectives, or theoretical frameworks to approach them. For instance, if someone's work in psychology explores memory, collaboration with a neuroscientist could reveal the underlying neural mechanisms, while partnering with a computer scientist might introduce innovative computational models for understanding cognitive processes. By looking beyond one's field, one can uncover new pathways to deepen and broaden the investigation.

• Propose a "Coffee Chat": Sometimes, all it takes is initiating an informal conversation with a researcher from another department to ignite the spark of collaboration. A casual exchange about their work can open unexpected avenues for joint exploration. It's about taking the first step to plant the seeds of connection that may grow into meaningful interdisciplinary partnerships.

The Acceleration of the Unseen Revolution

The "unseen revolution" of cross-disciplinary research is not a passing trend; it is the fundamental engine of future innovation (Karniouchina et al., 2006; Pennington, 2011). As our tools become more sophisticated and our problems more complex, the distance between disciplines will continue to shrink, leading to a profound acceleration in the pace of discovery. We can expect to see:

• The Rise of "Hybrid Fields": In the future, collaboration across disciplines will evolve beyond temporary partnerships to create entirely new, hybrid fields that stand on their own (Lemaine et al., 2012). These emerging domains will represent the permanent fusion of existing disciplines, combining their theories, ; Coccia, 2020). For example, Computational Social Science, a field that integrates data science, computer science, and social science, has already begun to establish itself as a distinct discipline, much like bioinformatics did in the past. Similarly, we can expect the formal emergence and institutionalization of areas such as

Neuro-robotics, which merges neuroscience with robotics; Sustainable Systems Engineering, which unites environmental science with advanced engineering principles; and Ethical AI Design, which bridges computer science, philosophy, and social ethics. These integrated disciplines will not only reshape academic departments but also redefine industry practices, leading to new paradigms for research, innovation, and education.

• Problem-Driven, Not Discipline-Driven, Research: Funding and research initiatives will increasingly be structured around addressing major global "majestic challenges" such as achieving net-zero emissions, advancing personalized medicine, and ensuring food and water security. Rather than being confined to traditional departmental or disciplinary pillars, research efforts will be mission-oriented, bringing together scientists, engineers, social scientists, and policymakers in collaborative, cross-sector ecosystems. This shift will not only advance innovation through the integration of diverse expertise but will also ensure that discoveries translate more directly into real-world solutions. As a result, the landscape of science and technology will evolve toward a more holistic, problem-driven paradigm that emphasizes societal impact, sustainability, and global collaboration.

• The Democratization of Knowledge: As researchers from increasingly diverse disciplines collaborate, the boundaries between fields will continue to blur, allowing methods, tools, and perspectives to flow more freely across traditional academic divides. This cross-pollination of ideas will substitute a dynamic and resilient research ecosystem, one that thrives on intellectual diversity and creative synthesis (Paquet, 2022). A breakthrough in materials science, for instance, might emerge from insights into behavioral economics about decision-making under uncertainty, while advances in neuroscience could inspire new models in artificial intelligence or robotics. Such interdisciplinary exchange will accelerate innovation, cultivate new hybrid fields of study, and enable researchers to tackle complex global problems with greater flexibility and imagination.

A Call to Action

The future of innovation will not be shaped by passive observers; it demands active participation and intentional effort from every researcher. True progress requires a conscious decision to dismantle the long-standing barriers that have divided disciplines and limited

collaboration. Each individual, whether an early-career scholar or a seasoned expert, must embrace the role of a catalyst for change, someone who seeks out connections beyond their traditional domain, learns the language of other fields, and contributes to a shared vision of integrated discovery.

Becoming a champion of cross-disciplinary collaboration means more than cooperating on projects; it involves cultivating intellectual curiosity, humility, and openness to new perspectives. It means recognizing that today's most pressing global challenges, climate change, sustainable energy, equitable healthcare, and ethical AI, cannot be solved through isolated expertise. The innovators of the future will be those who build bridges across disciplines, institutions, and cultures, creating a collaborative ecosystem where collective intelligence drives transformative breakthroughs.

The most exciting discoveries are waiting to be found, not in the depths of our existing spheres of interest, but in the open spaces between them. By embracing this unseen revolution, we can collectively unlock the potential to solve the world's greatest challenges and build a future that is more innovative, more equitable, and more humane.

Solving Today's Grand Challenges

In conclusion, the defining challenges of our time, climate change, global health crises, and the ethical governance of artificial intelligence are inherently multidisciplinary. They go beyond the boundaries of any single discipline, demanding integrated solutions that draw upon the collective expertise of science, technology, social understanding, and human values. Climate change, for example, cannot be addressed by environmental science alone. It requires engineers to design renewable energy systems, materials scientists to create efficient energy storage solutions, economists and political scientists to craft sustainable policies, and social scientists to influence the behaviors and choices that drive consumption and conservation. Only through this convergence can the human race move toward a resilient, low-carbon future.

Similarly, global health crises expose the need for deep collaboration across disciplines. Managing a pandemic is not solely the work of virologists or epidemiologists; it depends equally on statisticians to model spread, logisticians to ensure equitable vaccine distribution,

sociologists to unpack public perceptions, and communication experts to build trust and disseminate life-saving information. Such complexity can only be mastered through integrated, cross-disciplinary cooperation. The challenge of ethical AI further illustrates this imperative. While computer scientists design algorithms and data systems, the profound moral and societal implications of artificial intelligence call for the insights of philosophers, lawyers, psychologists, and sociologists. Together, these perspectives can ensure that AI evolves as a force for good, transparent, fair, and aligned with human well-being. Ultimately, the future of innovation and problem-solving depends on breaking free from disciplinary constraints and embracing a collaborative mindset. The world's grand challenges are interconnected, and so too must be the responses. Only through the fusion of diverse knowledge, methods, and perspectives can humans craft sustainable, ethical, and transformative solutions for the global community.

References

Aagaard-Hansen, J. (2007). The challenges of cross-disciplinary research. Social Epistemology, 21(4), 425–438. https://doi.org/10.1080/02691720701674134

Abbott, A. (2002). The disciplines and the future. In The future of the city of intellect: The changing American university (pp. 205–230).

Aboelela, S. W., et al. (2007). Defining interdisciplinary research: Conclusions from a critical review of the literature. Health Services Research, 42(1), 329–346. https://doi.org/10.1111/j.1475-6773.2006.00618.x

Ahmed, M. S., Das, M. P. J., & Laskar, M. M. A. (2024). Interdisciplinary collaboration in research. In Modern trends in multi-disciplinary research (Vol. 1).

Ali, A., Qadir, J., Rasool, R. U., Sathiaseelan, A., Zwitter, A., & Crowcroft, J. (2016). Big data for development: Applications and techniques. Big Data Analytics, 1(1), Article 2. https://doi.org/10.1186/s41044-016-0002-4

Areekkuzhiyil, S. (2017). Emergence of new disciplines. Online submission.

Blok, A., & Pedersen, M. A. (2014). Complementary social science? Quali-quantitative experiments in a big data world. Big Data & Society, 1(2). https://doi.org/10.1177/2053951714543908

Brown, R., Werbeloff, L., & Raven, R. (2019). Interdisciplinary research and impact. Global Challenges, 3(4), 1900020. https://doi.org/10.1002/gch2.201900020

Casadevall, A., & Fang, F. C. (2014). Specialized science. Infection and Immunity, 82(4), 1355–1360. https://doi.org/10.1128/IAI.01574-13

Choi, B. C. K., & Pak, A. W. P. (2006). Multidisciplinarity, interdisciplinarity and transdisciplinarity in health research, services, education and policy. Clinical & Investigative Medicine, 29(6), 351–364.

Coccia, M. (2020). The evolution of scientific disciplines in applied sciences: Dynamics and empirical properties of experimental physics. Scientometrics, 124(1), 451–487. https://doi.org/10.1007/s11192-020-03461-y

De Saille, S., & Medvecky, F. (2016). Innovation for a steady state: A case for responsible stagnation. Economy and Society, 45(1), 1–23. https://doi.org/10.1080/03085147.2016.1143725

Fong, H. H. (2002). Integration of herbal medicine into modern medical practices: Issues and prospects. Integrative Cancer Therapies, 1(3), 287–293. https://doi.org/10.1177/153473540200100312

Gabriel, I., & Ghazavi, V. (2022). The challenge of value alignment. In The Oxford handbook of digital ethics (pp. 336–355). Oxford University Press.

George, G., Osinga, E. C., Lavie, D., & Scott, B. A. (2016). Big data and data science methods for management research. Academy of Management Journal, 59(5), 1493–1507. https://doi.org/10.5465/amj.2016.4005

Gill, S. S., et al. (2022). Quantum computing: A taxonomy, systematic review and future directions. Software: Practice and Experience, 52(1), 66–114. https://doi.org/10.1002/spe.3031

Glied, S., Bakken, S., Formicola, A., Gebbie, K., & Larson, E. L. (2007). Institutional challenges of interdisciplinary research centers. Journal of Research Administration, 38(2), 28–36.

Gregg, R. D., & Sensinger, J. W. (2013). Towards biomimetic virtual constraint control of a powered prosthetic leg. IEEE Transactions on Control Systems Technology, 22(1), 246–254. https://doi.org/10.1109/TCST.2013.2251877

Guglielmelli, E., et al. (1996). Humans and technologies at home: From friendly appliances to robotic interfaces. In Proceedings of the IEEE International Workshop on Robot and Human Communication (RO-MAN'96) (pp. 71–79). IEEE.

Horowitz, M., & Grumbling, E. (2019). Quantum computing: Progress and prospects. National Academies Press.

Igbinenikaro, O. P., Adekoya, O. O., & Etukudoh, E. A. (2024). Fostering cross-disciplinary

collaboration in offshore projects: Strategies and best practices. International Journal of Management & Entrepreneurship Research, 6(4), 1176–1189.

Irfan-Maqsood, M. (2025). Multidisciplinary vs. interdisciplinary vs. transdisciplinary approaches: Key differences and in-depth analysis. IMAQ Journal, 2, 44–48.

Karniouchina, E. V., Victorino, L., & Verma, R. (2006). Product and service innovation: Ideas for future cross-disciplinary research.

Khan, A. A., Hussain, T., Pillai, J. R., Al Siyabi, M., & Al Shibli, A. (2024, October 20–23). Use of adequate technology to attain engineering graduate attributes. Paper presented at the International Conference on Studies in Engineering, Science and Technology, Antalya, Turkey.

Khan, A. A., Hussain, T., Al Siyabi, M., Al Shibli, A., & Hussain, S. (2024). Challenges and prospects of cutting-edge technology in education. In S. M. Ozturk & M. Koc (Eds.), Studies on education, science and technology 2024 (Vol. 1, Chapter 6, pp. 104–121). ISTES Organization.

Khan, A. A., Hussain, T., Al Siyabi, M., Al Shibli, A., & Afzal, A. (2024). Futuristic digital technologies and engineering competencies. In A. A. Khan & O. T. Ozturk (Eds.), Studies on social and education sciences 2024 (Vol. 1, Chapter 8, pp. 150–171). ISTES Organization.

Klein, J. T. (2008). Evaluation of interdisciplinary and transdisciplinary research: A literature review. American Journal of Preventive Medicine, 35(2), S116–S123. https://doi.org/10.1016/j.amepre.2008.05.010

Lemaine, G., Macleod, R., Mulkay, M., & Weingart, P. (2012). Perspectives on the emergence of scientific disciplines. Walter de Gruyter.

Lyall, C., Bruce, A., Marsden, W., & Meagher, L. (2013). The role of funding agencies in creating interdisciplinary knowledge. Science and Public Policy, 40(1), 62–71. https://doi.org/10.1093/scipol/scs121

Mirkin, S. M. (2008). Discovery of alternative DNA structures: A heroic decade (1979–1989). Frontiers in Bioscience, 13, 1064–1071.

Narumi, S., Huang, X., Lee, J., Kambara, H., Kang, Y., & Shin, D. (2022). A design of biomimetic prosthetic hand. Actuators, 11(6), 167. https://doi.org/10.3390/act11060167

Navaraj, W. T., Nassar, H., & Dahiya, R. (2019). Prosthetic hand with biomimetic tactile sensing and force feedback. In Proceedings of the IEEE International Symposium on

Circuits and Systems (ISCAS) (pp. 1–4). IEEE.

Nicolini, D., Mengis, J., & Swan, J. (2012). Understanding the role of objects in cross-disciplinary collaboration. Organization Science, 23(3), 612–629. https://doi.org/10.1287/orsc.1110.0664

Paquet, E. (2022). The impact of background diversity on researcher innovation.

Pennington, D. D. (2011). Collaborative, cross-disciplinary learning and co-emergent innovation in eScience teams. Earth Science Informatics, 4(2), 55–68. https://doi.org/10.1007/s12145-011-0086-7

Sanders, D., & Scott, P. (2020). Technological interventions and their impact on quality of life for people living with dementia: A literature review. BMJ Health & Care Informatics, 27(1), e100064. https://doi.org/10.1136/bmjhci-2019-100064

Schindler, S. (2008). Model, theory, and evidence in the discovery of the DNA structure. British Journal for the Philosophy of Science, 59(3), 619–658.

Shryock, R. H. (1948). The development of modern medicine. Lippincott Williams & Wilkins.

Sravanthi, K., & Reddy, T. S. (2015). Applications of big data in various fields. International Journal of Computer Science and Information Technologies, 6(5), 4629–4632.

Steane, A. (1998). Quantum computing. Reports on Progress in Physics, 61(2), 117–173. https://doi.org/10.1088/0034-4885/61/2/002

Sun, Q., Li, Y., Alturki, E., Murthy, S. M. K., & Schuller, B. W. (2024). Towards friendly AI: A comprehensive review and new perspectives on human–AI alignment. arXiv. https://arxiv.org/abs/2412.15114

Tarafdar, M., & Davison, R. M. (2018). Research in information systems: Intra-disciplinary and inter-disciplinary approaches. Journal of the Association for Information Systems, 19(6), 523–551.

Valenzuela-Aguilera, A., Romero-Tecua, G., Aguilar-Velázquez, D., & Islas, I. R. (2024). Smart cities: Aligning tech efficiency with social justice. SN Computer Science, 5(8), 997. https://doi.org/10.1007/s42979-024-02761-6

Author Information

Abid Ali Khan
https://orcid.org/0000-0001-7763-1490
Military Technological College
Al Matar Street, Muscat
Oman
Contact e-mail: *abid.khan@mtc.edu.com*

Tariq Hussain
https://orcid.org/0000-0001-9975-8986
Military Technological College
Al Matar Street, Muscat
Oman

Aftab Afzal
https://orcid.org/0009-0002-4650-723X
Military Technological College
Al Matar Street, Muscat
Oman

Mohamed Al Siyabi
https://orcid.org/0000-0003-4898-9234
Military Technological College
Al Matar Street, Muscat
Oman

Citation

Khan, A. A., Hussain, T., Afzal, A., & Al Siyabi, M. (2025). The Unseen Revolution: Unlocking the Potential of Cross-Disciplinary Research. In M. Koc & O. T. Ozturk (Eds.), *Studies on Social and Education Sciences 2025* (pp. 104-121). ISTES.

Chapter 4 - The First Women Painters ın Turkish Painting and Their Development

Derya Özdemir Kibici

Chapter Highlights

- The emergence of women painters in Türkiye and the rise of their talents in painting coincided with the early years of the 20th century, during the decline of the Ottoman Empire.
- The 1908 Constitutional Monarchy, which brought a new order to Türkiye's political life, heralded a regime focused on women's rights.
- Throughout the period from the Constitutional Monarchy to the Republic, women cultivated and advanced in painting, a fine art form.
- Among these artists are Mihri Rasim, Vildan Gizer, Müfide Kadrim, Celile Hikmet Enver Uguraldim, Emine Fuat Tugay, Naciye Tevfik, and Meliha Zafir.
- These artists, distinguished as women artists, have earned a significant place in the history of Turkish painting.
- The first women painters in Turkish painting were key players in the transformation of the country's art history, both in terms of artistic production and education and pedagogy.
- The artistic and academic community is increasingly re-evaluating these figures, but more in-depth archival, technical and comparative studies are needed.

Introduction

Among the latest to develop in Turkish society are the fine arts departments, painting, and sculpture. The significant gap between Turkey and the West in these art forms was quickly bridged thanks to the rare works produced by the intelligence and creativity of the Turkish people (Ciddi, 2025; Ceran, 2022, 2025; Çakır et al., 2019; Kibici, 2022, 2025; Ozkan & Erdem, 2025; Tekin, 2025; Turgut & Ozturk, 2025). For this reason, the Western world, albeit belatedly, had the opportunity to become intimately acquainted with the vibrant and creative works of the Turks. For Turks, who lived for many years in a life where painting was considered a sin and painting was despised, the fact that women were at the forefront of an art form ostracized by society was considered unacceptable. Looking back at the history of civilization, women of every nation, like wagons attached to a locomotive, have reached their current level by following men. However, as in every subsequent field, the discriminatory views and practices of women in the arts have been buried in the pages of history (Toros, 1988).

Turkish society was very late in providing women with the education and training they deserved. While the foundations laid by Minister of Education Abdurrahman Sami Pasha and Grand Vizier Saffet Pasha, who opened some schools for girls in the second half of the century, were significantly improved after the 1908 Constitutional Revolution, and cultural buildings were built, the process only reached its intended peak during the Republican era. The empowerment, legal existence, and value of Turkish women in all areas were thanks to the reforms that began with the Republican regime. The Turkish Revolution established gender equality as a requirement of civilization (İpek, 1996; Kancı, 2008).

Within this civilizational movement, Turkish painters who were trained also found the opportunity to use their magic brushes in the world of color, achieving a commendable level in their profession. It is known that, within the narrow and conservative views of the Sultanate period, a few courageous Turkish girls, driven by the passion of their God-given talents, pursued their education in the art centers of Europe.

The modernization process of Turkish painting took shape in parallel with Westernization movements in the late 19th and early 20th centuries (Golonu, 2017; Pome, 2017). One of the

most significant aspects of this transformation, and one that is increasingly gaining attention in the international art community, is the emergence of the first professional female painters. This article aims to examine how international academics and art critics evaluate these pioneering female artists, who emerged during the transition from the Ottoman Empire to the Republic of Turkey, and their place in Turkish art. International literature generally analyzes these artists through the themes of "modernity," "identity construction," "gender," and "cultural synthesis."

Our first famous painter, whose many caricatures and drawings were published in Paris, is "Mihri Rasim". Later, "Celile" and "Vildan Gizer" also benefited from Western education. Talented Turkish women unable to travel abroad successfully mastered their brushwork by taking private lessons from renowned Turkish and foreign artists in Istanbul. It is observed that during the period when Turkish painting gravitated towards Western styles and was influenced by them, our female painters also began to work in art. From our first generation to the present day, the number of female painters has steadily increased. Parallel to the gradual rise of Western-oriented institutions in society, they have been breaking away from the traditional patterns and values of daily life and establishing themselves alongside their male counterparts. During the Tanzimat period, when Westernization movements began intensifying, women's place in society was inevitably in question. With the establishment of the Republic, this place was secured by certain legal principles, and women's role and function as social beings became more and more clear. Turkish women, who exercised their influence in the political arena through their freedom to vote and be elected, played a significant role in the development of contemporary cultural values and in young Türkiye's contribution to these values (Özsezgin, 1976). Furthermore, they served as a source of inspiration for subsequent female artists (Karaoğlu & Kara, 2014).

International academic opinion recognizes figures such as Mihri Müşfik (Mihri Rasim), Müfide Kadri, Güzin Duran and Nazlı Ecevit as pioneering figures not only in Türkiye but also in the broader Islamic world and the Middle East. These artists were the first generation to receive artistic training and exhibit their works publicly (Çalıkoğlu, 2011).

In her work, Ottoman Painting: Reflections of Western Art from the Ottoman Empire to the Turkish Republic, art historian and curator Wendy M. K. Shaw (2011) sees the emergence of

these women as a consequence of Ottoman modernization ("Tanzimat"). According to Shaw, women's access to art education first began within the imperial palace and later expanded through institutional structures such as the İnas Sanayi-i Nefise School (Girls' Fine Arts School). Shaw highlights Mihri Müşfik as a key figure who contributed to the democratization of art education, not only as a painter but also as the founding director of this school (Shaw, 2011).

Foreign art critics often interpret the works of these first Turkish women painters through a dialogue between "East" and "West," "traditional" and "modern." Portrait and Subjectivity: In her article "Painting and Women in Late Ottoman Times," art historian Burcu Pelvanoğlu (2017) highlights the importance of Mihri Müşfik's portraits. According to Pelvanoğlu, Müşfik's portraits of women represent a radical departure from the anonymous and typified depictions of women in traditional Ottoman miniature art. These portraits reflect individual subjectivity, inner worlds, and a modern search for identity. In Western art historical terminology, this can be interpreted as the "birth of the individual" (as cited in Germaner & İnankur, 2017).

Landscape and the Construction of Identity: In their collaborative work, Ottoman Painting in the 19th Century, Semra Germaner and Zeynep İnankur (2002), while examining the general characteristics of painting in this period, also touch upon landscape paintings by women painters. According to them, these works, depicting scenes from the Bosphorus and everyday life, played a role in the construction of a new national and modern aesthetic. The depiction of the local landscape with Western techniques (perspective, oil painting) contributed to the formation of the visual memory of modern Türkiye (Germaner & İnankur, 2002).

First Turkish Women Painters

Mihri Rasim

Although not much is known about her, Ms. Mihri is recorded in historical records as our first female painter. Born in 1886 in the Dr. Rasim Pasha Mansion in the Bahariye district of Kadıköy, Istanbul, Ms. Mihri's father was Dr. Çerkez Ahmet Rasim Pasha, who taught at the Military Medical School and was also known as the Minister of Medicine or Head of the Medical School. The painter, who received a European education, was also interested in

literature and music. When she presented a painting she had painted to Sultan Abdülhamid II, she became a student of the palace painter Zonaro and took painting lessons from him in his studio in Beşiktaş. Thus, she became the first female painter to initiate contemporary painting in Turkey (Önen, 2021). Besides Mihri Hanım, there was another woman artist even more prominent than her. This artist is known as Ms. Celile. Her works include pastels, oil paintings, and engravings. Ms. Mihri is considered the first Turkish female painter due to the lack of sensitivity to this art form, which was a result of other female artists leaving for Paris in 1906. From another perspective, Ms. Mihri is important as the first female professor at the School of Fine Arts, which was first opened for women and young girls during the reign of Sultan Reşat.

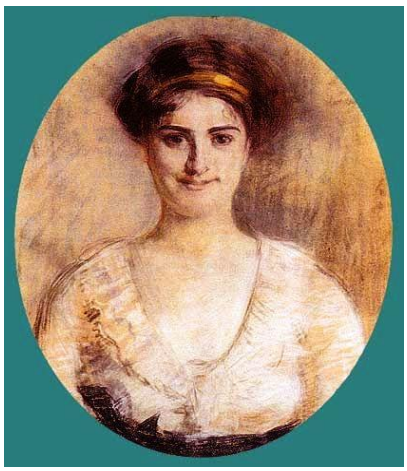


Figure 1. Mihri Rasim, Portrait of a Woman

Figure 2**.** Mihri Rasim, Portrait of a Woman

Ms. Mihri is also a renowned Turkish female painter, both nationally and internationally. She

has painted portraits of many well-known figures in Istanbul, as well as in Rome, Paris, and the United States (Toros, 1988).

Figure 3. Mihri Rasim, Portrait of Ms. Naile (http://ucelma.blogspot.com.tr/2010/12/tarihte-ilk-turk-kadn-ressammihri.html.)

At seventeen, she followed a music conductor of Italian origin to Rome, whom she met at a music concert. After spending some time with acquaintances in Italy, where she went with a fake passport, she moved to Paris, considered the center of the art world. She rented a place at 52 Montparnasse Boulevard, which she used as both a home and a workshop. She made a living by painting primarily portraits and engravings, and by renting one of her rooms in her house. One of her tenants was Mr. Müşfik Selami, who was studying Political Science at the Sorbonne under the leadership of Bursalı Selami Pasha.

Marrying Mr. Müşfik Selami (Form İnegöl), Ms. Mihri thus became known in the art world as "Ms. Mihri Müşfik". She separated from Mr. Müşfik Selami in 1922. Educated at various art schools and workshops in Italy and France, Ms. Mihri Müşfik painted original portraits with an expressionist approach. She closely followed contemporary painting trends. The influence of cubism and expressionism is evident in her portraits. He created the portrait of "Naile Hanım," considered his most important work, during a long period between 1908 and 1909. The work depicts Ms. Naile, the mother of Mr. Ali Rıza, one of the founders of the Committee of Union and Progress, former ambassador to Vienna, and mayor of Istanbul. After the Balkan War, Mr. Cavit, the then Minister of Finance, who went to Paris to negotiate a debt with the French, met the painter Ms. Mihri during a reception at the Turkish embassy.

The Minister, in a telegram, suggested to the Minister of Education that such a talented woman should be utilized, given that the Committee of Union and Progress was implementing a western-oriented education system. Consequently, Ms. Mihri was appointed art teacher at the Istanbul Darül Muallimat Girls' Teachers' School in 1913. During the reign of Sultan Reşat, in the first year of World War I, the "İnas Sanayi-i Nefise School-for girls" (Inas Sanayi-i Nefise Mektebi) was opened. He started working at this school with Mr. Ömer Adil in 1914.

Figure 4**.** Mihri Rasim, Portrait of Mustafa Kemal Atatürk.
http://ucelma.blogspot.com.tr/2010/12/tarihte-ilk-turk-kadn-ressammihri.html

Following the War of Independence, during the founding days of the Republic, Ms. Mihri enthusiastically painted a portrait of Mustafa Kemal Atatürk, which she personally brought to Çankaya to present to Atatürk. The artist, who participated in world expositions in 1938, 1939, and 1943, later settled in the United States and continued her career by giving private lessons to wealthy American citizens. As was often the case with many renowned painters, after losing her ability to work, the artist spent the final years of her life in hardship and poverty. She passed away in 1954. Noted for her portraits and still-life works, the artist's works are held in museums and private collections.

Vildan Gizer

She was the grandson of the famous printer Mr. Osman. His grandfather was Mr. Osman, the Chief Chamberlain of Sultan Abdulhamid. He was also known as Printer Mr. Osman. The Mr. Osman district in Istanbul takes its name from Mr. Osman (Berberoğlu, 2024).

Figure 5. Vildan Gizer Portrait Study (Toros, 1983).

Mr. Osman, whom Sultan Abdulhamid II knew during his princedom, later bore the title of Ser Kurena-Yı Hazret-ı Shahyari. He published the Quran for the first time with the special permission he received from the Sultan. Until that date, the reproduction of the Quran by printing was prohibited. His son, Mr. Ömer Vasfi (1864-1895), was a painter and calligrapher. He died of tuberculosis at a young age while working at the Ministry of Foreign Affairs. The painter Ms. Vildan, whom we are discussing, is the daughter of this painter and calligrapher. Her inclination towards fine arts comes from her lineage. Ms. Vildan took painting lessons from Salvatore Valeri, one of the Italian professors of the Academy. She was married off to her brother-in-law, Mr. Dr. Hikmet, by the poet Tevfik Fikret (Toros, 1983: 34). Dr. Hikmet Gizer (1881-1966) was the cousin and brother-in-law of the poet Tevfik Fikret.

Figure 6. John Ammi Adams, Portrait of Vildan Gizer-1919 (Toros, 1983).

Dr. Hikmet Gizer, in addition to his medical education in Istanbul and Berlin, possessed exceptional talent in painting and architecture. He produced numerous paintings and house plans, as well as a portrait of his brother Nazıma, wife of Tevfik Fikret. Sent to Austria, our ally, during World War II, Dr. Hikmet served as the Turkish representative of the Red Cross in Vienna. His wife, Ms. Vildan, had the opportunity to develop her painting, which she had begun in Istanbul in her youth, in Vienna. It is observed that Ms. Vildan possessed a skilled brush, primarily in portraiture. In her culturally oriented life, she modestly neither exhibited nor published her works. She was a contemporary and closest friend of the painter Müfide Kadri, who died young. Vildan Gizer died in Istanbul in 1974. All of her pastel and oil paintings are in the collections of her daughters, Hilkat and Ms. Rikkat. Prof. Dr. Gizer, retired dean of the Technical University, is a member of the Istanbul Technical University. Sait Kuran is the son-in-law of our painter (Toros, 1983).

Müfide Kadri

Ms. Müfide Kadri was born in Istanbul in 1889. Her father, Mr. Kadri, was a religious scholar known for his vast fortune and managed all the accounting affairs of Altuni Zade.

After Müfide's birth, her mother died of tuberculosis. Mr. Kadri, who had no children, adopted her. Müfide received her education privately. She never attended any school. She possessed astonishing talent in almost every branch of the fine arts. Over the years, Müfide's talent in painting came to the fore. By chance, museum director Mr. Hamdi took an interest in her after seeing a painting of hers. Recognizing Müfide's inherent talent, Mr. Hamdi gave her private lessons (Toros, 1988).

Admired by the museum director, painter Mr. Osman Hamdi, Müfide Kadri's talent was also recognized by Professor Valeri of Italian descent at the Academy of Fine Arts. He gave Müfide pencil and watercolor lessons and even used one of her paintings in a group exhibition. One of Müfide's paintings won an award in Germany. Müfide's exceptional talent in painting led her to become the first female teacher in this profession. She was appointed first to Numune Schools and then to the Numune-i İnas girls' school in Süleymaniye. She taught painting, embroidery, and music at İnas Junior High School and İnas High School.

This talent was evident between the ages of 5 and 9. Her involvement with music enriched her cultural heritage. Along with her proficiency on the oud, violin, kemenche, and piano, she also composed astonishing compositions. This unprecedented achievement for a girl of her age garnered the admiration of intellectual circles.

Her composition, Terane-i Şebab, with lyrics by Mr. Ali Sabahattin, was published in the renowned art magazines of the time. She died at the tender age of 22, succumbing to tuberculosis, contracted from her mother as a baby. According to a record found among the papers of Mr. Hüseyin Nakip, a calligrapher and painter who served as the personal secretary of the last caliph until his death, Ms. Müfide passed away on the 14th night of the month of Shaban in the 1330s.

Because that day coincided with the holy night of Berat Kandili, the fact that an artist girl passed away on that night was interpreted by those around her as a sacred fate. Müfide Kadri never married. At one point, there was consideration for her to marry Sami Yetik, one of our renowned military painters, but her advanced tuberculosis prevented such a plan.

Figure 7. Müfide Kadri, Portrait of Güzin Duran, at 13 Years Old-1910 (Toros, 1988).

While painting and music were shining in the skies of our world, a shooting star, bearing a hand-embroidered shawl on her coffin, plunged those around her into a hazy sorrow. The cultural newspapers and magazines of the time published rather sorrowful articles on Müfide Kadri's death (Toros, 1988: 21). The most moving were those published in Rebap by Fahriye Osman and Nejat Tahsin, who taught at the same school as her. Müfide, who possessed an extraordinary artistic talent, had her death deeply impacted Istanbul's intellectual circles. The Ottoman Painters' Society commissioned an ornate tomb in her memory. They commissioned a palette to be painted on the head of the marble stone, which served as a monument to art. This was the first time in Turkey that a painter's professional symbol was placed on her grave. Two of her works are housed in the Istanbul State Museum of Painting and Sculpture. One of these is a romantic 1907 painting titled "Love on the Shore." The other is the 13-year-old portrait of Güzin Duran, one of our well-known female painters who later became one of the first students of the Academy of Fine Arts.

Celile Hikmet Uğuraldim

Ms. Celile was born in Istanbul in 1883. She was of German and Polish ancestry. Her father was Enver Pasha, an aide-de-camp to Sultan Abdulhamid II. He was the son of Mustafa Celaleddin Pasha, who had defected to Turkey during the Polish Revolution, converted to

Islam, and was martyred during his heroic service in the Turkish army. Her mother, Ms. Leyla, was the daughter of Müşir Ahmet Ali Pasha, who had also sought refuge in Turkey, although she was of German origin. Ms. Celile was raised by private foreign governesses. She was educated by her father, Enver Pasha, who had spent his youth in Paris and was fluent in several languages. Because Enver Pasha was at one time the Sultan's aide-de-camp, Ms. Celile 's close friendship with the Palace Painter Zonaro enabled her to take private lessons from the Sultan's painter. In later years, she continued her studies and education in Rome and Paris (Toros, 1988). She married Mr. Hikmet in 1900. Mr. Hikmet was the son of Nazım Pasha, one of the famous governors and poets of Sufi literature. His marriage to Ms. Celile and Mr. Hikmet ended in divorce towards the end of World War I.

After this separation, Ms. Celile devoted herself entirely to painting and traveled to Berlin for a time, studying in galleries, workshops, and museums. Ms. Celile, who primarily worked with portraits and nudes, was known as Celile Enver in her youth, after her father, Enver Pasha, of Polish origin. Upon marriage, she added her husband's name, becoming Celile Hikmet. According to surname law, she chose the surname "Uğuraldım" (I Was Uğuraldım). While this name cannot be said to have brought her much good fortune, Ms. Celile endured a life of great sorrow and suffering due to family circumstances, and passed away in Ankara in 1956.

Ms. Celile was the mother of the poet Nazım Hikmet. Ms. Celile, whose portraiture was a major focus, painted her most beautiful portraits of her family. A portrait of his mother, Ms. Leyla, is in the museum. His own portrait, along with portraits of his son, grandson, and nephew, are among his most successful works. He also has numerous works on nudes, women's baths, and Gypsies.

Emine Fuat Tugay

Coming from a lineage steeped in the richness of Eastern and Western cultures, Emine Fuat is one of the enlightened women of our time. She is one of the last heirs of a family whose roots lie in the Egyptian dynasty and in the renowned statesmen of our history. She is the granddaughter of Grand Vizier Gazi Ahmet Muhtar Pasha, head of the Grand Cabinet and a hero of the Russo-Turkish War, and the daughter of Mahmut Muhtar Pasha, Minister of the

Navy in the same cabinet. Her mother was Princess Nimetullah, daughter of the Khedive of Egypt, Ismail Pasha. Ms. Emine Dürüye was born in Istanbul in 1897. Her three siblings, Nizameddin, Mehmet Ali, and Kemal, died of cancer at a young age (Akçay, 2015).

Figure 8. Emine Fuat Tugay, Her husband, Hulusi Fuat Tugay - Oil on Canvas (Toros, 1988).

Ms. Emine received her primary education privately. She studied foreign languages at a young age and took painting lessons from Prof. Albert Mille (Toros, 1988). Due to her talent in the fine arts, she completed her higher education at the Zurich School of Fine Arts in 1918. Ms. Emine married Ahmet Hulusi Fuat in Munich on September 15, 1921. Mr. Hulusi was the son of Fuat Pasha, a heroic figure in recent political and military history whose reputation was infamous for his reckless speeches to Sultan Abdulhamid's face, his harsh stance on the battlefield, and his sharp intellect. Originally a doctor, Hulusi Fuat was, at the time, the assistant of the renowned Prof. Dr. Akil Muhtar (Mr.). Due to his inclination towards diplomacy, he served in the Foreign Ministry. His first posting was as the chargé d'affaires in Copenhagen in 1922. Hulusi Fuat Tugay, who later became Ambassador; She represented Turkey in Romania, Spain, China, Japan, and Egypt. Emine Fuat Tugay earned respect in various countries as a culturally oriented ambassador. She used her pen and brush, albeit sparingly, in the places she visited. Her Istanbul home featured works by renowned painters. Ms. Emine was also known for her meaningful philanthropy. Extending her helping hand to

animals, she was one of the founders of the Society for the Protection of Animals.

The work that brought her international fame was her book "Threl Centuries," written in English and published by Oxford University. This work realistically portrays the lives of prominent Turkish and Egyptian families in old Turkish mansions. While she was preparing for the second edition of this valuable book, following an offer from London, Emine Tugay passed away. She died in 1975. She was one of the last women to study painting in Europe during the sultanate. Ms. Emine, who primarily painted portraits, has her works in her close family, in Egypt, and among the families of former diplomats abroad.

Naciye Tevfik and Meliha Zafir

They were a mother and daughter who used a brush in the past, composed works inspired by Western music, and wrote poems in French. These intellectual and artistic women were the painter Naciye Tevfik and her daughter Meliha Yenerden (Toros, 1988). Naciye Tevfik began using the brush in the late 19th century and continued to do so into the 20th century. Her husband, Mr. Tevfik Hamdi, was a prominent statesman of the sultanate. He served as governor of Yemen, Konya, Thessaloniki, and Bursa. He also served as minister of the Court of Accounts and the Council of State. He taught constitutional law at the Faculty of Law and economics at the School of Engineering. His 91 years of life (1867-1958) were spent in public service and scholarly pursuits. Ms. Naciye possessed a culture that aligned with her husband's. She capitalized on her talent and artistic inclinations through her brush. Naciye Tevfik (1878-1960), who painted flowers and portraits, was instrumental in educating her daughter, Meliha Yenerden, in every branch of the fine arts. Like her mother, Meliha Yenerden (1896-1979), a cultured woman, painted, studied music in France, and wrote French poetry. In her writings, she used the pen names Zeynep Aksel, Hatice Yenerden, Meliha Zafir, and Neyyal Şahsuvar (Toros, 1988: 40).

Academic and Artistic Views of the İnternational Art Community

Studies on early Turkish women painters in international literature follow two main lines: (1) efforts by women artists to rediscover "missing/erased" heroes (recovery studies) and (2) reading works from the perspectives of modernism, orientalism, and postcolonialism in terms

of form/theme. As figures such as Mihri and Fahrelnissa were re-evaluated in Western exhibitions and museum collections (retrospectives, catalogs), an increase in international academic interest was observed. These studies also brought into question the issue of gender-based invisibility (Berger, 2011; Burke, 2014; Pelvanoğlu, 2013). International art history literature generally explains the development of Turkish women painters through a three-stage model (Berger, 2011; Burke, 2014):

• Pioneer/Generation (Late Ottoman): The first professional women to break social norms and enter the arts.

• Modernist/Generation (Early Republic): The generation strengthened by the Republic's modernization project and directly interacted with international movements.

• Contemporary/Generation (Post-1950): The generation that fully integrated universal trends such as abstractionism and conceptual art and emphasized personal expression.

This framework presents the history of Turkish women artists as a non-Western, alternative story of modernization and gaining artistic autonomy (Dastarlı & Cin, 2023; Parten, 2003).

*The "d Group" and After: Women Artists in Modernist Movements*Artists such as Eren Eyüboğlu and Fahrünnisa Zeyd, members of the "d Group," founded in the 1930s and a cornerstone of Turkish modernism, are viewed in a different context in the international community. These artists, far from being mere "firsts," have become prominent for their individual styles and avant-garde pursuits (Ergönül & Koca, 2017).

For example, in his article "Reconfiguring Modernism: Fahrünnisa Zeyd and the d Group in Istanbul," curator Ali Karpuz (2023) analyzes Zeyd's work within the context of "cosmopolitan modernism." According to Karpuz, Zeyd's unique style, which synthesizes elements of Byzantine mosaics, the Islamic miniature tradition, and Western modernism (especially Orphism and Abstract Expressionism), has positioned her in a unique position on the international modern art scene. This synthesis is seen by foreign critics as a successful example of "cultural hybridity" (Karpuz, 2023).

Thematic Trends: Form, Theme, and Gender

Several common themes emerge in the works of early women painters: individual quests for identity in portraiture and figurative works; modernist formal experiments (cubism, the transition to abstraction); and, at times, the dual representation of "female images"—internal, subjective representations versus externally viewed Ottoman/Turkmen "other" images. Furthermore, some studies discuss the importance of social stratification, emphasizing that women artists accessed art education through class/familial privilege (Köse & Şahan, 2021).

Ottoman modernization in the late nineteenth and early twentieth centuries, particularly with the opening of art schools in Istanbul, opened up opportunities for art education for women, albeit limited. In this context, the development of early women painters was influenced by educational institutions and state/elite networks (İnel, 2002). Ms. Mihri Müşfik (later Mihri Rasim) is one of the most prominent figures of this process. Mihri founded the İnas Sanayi-i Nefise School-for girls (Inas Sanayi-i Nefise Mektebi) in 1914, establishing the first art education institution that provided art education for women (Dağoğlu, 2019a). Both the art education Mihri received in Europe and the connections she established with the palace influenced both the formal and social context of her works (Dağoğlu, 2019b; Dağoğlu, 2019a).

Hale Asaf, an early modernist painter of the Republican era, brought modernist trends to Turkey through her work in Paris and Rome. These artists explored the tensions between identity, feminism, and modernity through portraiture, figurative works, and forms tending towards abstraction (İnel, 2002). Fahrelnissa Zeid is also frequently studied in international art literature as an artist who bridged Western modernism and Ottoman/Turkish aesthetic traditions, particularly through her large-scale abstract compositions. International art and academic circles tend to rediscover women painters through the lens of "invisible heroes" (İnel, 2002). This approach aims to remember and reintegrate women artists into art history by critiquing their historical oblivion. Furthermore, works are analyzed through formal, thematic, and gender lenses; for example, the works of Mihri and Zeid are reread within the frameworks of modernism, orientalism, and postcolonialism (Dağoğlu, 2019a). However, significant gaps remain in the literature: a lack of systematic review of archival sources, limited technical and pigment analyses, and a lack of analysis of women painters based on

social class or ethnicity. Qualitative/quantitative studies, feminist art historical methodologies, and global comparative analyses are recommended to fill these gaps (İnel, 2002; Dağoğlu, 2019b).

Conclusion

The challenging phases our women painters initially went through have been a challenging and encouraging process for their maturation and emergence as artists today. Our first women painters, by breaking a deeply ingrained tradition in society, making personal sacrifices, and quietly creating art from hidden corners, have made significant contributions to our women painters today. In addition to their personal art, our first women painters, who pioneered and trained in this field, laid the foundations of today's fine arts. From our perspective, we see that the artistic endeavors of women artists in the West are valued not according to gender discrimination, but rather according to the originality and quality of the product produced at the end of the creative phase, and the artist's strength.

The academic perspective of the international art community considers the first women painters in Turkish painting and their followers not as passive subjects, but as active "cultural producers" and "actors of modernity." These artists were both a consequence and a driving force of the social transformations of both the late Ottoman period and the early Republic. International literature interprets their works through the complex and rich dialogues they establish between East and West, traditional and modern, and the individual and collective, thus making Turkish art history an integral part of the global art historical narrative. This interest is increasingly fueled by international exhibitions and academic publications. The first women painters in Turkish painting are key players in the transformation of the country's art history, both in terms of artistic production and education and pedagogy. The art and academic community is increasingly reevaluating these figures; however, more in-depth archival, technical, and comparative studies are needed.

References

Akçay, S. (2015). Türk resim sanatında (1908-1930) Erken Cumhuriyet Dönemine kadar ilk ve öncü kadın ressamlar. Master Thesis, Doğuş Üniversitesi, İstanbul.

Berberoğlu, A. (2024). A Portrait of the Artist as a Young Woman: Müfide Kadri's Photograph. Keshif, 2(2), 10-19.

Berger, J. (2011). The success and failure of Picasso. Vintage.

Burke, P. (2014). The Italian renaissance: Culture and society in Italy. Princeton University Press.

Ciddi, M. (2025). Analysis of Attitudes of Undergraduate Art Students Toward Painting Workshop Lessons . International Journal on Social and Education Sciences, 7(2), 195-204. https://doi.org/10.46328/ijonses.764

Ceran, S. (2022). The Relationships between Secondary School Students' Visual Creativities in Art and their Attitudes towards Graphic Design. International Journal of Research in Education and Science, 8(3), 576-595. https://doi.org/10.46328/ijres.2962

Ceran, S. (2025). Examining High School Students' Artificial Intelligence Literacy in Visual Arts Subjects and Metaverse-Based Digital Art Attitudes. International Journal of Technology in Education, 8(4), 1245-1265. https://doi.org/10.46328/ijte.5360

Çakır, E., Öztürk, M., & Ünal, M. (2019). Interpainting as a Creating Method in Digital Illustration: Reinterpretations from Movie Scenes. Bilim, Eğitim, Sanat ve Teknoloji Dergisi (BEST Dergi), 3(2), 78-88. https://doi.org/10.46328/seat.v3i2.32

Çalıkoğlu, B. (2011). The transformation of women artists representation: a feminist analysis of the historical narrative and Istanbul Modern's new works new horizons exhibition (Doctoral dissertation).

Dağoğlu, Ö. G. (2019a). Mihri Rasim and the founding of the Women's Fine Arts Academy, İnas Sanayi-i Nefise Mektebi: A double-edged new social reality. Journal of the Ottoman and Turkish Studies Association, 6(2), 33–54. https://doi.org/10.2979/jottturstuass.6.2.05 ResearchGate+1

Dağoğlu, Ö. G. (2019b). Rasim, Mihri (1885–1954). In Routledge Encyclopedia of Modernism. https://www.rem.routledge.com/articles/rasim-mihri-1885-1954 DOI: 10.4324/9781135000356-REM2086-1

Dastarlı, E., & Cin, F. M. (2023). Feminist Art in Resistance: Aesthetics, Methods and Politics of Art in Turkey. Palgrave Macmillan.

Ergönül, E., & Koca, B. (2017). Erken Cumhuriyet Dönemi resimlerinde kadın imgesi: Modernleşme ve milliyetçilik. Art-e Sanat Dergisi, 10(20), 761-786.

Germaner, S., & İnankur, Z. (2002). Ottoman painting in the 19th century. İstanbul: Masa Yayınları.

Golonu, B. (2017). Modernizing nature/naturalizing modernization: late Ottoman and early Turkish republican landscape imagery, 1876-1939. University of Rochester.

İnel, B. (2002). Discovering the missing heroines: The role of women painters in early modernist art in Turkey. Middle Eastern Studies, 38(2), 205–212. https://doi.org/10.1080/714004451 tandfonline.com+1

İpek, S. (1996). Türk Resim Sanatında Gelişme Evreleri ve Kadın Ressamlarımız (Master's thesis, Anadolu University (Turkey).

Kancı, T. (2008). Imagining the Turkish men and women: Nationalism, modernism and militarism in primary school textbooks, 1928-2000 (Doctoral dissertation).

Karaoğlu, A., & Kara, S. (2014). Estetik Bir Obje Olarak Takı. İdil Sanat ve Dil Dergisi, 13, 69-79.

Karpuz, A. (2023). Reconfiguring modernism: Fahrünnisa Zeyd and the d Group in Istanbul. Journal of Modern Art History, 47(2), 145-162.

Kibici, V. B. (2022). The effect of project-based learning approach on lesson outcomes, attitudes and retention of learned in secondary school music. OPUS Journal of Society Research, 19(49), 771-783.

Kibici, V. (2025). Examining the Digital Literacy and Artificial Intelligence Attitudes of University Students Studying Arts. International Journal of Education in Mathematics, Science and Technology, 13(5), 1283-1297. https://doi.org/10.46328/ijemst.5839

Kolbay, S. D. (2024). A proposal in search of the form of the theory: Monument for Mihri Rasim. Yedi: Art, Design and Science Journal, 31, 59–73. https://doi.org/10.17484/yedi.1228097 DergiPark

Köse, Zühal & Şahan, Gülsün. (2021). A view of women in painting from the past to the present: the image of women in art and women painters: Geçmişten günümüze resim sanatında kadına bakış: Sanatta kadın imgesi ve kadın ressamlar. Journal of Human Sciences. 18. 431-449. 10.14687/jhs.v18i3.6151.

Oto, A. (2023). Cumhuriyet döneminde yetişmiş iki öncü sanatçı, Mihri Rasim ve Hale Asaf. Yedi, Özel Sayı, 43–52. https://doi.org/10.17484/yedi.1332730

Ozkan, Z. & Erdem, T. (2025). Examination of Expert Opinions on Art Skills Education for Individuals with Mild Intellectual Disabilities. International Journal on Studies in Education, 7(4), 1048-1068. https://doi.org/10.46328/ijonse.5766

Önen, Ü. L. (2021). Türk Resim Sanatı Tarihinde İlk ve Öncü Kadın Sanatçı Mihri Müşfik. Journal of Academic Social Science Studies, 14(84).

Özsezgin, K. (1976). Türk Plastik Sanatında Kadın Sanatçılarımız, Kültür ve Sanat Dergisi, S. 4.

Pelvanoğlu, B. (2013). Painting the Late ottoman woman. A Social History of Late Ottoman Women: New Perspectives, 54, 155.

Pelvanoğlu, B. (2017). Painting and women in late Ottoman times. In S. Germaner & Z. İnankur (Eds.), The Ottoman world: A cultural history reader (pp. 278-295). I.B. Tauris.

Parten, A. (2003). Çağdaş Türk sanatında kadın sanatçıların Etkisi (Master's thesis, Marmara Universitesi (Turkey)).

Pome, Y. (2017). On the Path toward Modernity: A Study of the Actors behind the Occidental Influences in Early Turkish Republican Painting (1923-1946). Kultur und kulturelles Erbe in der Türkei, 57, 1-30.

Shaw, W. M. K. (2011). Ottoman painting: Reflections of Western art from the Ottoman Empire to the Turkish Republic. I.B. Tauris.

Tekin, A. (2025). Examining High School Students' Attitudes towards Contemporary and Digital Art and Virtual Exhibitions. International Journal on Studies in Education, 7(4), 879-898. https://doi.org/10.46328/ijonse.5561

Toros, T. (1983). İlk Kadın Ressamlarımız 4, Sanat Dünyamız Dergisi, Yapı ve Kredi Bankası Kültür ve Sanat Hizmetleri, Sayı No: 28.

Toros, T. (1988). İlk Kadın Ressamlarımız, Akbank Kültür Yayınları, İstanbul.

Turgut, S. & Öztürk, M. S. (2025). Analysis of Posters Awarded in the Typography Category at Graphic Designers Professional Association Exhibitions. In M. S. Ozturk, O. Noroozi, & O. Bilen (Eds.), *Proceedings of ICSES 2025-- International Conference on Studies in Education and Social Sciences* (pp. 34- 42). ISTES.

Figures

Figures 1-2. Retrieved April 7, 2014, from http://ucelma.blogspot.com.tr/2010/12/tarihte-ilk-turk-kadn-ressammihri.html. 07.04.2014.

Figure 3. Mihri Rasim, Naile Hanım Portresi. Retrieved April 12, 2014, from http://ucelma.blogspot.com.tr/2010/12/tarihte-ilk-turk-kadn-ressammihri.html

Figures 4-6. Retrieved April 7, 2014, from http://ucelma.blogspot.com.tr/2010/12/tarihte-ilk-turk-kadn-ressammihri.html.

Figures 5-6-7-9: Toros, T. (1983). İlk Kadın Ressamlarımız 3. Sanat Dünyamız Dergisi, 9, 26-36

Author Information

Derya Özdemir Kibici

https://orcid.org/0000-0003-0471-7132

Hakkari University

Turkiye

Contact e-mail:

deryaozdemir@hakkari.edu.tr

Citation

Özdemir Kibici, D. (2025). The First Women Painters in Turkish Painting and Their Development. In M. Koc & O. T. Ozturk (Eds.), *Studies on Social and Education Sciences 2025* (pp. 122-142). ISTES.

Chapter 5 - Enhancing Research Methodology: The Role of Embedded Librarians in Supporting Academic Excellence

Shamsiah Abu Bakar

Chapter Highlights

- Universiti Malaya (UM), librarians play a pivotal role in supporting research methodology across various disciplines.
- Research Methodology is an integral part of academic training, aimed at equipping students and researchers with the necessary tools and skills to conduct high-quality research.
- They offer comprehensive guidance on research ethics, referencing, and information literacy, ensuring that students and researchers have access to essential resources and training.
- Additionally, academic librarians at UM are recognized as research partners, collaborating with faculty and students throughout the research process.
- They provide expertise in information discovery, literature management, research data management, and scholarly publishing.
- This partnership enhances the quality and efficiency of research endeavours within the university.
- Through these initiatives, UM librarians ensure that students and researchers are well equipped with the necessary skills and resources to conduct effective research, fostering a robust academic environment.

Introduction

The library was established on 15 December 1959 when the University of Malaya separated from the National University of Singapore. The entire collection was divided between the two institutions. The library has provided various services, and among the popular ones is by the User Education Services Division, which offers Information Skills Courses, Information Skills Sessions, and Research Methodology Sessions. The Research Methodology sessions are conducted upon invitation from faculties for librarians to embedded in the courses they offer.

Librarians play a pivotal role in supporting research methodology across various disciplines. Research Methodology is an integral part of academic training, aimed at equipping students and researchers with the necessary tools and skills to conduct high-quality research. They offer comprehensive guidance on research ethics, referencing, and information literacy, ensuring that students and researchers have access to essential resources and training. Additionally, academic librarians at UM are recognized as research partners, collaborating with faculty and students throughout the research process.

Course Contents

Online Public Access Catalog

The session began with an introduction to Pendeta OneSearch, the Online Public Access Catalogue (OPAC) that allows users to search for printed materials in the library.

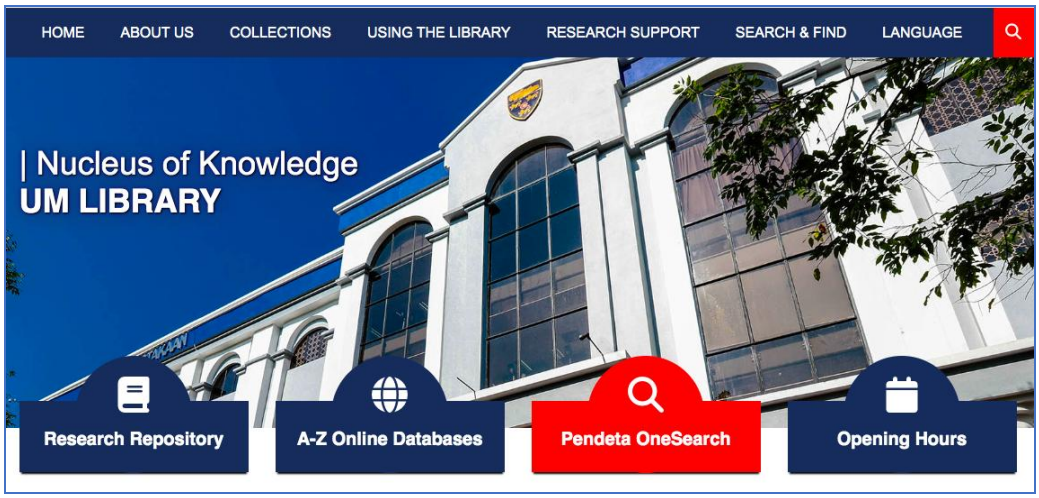


Figure 1. Pendeta OneSearch (Online Public Access Catalog)

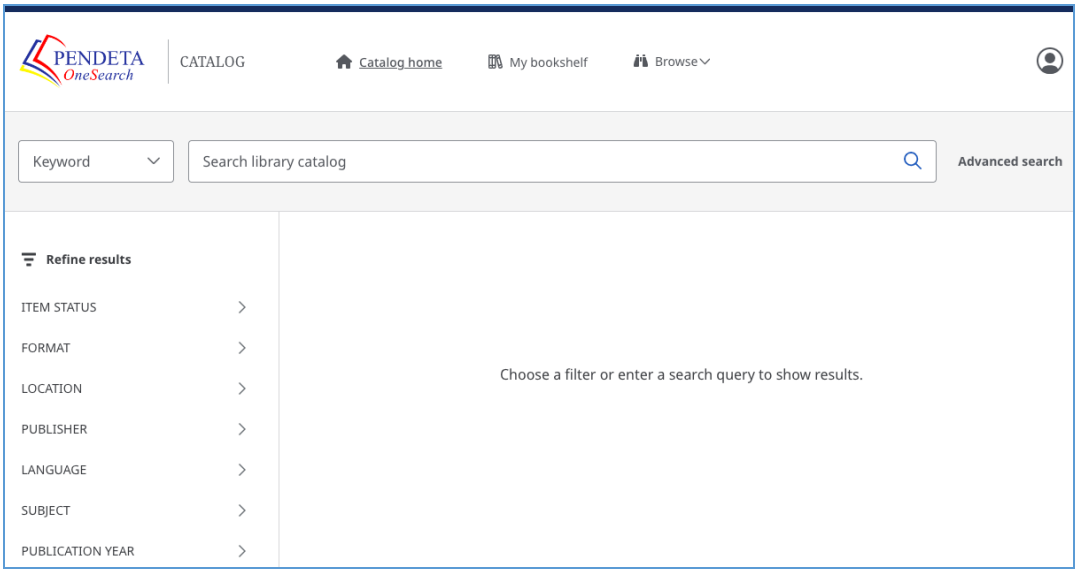


Figure 2. Pendeta OneSearch Interface Searching

The printed materials in this catalogue represent the entire University of Malaya Library collection, which comprises 14 libraries — including the Central Library, 3 branch libraries, and 10 faculties libraries.

Open Source Platforms

Participants were also introduced to open-source platforms through the PERPUN National Initiatives, which include Malaysian Theses Online (MyTO), Malaysian Academic Library Institutional Repository (MALRep), and the Malaysian Academic Library Union Catalog (MALCat).

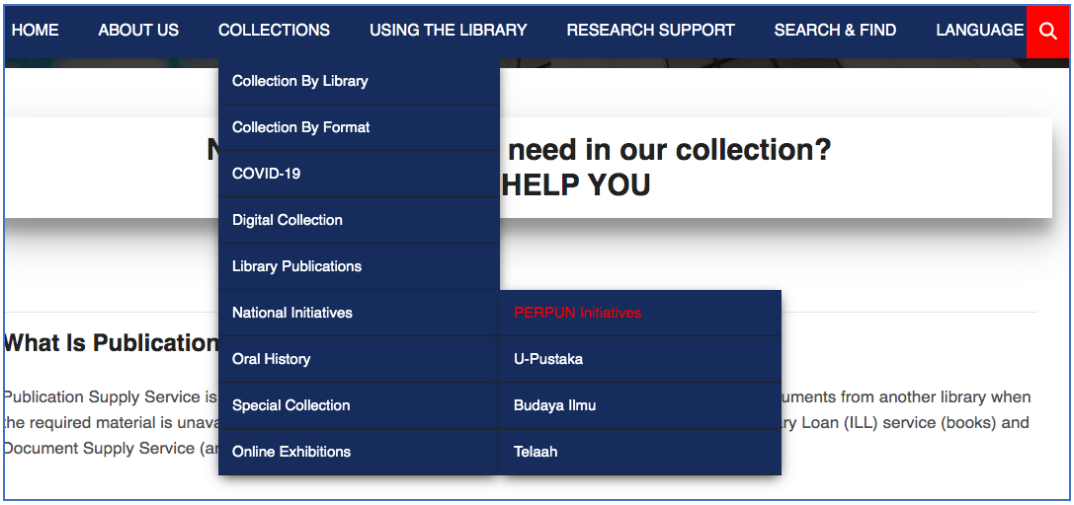


Figure 3. PERPUN (Nation Academic Universities Initiatives)

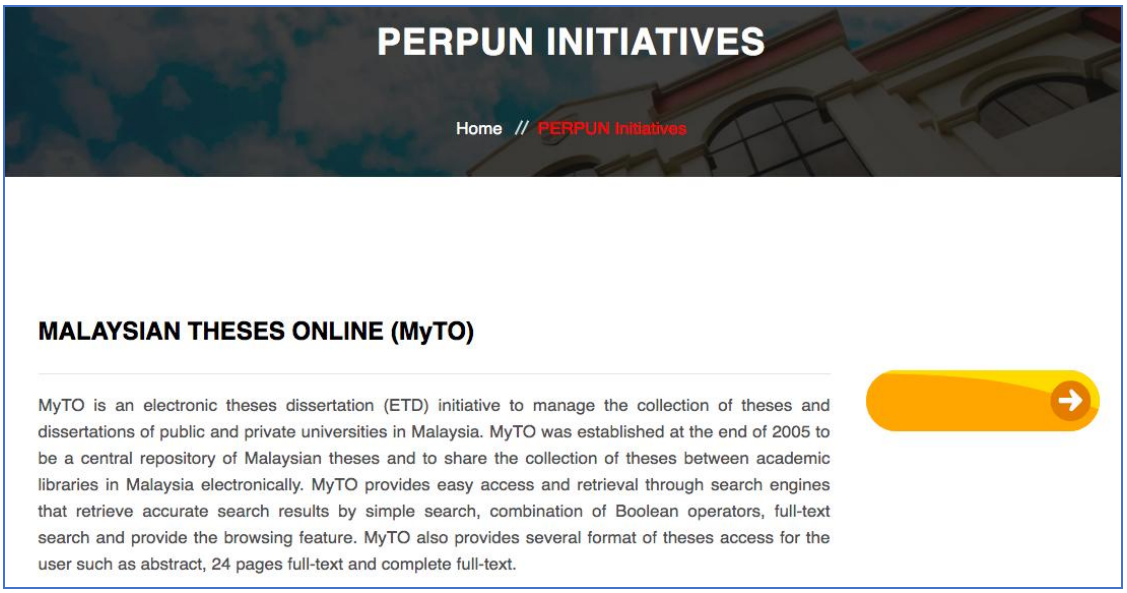


Figure 4. Malaysian Theses Online (MyTo)

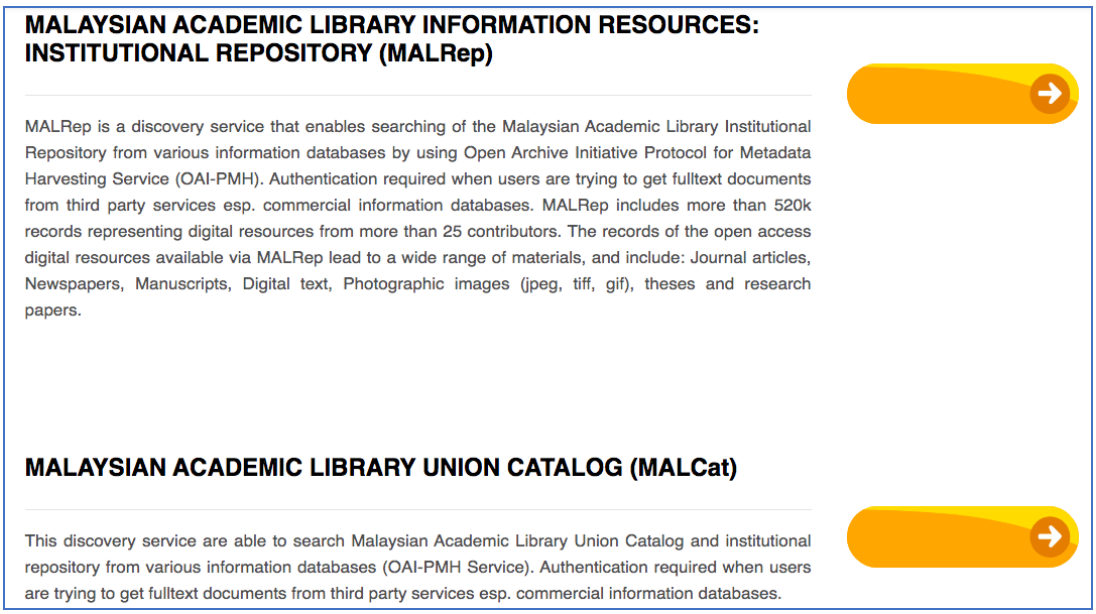


Figure 5. MALRep and MALCat

These platforms collectively serve as a comprehensive gateway to access theses, institutional repositories, and online public catalogues of academic libraries across Malaysia. This initiative is a strategic effort to meet national research needs. Consequently, researchers are not limited to the University of Malaya Library's collection alone — they can also refer to materials available at other institutions.

The session also covered Interlibrary Loan (ILL) and Document Delivery Services (DDS),

which help meet Malaysia's overall research needs. The Interlibrary Loan service allows users to borrow books available in other academic libraries, while the Document Delivery Service provides access to journal articles, book chapters, and conference papers. The University of Malaya Library offers this service *free of charge* for up to 10 articles for Master's students and 20 articles for PhD students. These materials are obtained not only from local university libraries but also from several international institutions, ensuring that students' research needs are fully met.

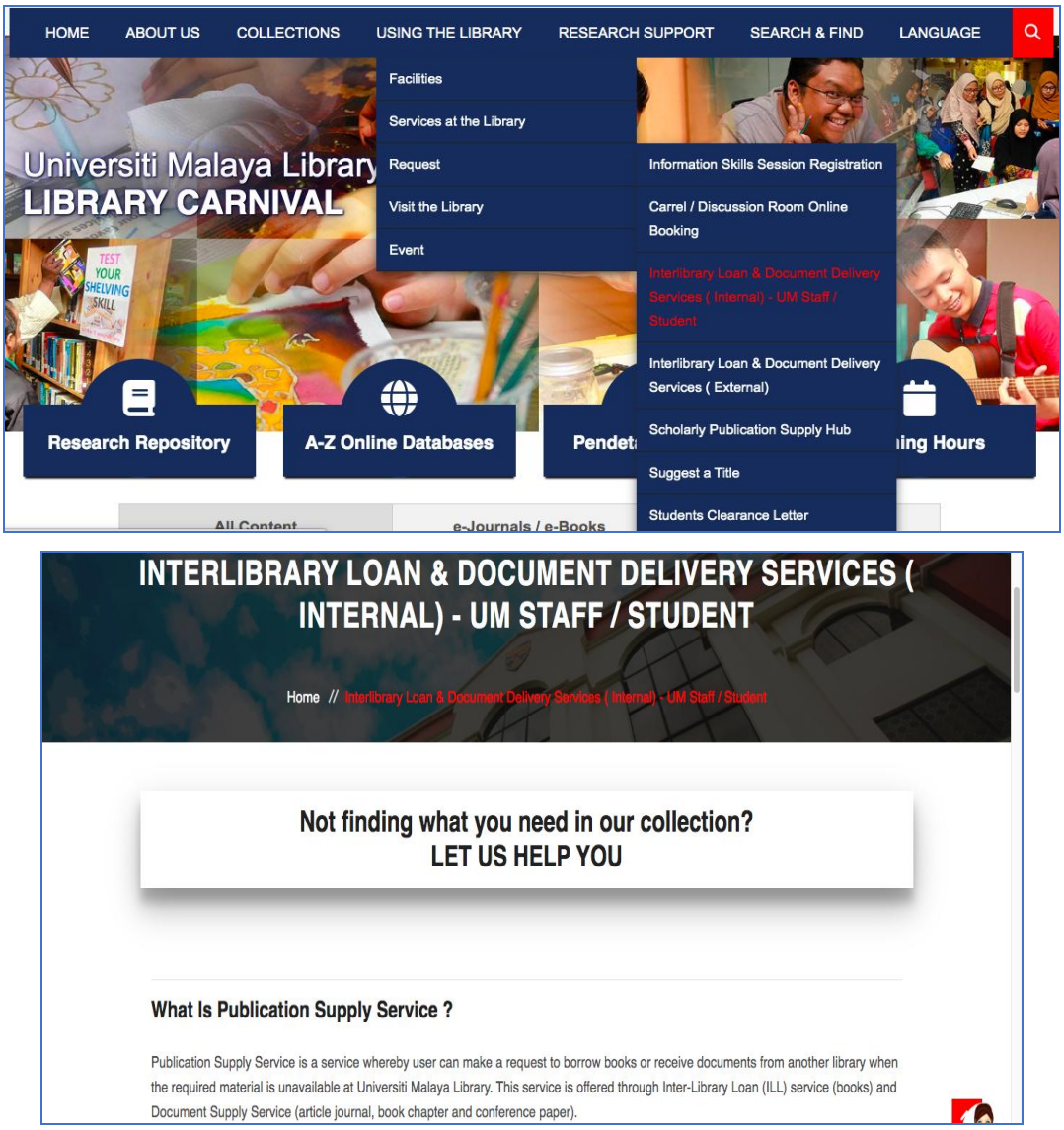


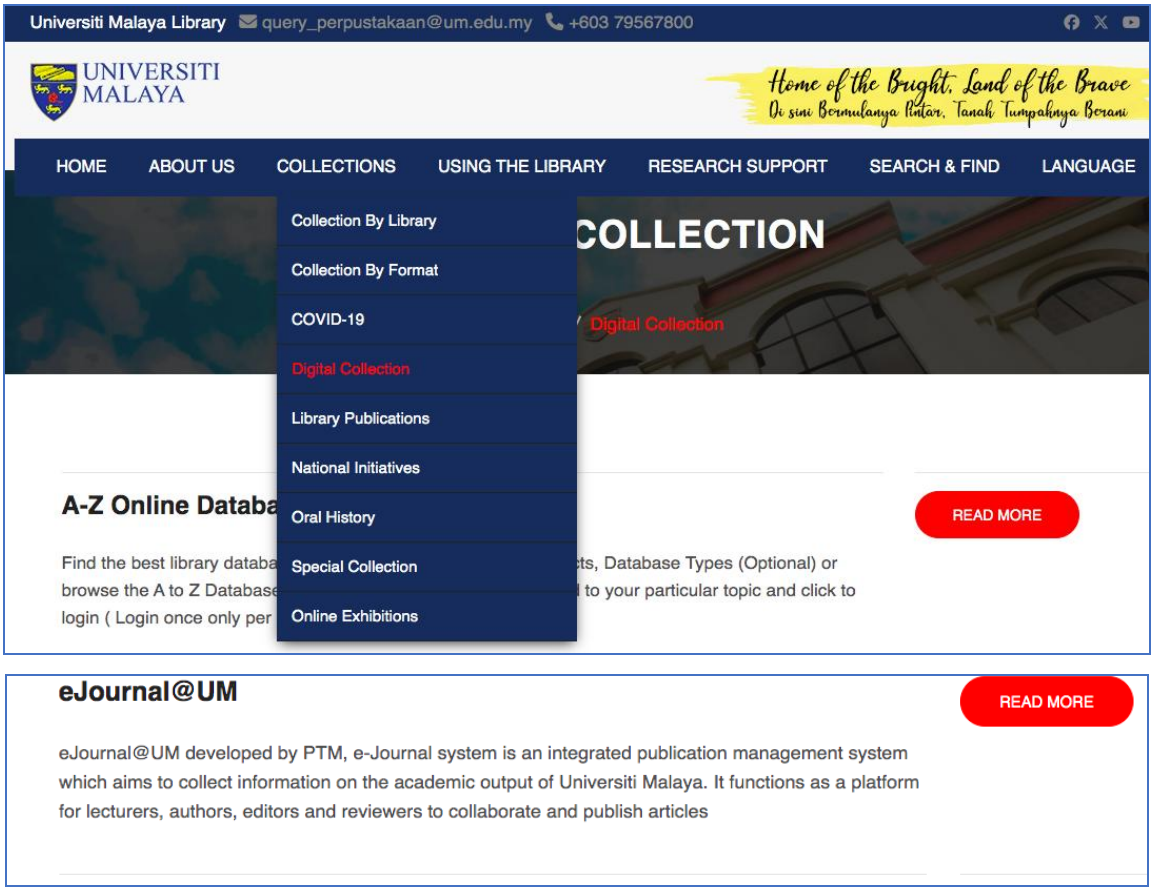
Figure 6. Interlibrary Loan (ILL) and Document Delivery Services (DDS)

In addition, students and researchers were introduced to other open-access resources, such as the Directory of Open Access Journals (DOAJ), Directory of Open Access Books (DOAB),

and Open Access Theses and Dissertations (OATD), all of which provide full-text access in PDF format.

Participants were also introduced to eJournal@UM, a platform showcasing University of Malaya's own academic publications, categorized by faculty and subject area. These journals are openly accessible, allowing students to view and download full-text articles online. Some of the titles published by UM include:

- *The Language and Literacy Education Journal (LALEj)*
- *The Malaysian Journal of Cybersecurity and Applications (MJCA)*
- *Journal of New Explorations in Electrical Engineering (NECE)*
- *The Malaysian Journal of Computer Science*
- *Journal of Surveying, Construction & Property (JSCP)*
- *The Asian Journal of Business and Accounting (AJBA)*
- *The Malaysian Journal of Library and Information Science*, among others.



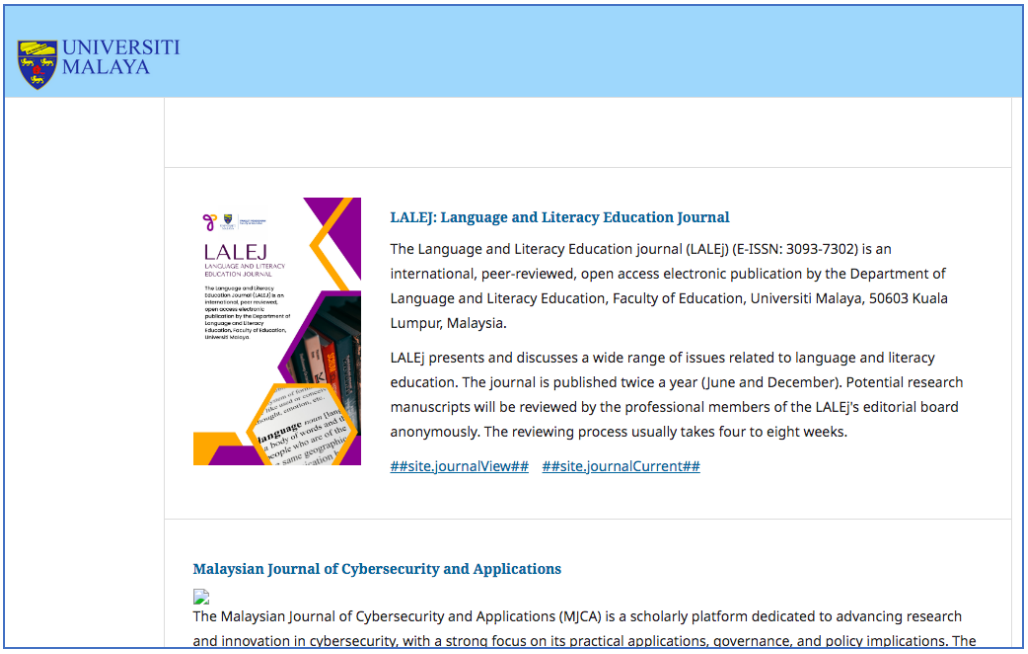


Figure 7. eJournal@UM

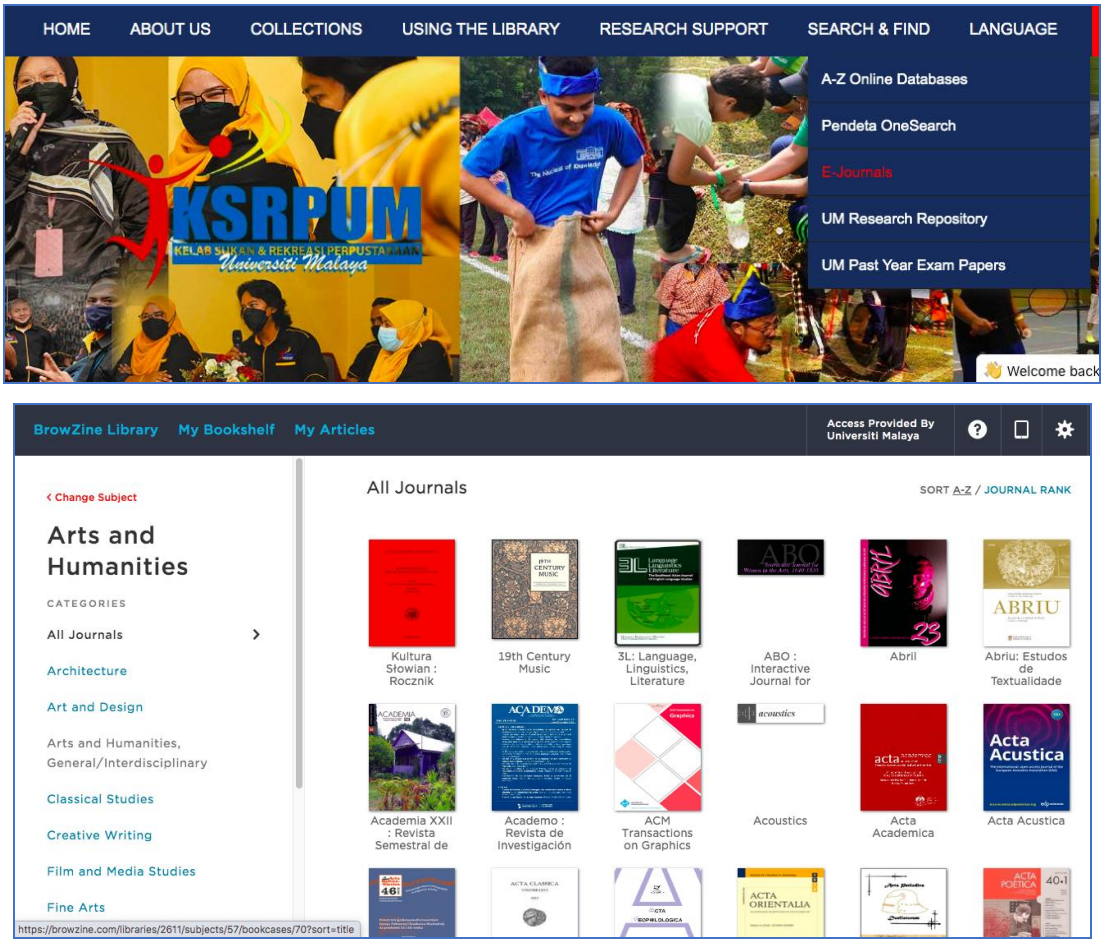


Figure 7. E-Journals (BrowZine platform)

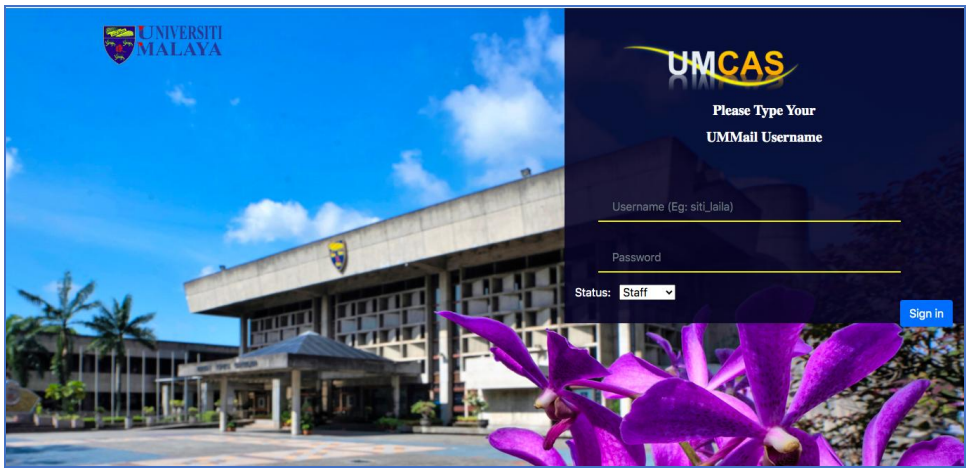
Finally, the BrowZine platform was introduced, which helps students identify journals relevant to their field of study based on the subscriptions available through the University of Malaya Library. All these journals are accessible in full-text PDF format, providing convenient access to high-quality academic sources.

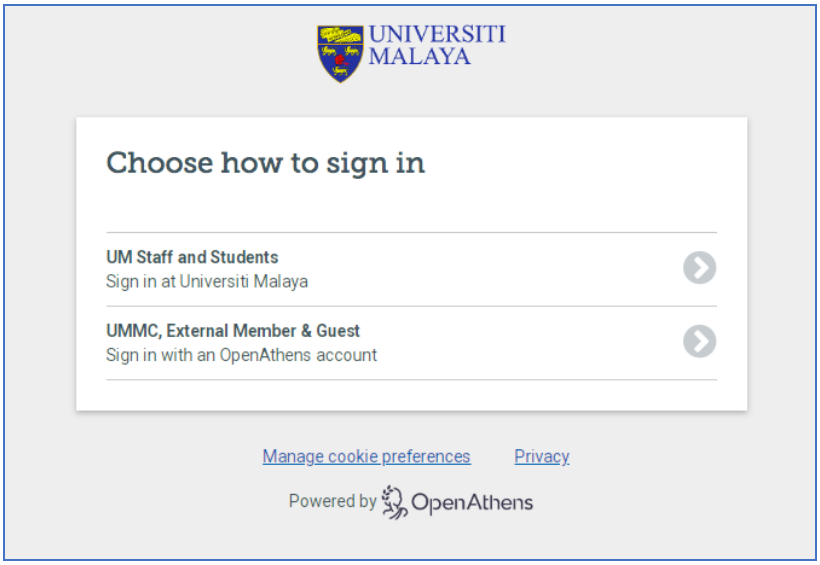
A-Z Online Databases (subscribed databases)

The next stage introduced students to the use of the A–Z Online Databases subscribed to by the University of Malaya Library. Students are required to access these databases through the library's official website at http://www.umlib.um.edu.my. Access to these databases is restricted to registered students and members of the University of Malaya Library. The Open Athens platform is used as the authentication system for accessing the University of Malaya Library's databases.

Currently, the library subscribes to 98 databases, including *EBSCOhost, EBSCO eBook, Project MUSE, ProQuest Dissertations and Theses Global, SAGE Research Methods, ScienceDirect, JSTOR Archive, EBSCO Discovery Service (EDS), Web of Science (WOS), SCOPUS, Association for Computing Machinery (ACM) Digital Library, Cambridge Journals Online, Emerald, Grove Music Online, IEEE Xplore, RIBA eBook*, and many others.

Although database access may vary depending on the students' academic discipline, the University of Malaya Library ensures that most of the databases subscribed to are multidisciplinary, allowing broader access to diverse research materials. Nevertheless, some databases remain subject-specific and cater to particular areas of study.





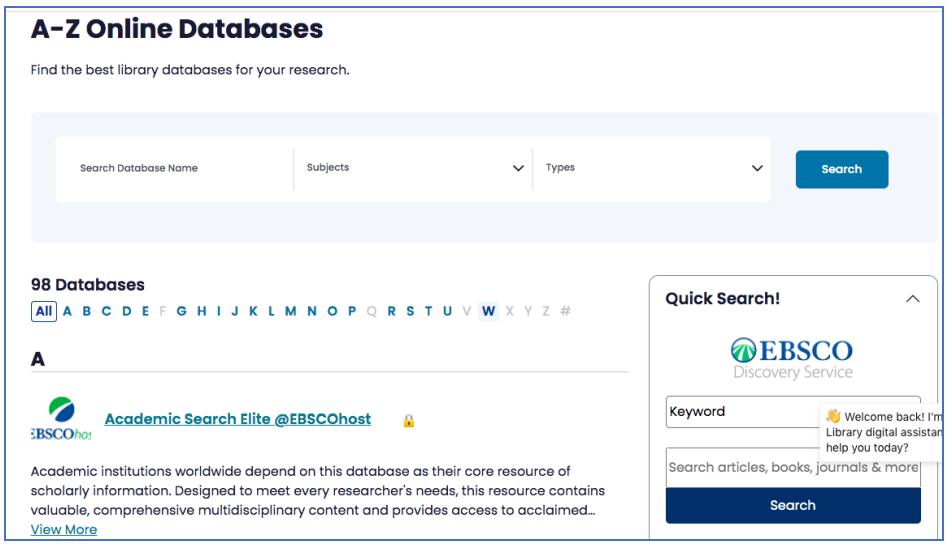


Figure 8. Open Athens and Access to A-Z Databases

Analytical analysis Databases (WOS and Scopus)

Students were also introduced to strategies for identifying high-quality journals and evaluating their ranking and citation performance. To this end, exposure to the Web of Science (WOS) database was emphasized as it provides powerful analytical tools that help students determine the best journals and most cited articles for reference or potential publication. Further guidance was provided on using Journal Citation Reports (JCR), Master Journal List, and h-index analysis to help students identify high-impact journals and quality references for producing strong theses and dissertations. In addition, the session highlighted

the importance of Scopus and SJR (SCImago Journal Rank) as essential platforms for identifying reputable journals and understanding publication impact. The SCImago platform was demonstrated to show how journal rankings and subject classifications can assist in selecting suitable journals for publication.

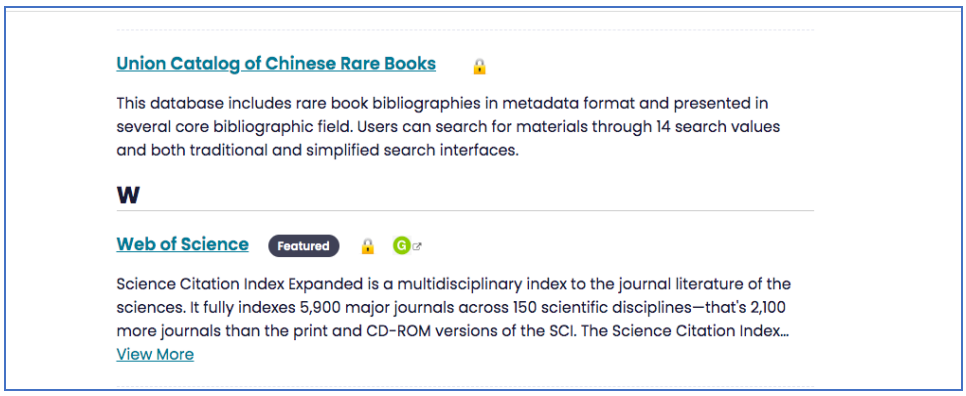


Figure 9. Web of Science (WOS)

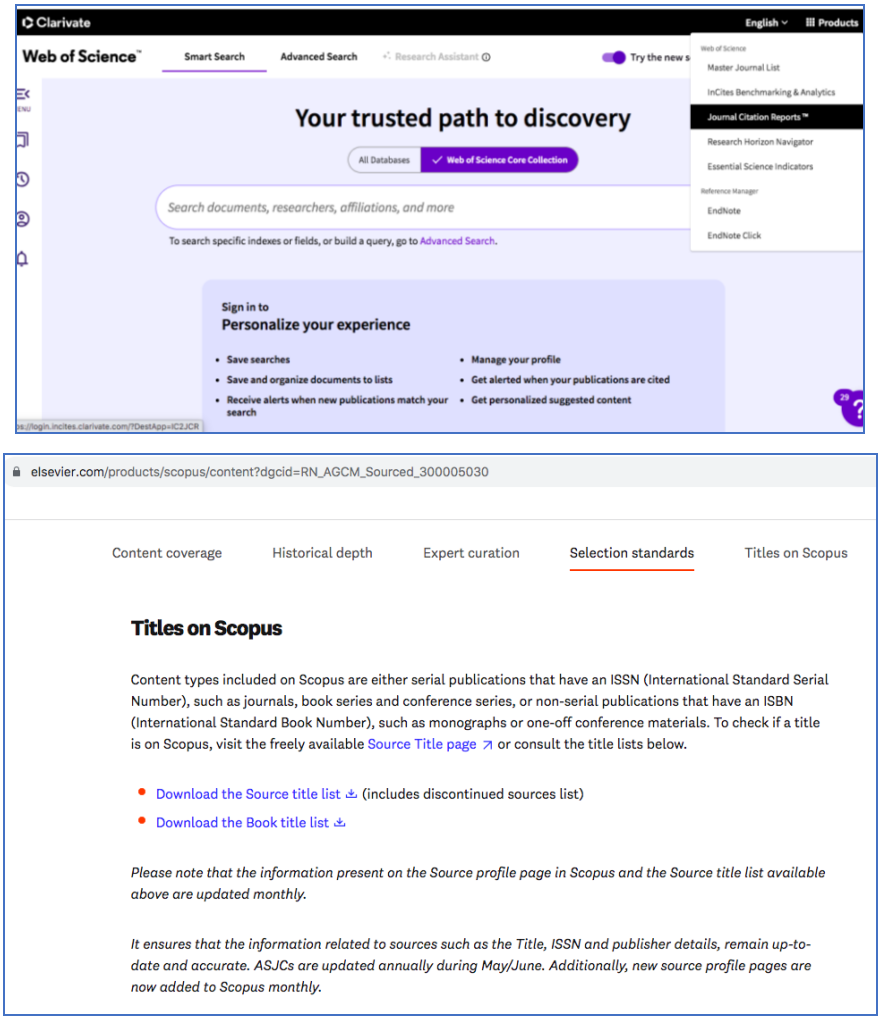


Figure 10. SCOPUS

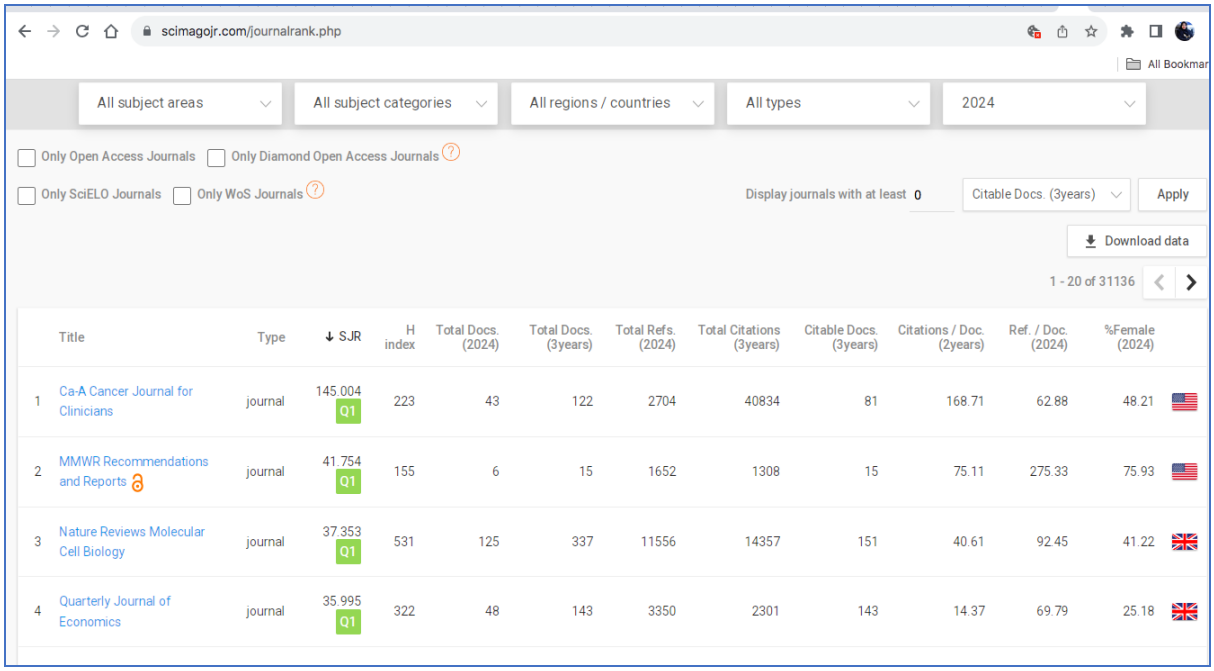


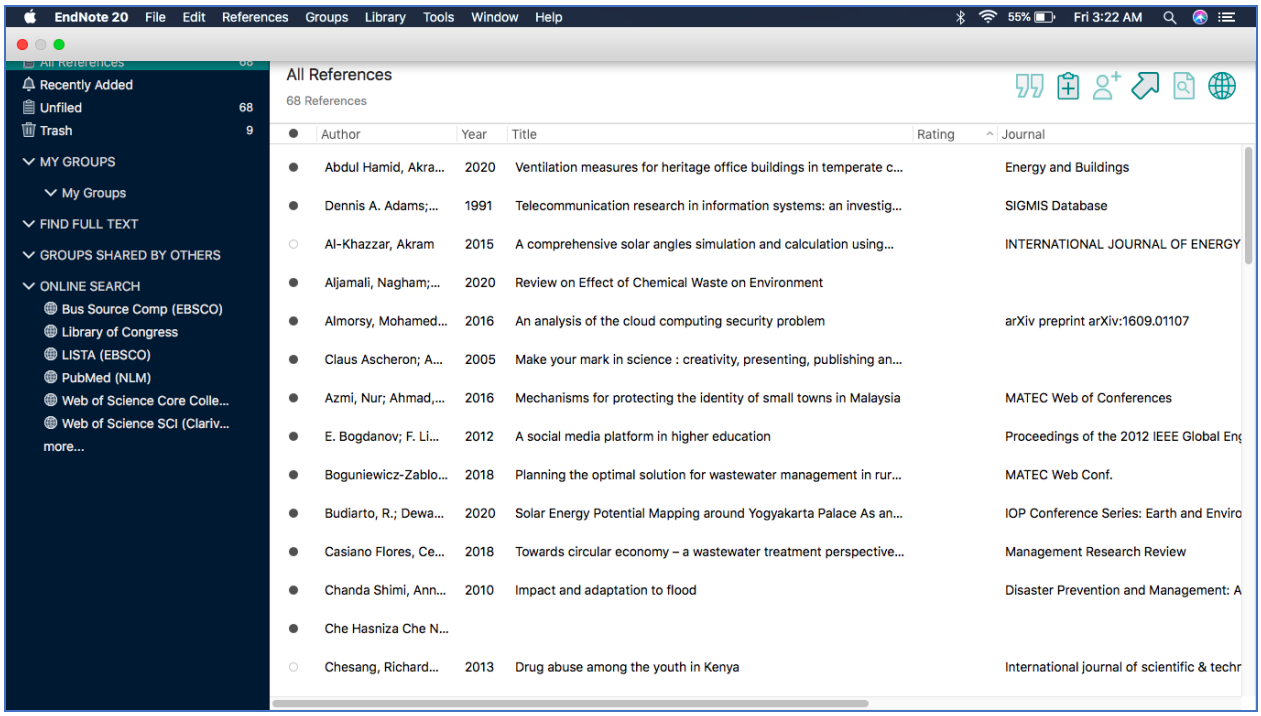
Figure 11. SJR (SCImago Journal Rank)

Data Management Software (EndNote software)

Students were also introduced to the EndNote reference management tool, which assists in generating accurate reference lists and bibliographies. The training covered five key functions:

- Manual input of references for various citation styles (APA, Numeric, MLA, etc.),
- Online Search using EndNote to obtain full-text articles
- Online Databases A-Z from subscribed databases
- Open Sources such as Google Scholar, and
- Exporting references via *Cite While You Write*, which enables users to automatically; generate in-text citations and bibliographies while writing.

Overall, the session lasted 3 to 4 hours and covered several major components — *Pendeta OneSearch, open-access resources, and the subscribed online databases* — providing students with comprehensive exposure to the key tools and platforms needed for effective academic research.



Data Analysis

Based on this session, a Google Form was created to evaluate the effectiveness of the session. Students were asked to complete the form to provide feedback for the purpose of continuous improvement.

Purpose

To evaluate the effectiveness and feasibility of the Research Methodology Session by the embedded Librarians in supporting academic excellence at Universiti Malaya Library. This includes testing the system, gathering user feedback, and identifying any potential issues that may arise.

Objectives

- To measure user satisfaction on Research Methdology Session
- To identify issues
- To evaluate the effectiveness of the resources and tools used

Methodology

- Quantitative

  Questionnaire (10 questions divided into 2 sections)

The questionnaire was divided into two sections:

- Section A focused on students' demographic information, such as name and matric number.
- Section B consisted of Information Skills Session Evaluation, which included 10 questions related to the content, delivery, and overall effectiveness of the session.
- Target respondents: Students of the Faculties. Evaluation form/Google form being distributed to respondents at the end of the session

Research Methodology Built Environment Faculty (BVX8001/BMX700)

Quantitative Results – ratings (1 = lowest, 5 = highest)

Question	N	Mean	Std Dev	Min	Max
How would you rate the overall content of the session?	14	**4.64**	0.51	4	5
How clear and understandable was the instructor's presentation?	14	**4.50**	0.65	3	5
Were the materials and resources provided helpful?	14	**4.57**	0.51	4	5
How relevant was the session to your academic or professional needs?	14	**4.71**	0.47	4	5

Interpretation:

All mean scores are above 4.5, indicating high satisfaction **and** positive participant perception**.** The content and relevance of the session were rated the highest (mean = 4.7). Instructor clarity received a slightly wider range of ratings, showing that while most found the presentation clear, a few participants suggested more examples or slower pacing.

Yes/No questions – key outcome percentages

Question	Yes (Count / Total)	% Yes
Did the session meet your expectations and learning goals?	14 / 14	**100%**
Did you feel confident in applying the information learned from this session?	14 / 14	**100%**
Would you recommend this session to others?	14 / 14	**100%**

Interpretation:

Responses **were** overwhelmingly positive — every participant confirmed the session met their learning goals, improved their confidence in applying research skills, and would recommend it to others. This demonstrates both content relevance and teaching effectiveness.

Qualitative findings – main themes from open-ended responses

- Appreciation / Positive feedback – Many comments expressed thanks and satisfaction with phrases like "Good session", "Very informative", and "Excellent presentation."
- Request for more hands-on or practical elements – Participants suggested including more applied demonstrations, such as case studies or exercises on data collection and analysis.
- Desire for real examples – Feedback mentioned wanting more real research examples or paper references to connect theory to practice.
- Suggestions for more time – Some participants recommended allocating more time for Q&A or discussion.
- No further suggestions – Several respondents simply wrote "None" or "All good," indicating satisfaction

Representative (anonymised) comment types observed:

- "Good and informative session."
- "Would like more examples or practical sessions."
- "Everything was clear and helpful."
- "No suggestions, thank you."

Key finding (Summary)

- High overall satisfaction.

Average ratings ≈ 4.6–4.7 across content, clarity, materials, and relevance.

- Excellent instructional delivery.

Participants praised the instructor's clarity, preparation, and engagement.

- Strong perceived learning impact.

100% of respondents felt confident to apply research methods learned.

- Unanimous recommendation rate.

All participants would recommend this session to others.

- Improvement area — hands-on practice.

The main suggestion was to include more applied or interactive activities, such as live demonstrations, examples, or group exercises.

Research Methodology Science Faculty (SMX7001)

Quantitative Results – ratings (1 = lowest, 5 = highest)

Question	N	Mean	Std Dev	Min	Max
How would you rate the overall content of the session?	55	**4.60**	0.62	3	5
How clear and understandable was the instructor's presentation?	55	**4.47**	0.68	2	5
Were the materials and resources provided helpful?	55	**4.56**	0.65	3	5
How relevant was the session to your academic or professional needs?	55	**4.56**	0.63	3	5

Interpretation: overall ratings are high (all means ≈4.5), indicating strong satisfaction. Instructor clarity is very good but shows the largest spread

Yes/No questions – key outcome percentages

Question	Yes (count / total)	% Yes
Did the session meet your expectations and learning goals?	54 / 55	**98.2%**
Did you feel confident in applying the information learned from this session?	55 / 55	**100.0%**
Would you recommend this session to others?	52 / 53	**98.1%**

Interpretation**:** overwhelmingly positive — virtually all respondents felt the session met expectations, felt confident to apply what they learned, and would recommend it.

Qualitative findings – main themes from open-ended responses

Top recurring themes / keywords (summary):

- Appreciation / thanks — many short positive notes (e.g., "Thanks" / "Good").
- Request for more practical/hands-on elements — several responses asked for physical, hands-on practice or worked examples ("Do it physically and hands on"; "Some examples could be added…").

- Desire for more examples and applied exercises — respondents want concrete examples, sample papers, or demonstrations showing how to perform methods.
- Suggestions about lecture style / pacing — a few comments implied the need for clearer examples or slower pacing for complex topics.
- No suggestions / none — several respondents indicated no further suggestions.

Representative (anonymised) comment types observed:

- Positive agreement (e.g., “Strongly agree”, “Agree”).
- Requests for hands-on practice / more examples.
- Short thanks / appreciation.

Key finding (Summary)

- High overall satisfaction. Mean ratings ~4.5 across content, clarity, materials, and relevance.
- Strong practical impact. **1**00% reported they felt confident to apply what they learned. This is a particularly strong outcome for a Research Methodology session.
- Very high recommendation rate. ~98% would recommend the session.
- Opportunity for improvement — examples & hands-on practice. The main area for improvement is adding more applied examples, demonstrations, and hands-on activities to help participants translate theory into practice. A small minority flagged instructor clarity/pacing issues.

Research Methodology Faculty of Sports and Exercise Science (VQX7001)

Quantitative Results – ratings (1 = lowest, 5 = highest)

Question	N	Mean	Std Dev	Min	Max
How would you rate the overall content of the session?	14	**4.57**	0.51	4	5
How clear and understandable was the instructor’s presentation?	14	**4.50**	0.65	3	5
Were the materials and resources provided helpful?	14	**4.64**	0.50	4	5
How relevant was the session to your academic or professional needs?	14	**4.71**	0.47	4	5

Interpretation:

All ratings are above **4.5**, reflecting a very positive perception. Participants found the content

clear, useful, and highly relevant to their studies. Instructor clarity had the widest spread (min = 3), suggesting a small minority preferred more examples or slower pacing.

Yes/No questions – key outcome percentages

Question	Yes (Count / Total)	% Yes
Did the session meet your expectations and learning goals?	14 / 14	**100%**
Did you feel confident in applying the information learned from this session?	14 / 14	**100%**
Would you recommend this session to others?	14 / 14	**100%**

Interpretation:

Every participant expressed satisfaction — all respondents felt the session met expectations, improved confidence, and would recommend it. This indicates excellent session effectiveness and strong teaching quality**.**

Qualitative findings – main themes from open-ended response

- Positive feedback and appreciation — many participants thanked the instructor and commented that the session was "good," "informative," or "helpful."
- Desire for more practical or hands-on examples — several suggested including live demonstrations or sample exercises to illustrate research applications.
- Request for more examples or real case studies — participants wanted to see how concepts are applied to real research scenarios.
- Need for more time or interactive discussion — a few respondents recommended allocating more time for Q&A or group sharing.
- No further suggestions — some simply responded "None" or "All good," showing overall satisfaction.

Representative (Anonymised) Comments:

- "Good session, informative and easy to understand."
- "Would like more examples for better understanding."
- "Everything was clear and helpful."
- "No suggestions, thank you."

Key finding (Summary)

- High overall satisfaction — average rating ≈ 4.6; strong satisfaction across all areas.
- Excellent instructor delivery — participants praised clarity, structure, and presentation quality.
- High learning impact — all participants felt confident applying what they learned.
- Unanimous recommendation rate — 100% would recommend the session.
- Improvement opportunity — introduce more applied, hands-on elements to complement the theoretical explanation.

Integrated Summary of Findings

Area	VQX7001	SMX7001	BVX8001/BMX7001	Overall Trend
Overall Satisfaction	Very high (mean ≈ 4.6)	Very high (≈ 4.5)	Very high (≈ 4.5)	All sessions rated highly
Instructor Clarity	High but some variation	Slight variation (few clarity comments)	Slight variation (min rating 2)	Excellent clarity with minor pacing issues
Content Relevance	Very relevant	Highly relevant	Highly relevant	Strong alignment with academic/professional needs
Learning Confidence	100% confident	100% confident	100% confident	Consistently strong learning confidence
Recommendation Rate	98–100%	98–100%	98%	Participants would all recommend sessions
Qualitative Feedback	Request for examples & slower pace	Request for more hands-on, real examples	Desire for practical elements & examples	Common theme: *want more applied/practical engagement*

Recommended Suggestions (Cross-Session)

Focus Area	Recommendation	Rationale
1.Pre-Session Preparation Materials	Provide pre-reads, slides, or sample papers 2–3 days before the session.	Helps participants come prepared and improves comprehension during delivery.

Focus Area	Recommendation	Rationale
2.Post-Session Learning Support	Share summary slides, templates, and short reflection questions. Consider follow-up Q&A or online discussion forum.	Reinforces knowledge retention and encourages continued engagement.
3.Interactive Facilitation	Include polls, breakout discussions, or Q&A rounds every 30–40 minutes.	Keeps sessions engaging and ensures clarity, especially for large or mixed-discipline groups.
4.Continuous Feedback Loop	After each series, circulate a short follow-up form to identify next-level topics (e.g., proposal writing, sampling, qualitative coding).	Builds responsive programming and aligns with users' evolving needs.

Conclusion

Across all three sessions — BVX8001/BMX7001, SMX7001 and VQX7001— participant feedback consistently reflects very high satisfaction, strong engagement, and practical value**.** All sessions successfully met learning expectations, strengthened participants' confidence, and provided relevant, meaningful content for research methodology learning. The Research Methodology training series demonstrates a solid foundation of excellence**,** with proven participant satisfaction and impact. Strengthening it through applied, interactive pedagogy will elevate it from a highly rated learning event to a flagship model of research literacy training at Universiti Malaya.

References

Association of Research Libraries. (2023). *Interlibrary loan and document delivery: Best practices*.

Clarivate Analytics. (2024). *Web of Science: Journal Citation Reports and Master Journal List*. https://clarivate.com/webofsciencegroup

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications.

Elsevier. (2024). *Scopus content coverage guide*. https://www.elsevier.com/solutions/scopus

Kumar, R. (2019). *Research methodology: A step-by-step guide for beginners* (5th ed.). SAGE Publications.

PERPUN National Library Consortium. (2023). *National open access initiatives: MyTO,*

MALRep, and MALCat.

SAGE Publications. (2024). *SAGE Research Methods database overview*. https://methods.sagepub.com

University Library System. (2024). *Online databases (A–Z databases) and discovery service*.

University Library System. (2024). *Information skills and research support services*.

Zikmund, W. G., Babin, B. J., Carr, J. C., & Griffin, M. (2013). *Business research methods* (9th ed.). Cengage Learning.

Author Information

Shamsiah Abu Bakar

https://orcid.org/0000-0001-7613-0344

Perpustakaan Universiti

Malaya

Contact e-mail: *sham@um.edu.my*

Citation

Abu Bakar, S. (2025). Enhancing Research Methodology: The Role of Embedded Librarians in Supporting Academic Excellence. In M. Koc & O. T. Ozturk (Eds.), *Studies on Social and Education Sciences 2025* (pp. 143-162). ISTES.

Chapter 6 - The Role of Interdisciplinary Approaches in Addressing Global Challenges

Aftab Afzal, Abid Ali Khan, Tariq Hussain, Mohamed Al Siyabi

Chapter Highlights

- *Rationale for Interdisciplinary Approaches:* Establishes why single-discipline strategies are insufficient for solving complex aviation and global challenges, emphasising integration to achieve holistic solutions.
- *Conceptual Framework:* The three-pillar model—Knowledge Integration, Methodological Blending, Collaborative Teams to operationalise interdisciplinary pedagogy.
- *Illustrative Student Projects:* Describes two flagship capstone projects at the Higher Education Institution (HEI) —an Avionics Fault Diagnosis System and a Life Support & Safety Evacuation Protocol, highlighting team composition, processes, and learning outcomes.
- *Measured Outcomes:* Presents quantitative metrics (25% growth in interdisciplinary capstone projects; 80% positive graduate feedback) and qualitative insights (employer testimonials on cross-functional skills) demonstrating program impact.
- *Challenges & Mitigation Strategies:* Identifies key obstacles—inconsistent terminology, scheduling conflicts, resource competition, and outlines solutions, such as glossary workshops and pooled resource scheduling tools.
- *Recommendations & Roadmap:* Provides actionable guidance for institutions aiming to adopt similar frameworks, including establishing interdisciplinary centres, incentivising co-teaching, forging external partnerships, and designing dual-discipline electives.

Introduction

Global challenges, ranging from climate change and pandemics to poverty and inequality, are inherently complex and transcend the boundaries of single academic disciplines. This abstract argues that effectively addressing these versatile issues necessitates a shift towards interdisciplinary approaches that integrate knowledge, methodologies, and perspectives from diverse fields. By encouraging collaboration among experts in natural sciences, social sciences, humanities, engineering, and other areas, interdisciplinary frameworks offer a more holistic understanding of the intricate dynamics underlying these challenges.

Traditional disciplinary expertise often provides valuable in-depth knowledge but can limit the scope of analysis and the development of comprehensive solutions. Interdisciplinary research, in contrast, encourages the synthesis of diverse insights, leading to innovative problem-solving strategies that consider the interconnectedness of various factors. Tackling climate change requires not only scientific understanding of atmospheric processes but also insights from economics, sociology, political science, and ethics to develop sustainable and equitable solutions. Similarly, managing global health crises demands collaboration between virologists, epidemiologists, social scientists, public health experts, and policymakers.

This submission will explore the benefits of interdisciplinary collaborations through illustrative examples of successful initiatives and research projects. It will highlight how integrating different perspectives can lead to a more comprehensive identification of root causes, the development of more effective and sustainable interventions, and a greater understanding of the societal and ethical implications of proposed solutions. Furthermore, it will discuss the challenges and opportunities associated with developing interdisciplinary research and education, emphasising the need for effective communication, shared methodologies, and institutional support to cultivate a culture of collaboration. Ultimately, this abstract suggests that embracing interdisciplinary approaches is crucial for navigating the complexities of global challenges and forging a path towards a more sustainable and equitable future.

In the conventional education system, every discipline at the tertiary level has its prerequisites (Khan, 2018). In the field of aviation, these challenges manifest in multiple

dimensions: reducing aircraft emissions, ensuring airport resilience against extreme weather, implementing effective health-screening protocols at airports, and designing inclusive passenger experiences (Rhoades et al., 2019). Historically, engineering education has been organized into discrete silos, emphasizing deep technical expertise within narrow domains (Society of Engineering Education, 2017). While specialisation is essential, this compartmentalisation often leads to fragmented problem-solving approaches, unable to address the interconnected nature of modern issues (Petrová & Esteban, 2018; Khan et al., 2024a).

Interdisciplinary education—defined as the integration of knowledge, methods, and perspectives from multiple disciplines to address complex problems—has emerged as a pedagogical imperative (Choi & Pak, 2006). In the context of aviation and aerospace engineering, integrating technical disciplines (e.g., avionics, mechanical systems) with social sciences and humanities can yield holistic insights into human behaviour, policy implications, and ethical considerations (Turner, 2020). For example, designing a fuel-efficient aircraft requires aerodynamic modelling, materials science, regulatory compliance, and an understanding of passenger expectations regarding comfort and sustainability.

Purpose

This chapter examines the role of interdisciplinary approaches in engineering education, with a specific focus on aviation-related domains. Drawing on the framework and empirical examples from a HEI in Oman, we:

Articulate the rationale for integrating multiple disciplines.

- Present a conceptual framework guiding interdisciplinary pedagogy.
- Describe two flagship student projects that exemplify interdisciplinary collaboration.
- Analyse outcomes—both quantitative and qualitative, demonstrating the benefits and challenges of this approach.
- Offer conclusions, recommendations, and a roadmap for other institutions seeking to implement similar models.

By synthesising theoretical foundations from the broader literature with concrete case studies at a HEI, this chapter contributes to understanding how interdisciplinary education can better prepare graduates to tackle the aviation industry's complex and evolving challenges.

Method

Theoretical Foundations for Interdisciplinary Education

The design of interdisciplinary programs was informed by a range of scholarships on interdisciplinary and transdisciplinary education.

Key principles include:

- Knowledge Integration: Combining domain-specific expertise (e.g., aerodynamic modelling) with broader contexts (e.g., human factors, policy analysis) to generate a comprehensive understanding.
- Methodological Blending: Merging quantitative methods (e.g., computational simulations) with qualitative techniques (e.g., stakeholder interviews, surveys) to validate technical solutions against real-world constraints. Digital literacy in the present day stands as an essential skill, allowing nations worldwide to equip their citizens for the complexities of the digital age; therefore, not only teaching technology but use of technology in program delivery plays a pivotal role (Khan et al., 2024b).
- Collaborative Team Structures: Encouraging co-supervision by faculty from different disciplines and forming student teams with diverse academic backgrounds to promote cross-pollination of ideas.

Development of the Conceptual Framework

Building on these foundations, a faculty at an HEI in Oman designed a three-pillar framework:

Pillar 1: Knowledge Integration

Curriculum Construction: Joint curriculum modules such as “Sustainable Aviation Technologies” were co-developed by faculty from avionics, mechanical engineering, life support systems, and defence studies.

Shared Reading Lists: Courses incorporated literature spanning technical research papers (e.g., on aerodynamic optimisation) and policy analyses (e.g., on aviation regulations and ethical AI). Students engaged with both peer-reviewed engineering journals and social science publications to broaden their perspective (Turner, 2020).

Pillar 2: Methodological Blending

Mixed-Methods Research: Capstone projects required teams to conduct computational simulations (e.g., aerodynamic CFD models) and complement them with field interviews (e.g., surveying airfield personnel on operational challenges). This validated technical performance metrics against user feedback, ensuring viability in real-world scenarios (Ghannam & Chan, 2021; Margolies et al., 2014).

Pillar 3: Collaborative Teams

Team Composition: Each student project team included a blend of technical (e.g., avionics, mechanical, life support) and non-technical (e.g., defence studies, humanities) students.

Co-Supervision: Dual faculty advisors, typically one from a technical discipline and one from a social science or humanities background, guided each team, providing nuanced mentorship on both engineering rigour and societal impacts.

Regular Seminars: Bi-weekly interdisciplinary seminars facilitated ideation, knowledge sharing, and peer feedback across projects.

A visual depiction of these pillars appears in Figure 1 below:

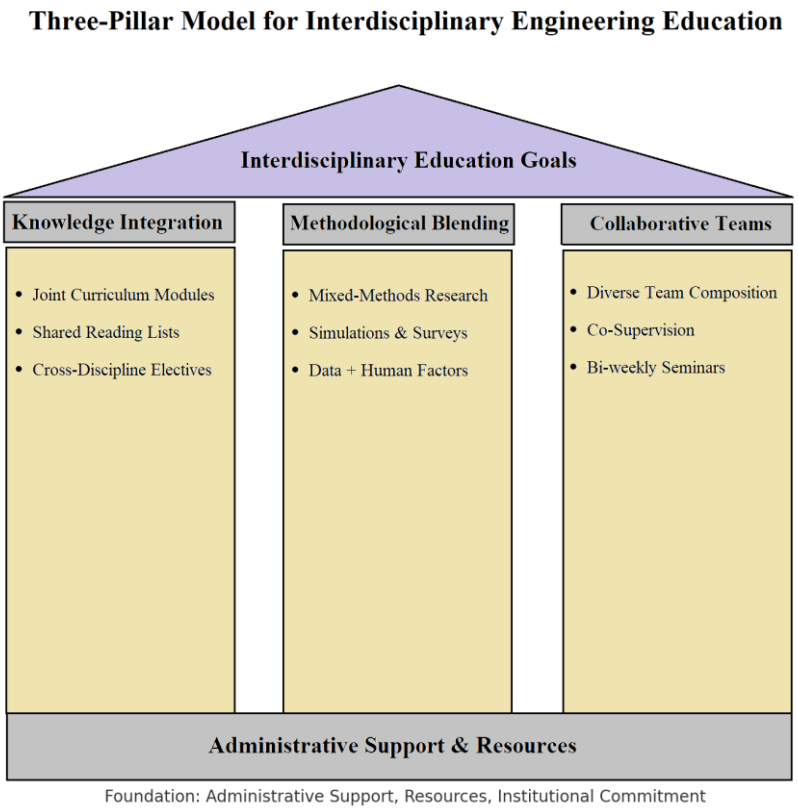


Figure 1. Pillars of the Interdisciplinary Framework

Development of the Conceptual Framework

To operationalize the framework, the following steps were taken during the 2024–2025 academic year at the HEI:

1. Curriculum Revision

Existing courses were audited to identify opportunities for integration (e.g., embedding ethics modules within engineering courses). New elective courses (e.g., "Aerospace AI Ethics") were proposed and approved for launch in 2025–26.

2. Faculty Development

Workshops on interdisciplinary teaching methods—covering techniques from project-based learning (Margolies et al., 2014) to mixed-methods research (Ghannam & Chan, 2021)—were conducted for participating faculty. A formal glossary workshop series addressed the "jargon gap" by aligning terminology across disciplines (Petrová & Esteban, 2018).

3. Student Team Formation

Students were grouped into five-member teams, balancing representation from avionics, mechanical, life support systems, and defence studies. Each team proposed capstone topics with an interdisciplinary scope, vetted by a selection committee.

4. Project Execution

Flagship projects: (a) Avionics Fault Diagnosis System and (b) Life Support & Safety Evacuation Protocol, were selected to pilot the new framework. Both projects spanned 12 months, culminating in demonstration events, technical reports, and conference-style presentations in May 2025.

5. Data Collection for Outcome Assessment

Quantitative Metrics: Number of interdisciplinary capstone projects, count of joint-authored publications, and graduate survey responses. Baseline data from 2023 were compared to 2024 outputs.

Qualitative Feedback: Post-project focus groups with students and interviews with industry stakeholders gathered insights on skill development, employability, and project relevance.

Results and Discussion

Project Case Study 1: Avionics Fault Diagnosis System

Team Composition and Roles

- Avionics Students (n=2): Designed and implemented onboard diagnostic algorithms for

sensor fault detection using Python and MATLAB's signal-processing toolboxes.

- Mechanical Students (n=2): Instrumented mechanical actuators with vibration and strain sensors, developing data acquisition protocols to capture real-time mechanical performance data.
- Defence Studies Student (n=1): Defined fault-tolerance requirements based on mission-critical combat scenarios, including latency constraints for failure detection in high-stress environments.

Interdisciplinary Process

1. Data Collection: Teams conducted actuator cycling tests in laboratory facilities. Mechanical sensors recorded vibration/strain data, while avionics algorithms processed sensor outputs in real time.
2. Algorithm Tuning: Avionics students iteratively refined fuzzy-logic and machine-learning classifiers to distinguish between normal wear and critical failures, using labelled datasets.
3. Mission-Scenario Testing: Under simulated combat mission loads, the system's detection latency and accuracy were validated. The defence student simulated communication constraints (e.g., limited bandwidth under electronic warfare) to assess algorithm robustness.

Learning Outcomes and Benefits

- Technical Integration: Avionics and mechanical students collaborated to align sensor bandwidth requirements with algorithm sampling rates, deepening mutual understanding of hardware–software interfaces.
- Defence Contextualization: The defence studies student translated technical performance metrics into mission-readiness assessments, enabling the team to prioritize features (e.g., fail-safe modes) based on operational risk (Turner, 2020).
- Enhanced Collaboration Skills: Through iterative team meetings and shared documentation, students learned to negotiate terminology and jointly troubleshoot integration challenges—a skill employers highly value (Ghannam & Chan, 2021; Petrová & Esteban, 2018).

Project Case Study 2: Life Support & Safety Evacuation Protocol

Team Composition and Roles

- Life Support Systems Students (n=2): Analyzed cabin pressure regulation and oxygen-supply dynamics during emergency descent scenarios using Simulink and computational fluid dynamics (CFD) models.
- Defence Studies Students (n=2): Developed tactical evacuation procedures under threat conditions, integrating considerations such as cabin depressurization, hijacking risks, and hostile-environment protocols.
- Avionics Student (n=1): Integrated emergency-alert mechanisms and oxygen-deployment interfaces into cockpit avionics, leveraging embedded systems design and human–machine interface (HMI) principles.

Interdisciplinary Process

1. Simulated Emergency Scenarios: Utilising a flight simulator, the team induced rapid cabin depressurization events. Life support students monitored pressure-regulation algorithms, while avionics students validated alert timing and oxygen valve activation sequences.
2. Evacuation Drills: Under defence-guided threat simulations, teams orchestrated passenger evacuation drills, adjusting tactical procedures to account for dynamic cabin conditions (e.g., low-visibility smoke, structural damage).
3. System Validation: Cockpit simulator exercises tested the interplay between life support algorithms (e.g., automatic oxygen mask deployment), avionics alert sequences, and defence-driven evacuation protocols, capturing human-factors data via video and biometric sensors.

Learning Outcomes and Benefits

- Application of Theoretical Knowledge: Life support students moved beyond textbook models to apply control-system design in dynamic, high-stress scenarios, gaining practical insight into equipment tolerances and human physiology (Turner, 2020).
- Contextual Awareness: Defence studies students recognized how technical system limitations (e.g., oxygen flow rate lag) impact tactical decision-making, informing more

realistic evacuation timelines (Petrová & Esteban, 2018).

- Holistic System Understanding: The avionics student deepened their appreciation of human factors, ensuring that alert protocols were timely and intelligible under emergency cognitive loads.

Quantitative Outcomes

The implementation of the approach resulted in the following successful outcomes:

- Implementing the stated approach at an Omani higher education institution (HEI), the number of interdisciplinary capstone projects increased by 25% between 2023 and 2024. The success of the approach was assessed through student feedback. The outcome of the feedback reflects that the approach expanded student interest and institutional support following framework implementation.
- Three joint-authored conference papers emerged from the two flagship projects, including publications in 2024-2025.
- In a graduate survey (n = 80), 80% of respondents reported improved critical thinking and adaptability, while 75% cited enhanced communication skills across disciplinary boundaries.
- Regional aerospace firms provided testimonials noting that graduates exhibited superior cross-functional competencies, particularly in systems integration roles.

Qualitative Feedback and Thematic Insights

Students emphasized that interdisciplinary projects forced them to "question assumptions", aligning with findings by Ghannam & Chan (2021) that project-based interdisciplinary learning broadens engineering problem-solving perspectives.

"Working on the Avionics Fault Diagnosis System taught me to consider not only algorithmic accuracy but also mechanical sensor limitations and operational context—something I never encountered in traditional coursework." —Final-year Avionics Student, HEI, Oman.

Initially, teams struggled with a "jargon gap" as avionics students used terminology (e.g., PWM, CAN bus) unfamiliar to defence studies peers, while defence students applied strategic

lexicon (e.g., Rules of Engagement, Threat Envelope) unfamiliar to technical peers. To address this:

Bi-Weekly Glossary Workshops: Students and faculty co-developed a shared online terminology library, updated iteratively throughout the semester (Nelson & Maru, 2015).
Plain-Language Briefings: Encouraged students to present technical results in "public-friendly" formats before formal technical presentations, improving clarity.

"The glossary workshop was essential; it levelled the playing field and prevented misunderstandings that could have derailed our project."
—Mechanical Engineering Student, HEI, Oman.

HEI's context in Oman required sensitivity to regional educational traditions (e.g., teacher-centered learning) and cultural norms (e.g., hierarchical communication) (Hitt et al., 2013). Mitigation strategies included:

Faculty Training on Cultural Adaptation: Workshops on pedagogical adaptations for Gulf-Arab contexts ensured that instructors recognized the importance of guiding students gently toward open discourse (Hitt et al., 2013).
Gradual Team Autonomy: Initial phases featured scaffolded team meetings with faculty mediators; over time, teams gained autonomy, reflecting a phased adoption of collaborative norms.

Challenges and Mitigation Strategies

Addressing the Jargon Gap

At the outset of the interdisciplinary initiative, students and faculty encountered significant barriers due to discipline-specific terminology. Avionics engineers, for example, employed technical jargon such as PWM and CAN bus, while humanities and defence-studies participants spoke of "rules of engagement" and "threat envelopes." To bridge this "jargon gap," the college instituted bi-weekly glossary workshops. During these sessions, participants collaboratively defined and documented key terms, which were then housed in a shared online terminology library. This strategy not only aligned everyone's vocabulary but also

fostered clearer communication and reduced misunderstandings throughout project development (Petrová & Esteban, 2018).

Resolving Scheduling Conflicts

Coordinating across multiple departments presented another hurdle: finding common meeting times within the existing timetable. Engineering courses typically run on different days than seminars in defence studies or life-support systems, making it difficult for interdisciplinary teams to convene. To alleviate this issue, the institution established a centralized scheduling committee tasked with harmonizing calendars. Furthermore, a reserved "interdisciplinary slot" was introduced every Wednesday afternoon, during which no department scheduled standalone classes. This block ensured that project teams could meet regularly without forcing participants to miss core courses.

Mitigating Resource Competition

With several teams relying on shared facilities, such as avionics testbeds and mechanical workshops, equipment usage quickly became overbooked, causing project delays. In response, the college implemented a pooled resource-booking system. This online tool allows teams to reserve lab time transparently and in advance. Additionally, quarterly "Resource Roundtable" meetings were convened, bringing together department heads to negotiate adjustments and prioritize access equitably. These measures minimized clashes over equipment and ensured smoother project progression (Petrová & Esteban, 2018).

Realigning Institutional Incentives

Finally, the institution's traditional promotion and tenure criteria posed a challenge: they heavily favored single-discipline publications, which inadvertently discouraged faculty from co-teaching or co-authoring interdisciplinary research. To counter this, the evaluation rubric was revised to explicitly recognise and reward collaborative activities (Pace & Ostendorf, 2022). Co-teaching credits were added to teaching portfolios, and a new seed-grant program funded joint courses and research development. By valuing interdisciplinary contributions alongside conventional scholarship, the college realigned incentives to support the very

collaboration it sought to foster (Petrová & Esteban, 2018).

Measuring Success: Metrics and Evidence

Quantitative Metrics

Between 2023 and 2024, the number of interdisciplinary capstone projects rose by 25 %, reflecting strong student uptake of the integrated curriculum. Over the same period, faculty and students collaborated to publish three joint-authored papers in reputable, peer-reviewed venues. Feedback from recent graduates further underscores the framework's effectiveness: 80 % of respondents reported significant gains in cross-functional skills, including enhanced critical thinking and communication.

Qualitative Metrics

Regional aerospace employers have praised HEI graduates for their exceptional ability to work across disciplines, with two leading firms explicitly noting marked improvements in teamwork and system-level problem solving. Within the college, faculty focus groups revealed that instructors observed higher levels of student engagement and richer classroom discussions—students routinely drew connections across technical, ethical, and human-factors perspectives.

Taken together, these quantitative and qualitative indicators demonstrate that the interdisciplinary framework not only elevates student learning outcomes but also fosters meaningful idea exchange and builds institutional momentum for deeper integration across departments.

Conclusion

Interdisciplinary education is no longer an optional pedagogical approach but a critical imperative for preparing engineers to navigate 21st-century challenges, particularly in sectors like aviation where technical, social, ethical, and policy dimensions converge (Petrová & Esteban, 2018; Turner, 2020). The case of the HEI in Oman illustrates how an intentional, structured framework—grounded in knowledge integration, methodological blending, and collaborative teams—can transform student learning and yield measurable outcomes.

Through capstone projects such as the Avionics Fault Diagnosis System and Life Support & Safety Evacuation Protocol, students developed not only technical acumen but also essential skills in communication, adaptability, and critical thinking, aligning with broader calls for engineers who can think holistically.

However, the transition to an interdisciplinary model is not without challenges. Terminology misalignment, scheduling conflicts, technology, resource competition, and entrenched faculty incentives can impede progress (Çakır et al., 2019; Petrová & Esteban, 2018; Tekin, 2025; Turgut & Ozturk, 2025). Yet, HEI's proactive mitigation strategies, glossary workshops, centralized scheduling, pooled resource tools, and revised evaluation rubrics provide a replicable roadmap for other institutions.

In conclusion, embedding interdisciplinary approaches into engineering curricula demands careful planning, institutional support, and continuous assessment. When executed effectively, it generates graduates equipped to design fuel-efficient aircraft, devise resilient airport infrastructures, and develop autonomous UAV systems that are ethically sound and socially responsible (Turner, 2020). As the aviation industry faces evolving global challenges—from climate change to geopolitical tension educational institutions must encourage cross-disciplinary collaboration to drive innovation and societal impact (Honey, Pearson & Schweingruber, 2014).

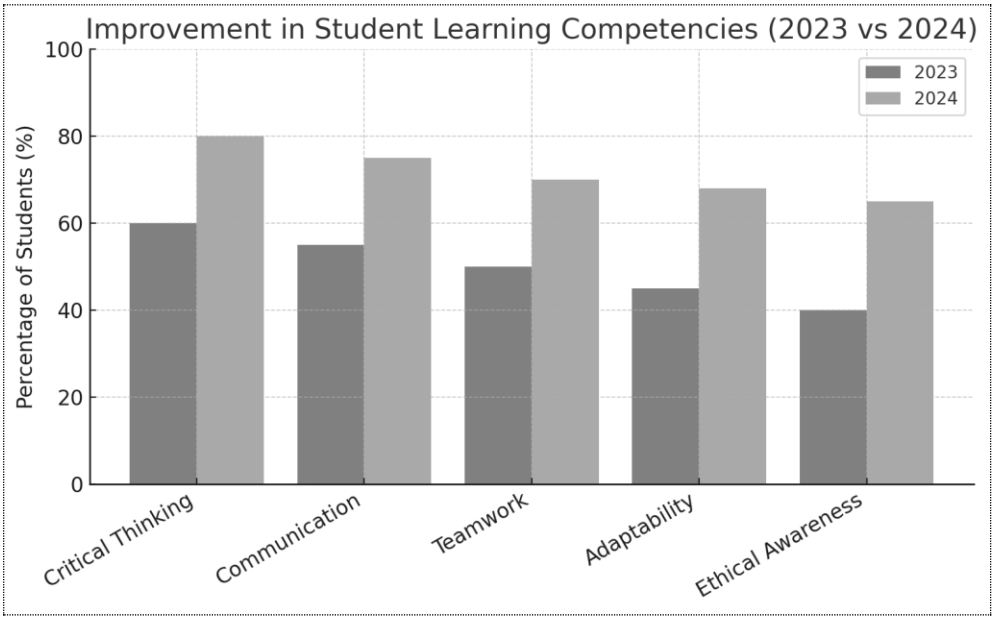


Figure 2. Reflection of Improved Student Competencies

The data shown in Figure 2 clearly illustrate marked gains across all key competencies—critical thinking, communication, teamwork, adaptability, and ethical awareness—strongly supporting our "Results" section's assertion that the interdisciplinary approach delivers significantly enhanced learning outcomes.

Recommendations

Based on HEI's experience and the broader literature, the following recommendations are offered for institutions seeking to implement or enhance interdisciplinary engineering education:

1. Establish an Interdisciplinary Centre

Create a dedicated physical space (interdisciplinary labs, shared offices) and administrative unit to coordinate cross-departmental activities, mirroring HEI's Interdisciplinary Centre model (Petrová & Esteban, 2018; Khan et. al., 2021).

2. Revising Faculty Incentives and Evaluation Criteria

Adjust promotion and tenure guidelines to value co-teaching, collaborative research, and interdisciplinary publications (Petrová & Esteban, 2018). Offer seed grants for faculty to develop joint courses and research projects.

3. Develop a Shared Terminology Platform

Institutionalise regular glossary or "jargon alignment" workshops at the semester outset. Host a dynamic online repository where students and faculty can consult and update interdisciplinary terminology (Petrová & Esteban, 2018).

4. Implement Centralised Scheduling and Resource Allocation Tools

Form a scheduling committee to coordinate timetables across departments. Use shared calendars or custom software to manage lab bookings, ensuring equitable access.

5. Design Joint Curriculum Modules

Pilot elective courses co-taught by instructors from different disciplines (e.g., "Aerospace AI Ethics," "Sustainable Aviation Policy") to encourage early exposure to interdisciplinary

thinking (Turner, 2020).

6. Promote External Partnerships

Negotiate Memoranda of Understanding (MoUs) with government agencies (e.g., Oman Civil Aviation Authority) and industry sponsors to provide real-world problem statements, internships, and funding (Pace & Ostendorf, 2022).

7. Integrate Mixed-Methods Research Training

Offer workshops on combining quantitative simulations (e.g., CFD, data analytics) with qualitative techniques (e.g., stakeholder interviews, surveys) to validate technical solutions.

8. Conduct Continuous Assessment

Employ both quantitative (project counts, publication metrics, graduate surveys) and qualitative (focus groups, employer interviews) methods to iteratively refine the interdisciplinary program.

9. Promote Cultural Adaptation

In contexts where traditional pedagogies are deeply entrenched (e.g., Gulf-Arab institutions), provide faculty development on culturally sensitive interdisciplinary teaching practices (Hitt et al., 2013).

By following these recommendations, institutions can more effectively prepare engineers who not only possess deep technical expertise but also the broader contextual awareness, ethical sensibilities, and collaborative skills necessary to address the multifaceted challenges facing the aviation sector and beyond.

References

Choi, B. C. K., & Pak, A. W. P. (2006). Multidisciplinarity, interdisciplinarity and transdisciplinarity in health research, services, education and policy: 1. Definitions, objectives, and evidence of effectiveness. *Clinical and Investigative Medicine, 29*(6), 351–364.

Çakır, E., Öztürk, M., & Ünal, M. (2019). Interpainting as a creating method in digital

illustration: Reinterpretations from movie scenes. *Bilim, Eğitim, Sanat ve Teknoloji Dergisi (BEST Dergi), 3*(2), 78–88. https://doi.org/10.46328/seat.v3i2.32

Ghannam, R., & Chan, C. (2021). Teaching undergraduate students to think like real-world systems engineers: A technology-based hybrid learning approach. *(Yayın bilgisi eksik – dergi/konferans adı eklenmelidir).*

Hitt, G. W., Isakovic, A. F., Fawwaz, O., Bawa'aneh, M. S., El-Kork, N., Makkiyil, S., & Qattan, I. A. (2013). Secondary implementation of interactive engagement teaching techniques: Choices and challenges in a Gulf Arab context. *(Yayın bilgisi eksik – dergi/konferans adı eklenmelidir).*

Honey, M., Pearson, G., & Schweingruber, H. (Eds.). (2014). *STEM integration in K–12 education: Status, prospects, and an agenda for research*. National Academies Press.

Khan, A. A. (2018). Role of pre-university education in laying the foundation for engineering competencies development. In K. S. Al-Jabri & T. Pervez (Eds.), *Proceedings of the 28th Arab Engineering Education Conference* (pp. xx–xx). Muscat, Oman. *(Sayfa numarası eklenmelidir).*

Khan, A. A., Hussain, T., Ashraf, A. M., Al Siyabi, M., & Al Shibli, A. (2021). Redefined norms in education and their impact on engineering competencies. In S. Jackowicz & M. Al Jabari (Eds.), *Proceedings of ICSEST 2021: International Conference on Studies in Engineering, Science, and Technology* (pp. 13–22). ISTES Organization.

Khan, A. A., Hussain, T., Al Siyabi, M., Al Shibli, A., & Afzal, A. (2024a). Futuristic digital technologies and engineering competencies. In A. A. Khan & O. T. Ozturk (Eds.), *Studies on social and education sciences 2024* (pp. 150–171). ISTES.

Khan, A. A., Hussain, T., Al Siyabi, M., Al Shibli, A., Hussain, S., & Pillai, J. R. (2024b). Challenges and prospects of cutting-edge technology in education. In M. S. Ozturk & M. Koc (Eds.), *Studies on education, science, and technology 2024* (pp. 104–121). ISTES.

Lattuca, L. R., Knight, D. B., & Bergom, I. (2017). Developing a measure of interdisciplinarity. *Innovative Higher Education, 41*(5), 405–421. https://doi.org/10.1007/s10755-016-9375-3

Margolies, R., et al. (2014). Project-based learning within a large-scale interdisciplinary research effort. *Journal of Engineering Education, 103*(2), 264–289. https://doi.org/10.1002/jee.20051

National Academy of Engineering. (2005). *Educating the engineer of 2020: Adapting*

engineering education to the new century. National Academies Press.

Nelson, R. E., & Maru, R. S. (2015). Cultural impacts on collaborative learning in the Gulf region. *International Journal of Educational Development, 41*, 101–108. https://doi.org/10.1016/j.ijedudev.2015.01.006

Pace, L., & Ostendorf, R. (2022). Industry–academic partnerships for interdisciplinary engineering education. *Journal of Engineering Education, 111*(3), 429–447. https://doi.org/10.1002/jee.20482

Petrová, G., & Esteban, J. (2018). *Challenges of interdisciplinary engineering education: A case study*. University of Twente.

Rhoades, A., Turner, J., & Singh, R. (2019). Airport resilience to extreme weather events: A systems approach. *Journal of Air Transport Management, 75*, 50–60.

Society of Engineering Education. (2017). *Shaping the future of engineering education: Phase II report*. Shaping the Future Commission.

Tekin, A. (2025). Examining high school students' attitudes towards contemporary and digital art and virtual exhibitions. *International Journal on Studies in Education, 7*(4), 879–898. https://doi.org/10.46328/ijonse.5561

Turgut, S. & Öztürk, M. S. (2025). Analysis of Posters Awarded in the Typography Category at Graphic Designers Professional Association Exhibitions. In M. S. Ozturk, O. Noroozi, & O. Bilen (Eds.), *Proceedings of ICSES 2025-- International Conference on Studies in Education and Social Sciences* (pp. 34- 42). ISTES.

Turner, D. (2020). Integrating engineering and humanities: Preparing students for complex global challenges. *Studies in Higher Education, 45*(10), 2150–2164. https://doi.org/10.1080/03075079.2019.1622519

Author Information

Aftab Afzal
https://orcid.org/0009-0002-4650-723X
Military Technological College
Al Matar Street, Muscat
Oman
Contact e-mail: *aftab.afzal@mtc.edu.com*

Abid Ali Khan
https://orcid.org/0000-0001-7763-1490
Military Technological College
Al Matar Street, Muscat
Oman

Tariq Hussain
https://orcid.org/0000-0001-9975-8986
Military Technological College
Al Matar Street, Muscat
Oman

Mohamed Al Siyabi
https://orcid.org/0000-0003-4898-9234
Military Technological College
Al Matar Street, Muscat
Oman

Citation

Afzal, A., Khan, A. A., Hussain, T., & Al Siyabi, M. (2025). The Role of Interdisciplinary Approaches in Addressing Global Challenges. In M. Koc & O. T. Ozturk (Eds.), *Studies on Social and Education Sciences 2025* (pp. 163-180). ISTES.

Chapter 7 - The Uses of Artificial Intelligence to Improve Scientific Research to Confront the Problem of Extremism (A Field Study on Egypt)

Prof Dr. Elsayed Salama Elkhamisy, Maryam Shawky Tera

Chapter Highlights

- Identify the conceptual framework for improving scientific research outcomes using artificial intelligence.
- Identifying the philosophical and intellectual frameworks that can be relied upon in confronting extremism and terrorism.
- Exploring the most important applications used to improve scientific research outcomes and confront extremism using artificial intelligence.
- Developing a proposed vision for using artificial intelligence in scientific research to confront the problem of extremism in Egypt.

Introduction

The global community is currently witnessing major changes and transformations in various fields and areas of knowledge, such as: rapid scientific and technological progress, great progress in means of transportation and communication, the information revolution, and the related necessity of establishing a knowledge society and building the information society, and the prevailing globalization in the fields: political, Economic, social, and cultural, which had profound repercussions on the political, economic, social, and cultural systems, which imposed interactions and blocs on the world that did not exist before (Faraj, 2021: 214).

Information institutions also witnessed the launch of the Fourth Industrial Revolution, which is based on innovative artificial intelligence technologies and applications, as it is characterized by a radical difference compared to previous technologies, whether in the depth of its impact, or the degree of entangled, And their connection to various fields, Thus, they represent knowledge- and technology-based technologies, and their models include: robotics, NATO technology, quantum computing, biotechnology, the Internet of Things, big data, augmented reality, three-dimensional printing, autonomous vehicles, and others (Ahmed & Salem, 2022: 27).

Given the the university is the one that has the ability to change students by modifying extremist ideologies, it is the one that gives learners behaviors that limit extremism and reevaluates them to be normal members of society. As a result of the impact of the Fourth Industrial Revolution on various areas of life, which brought about qualitative shifts in all fields, and now has an impact on the individual and society,

It has become necessary to develop scientific research in higher education, where scientific research is an effective tool in solving societal problems, and also a tool that helps to understand the root causes of extremism, as the combination of scientific research and artificial intelligence helps to monitor and track behavioral changes that appear in students. Cyberattacks containing threats or identity attacks, or extremist discourse analysis, can also be tracked, and scientific research can be activated to develop plans and treatment programs to counter and reduce extremism.

The Study Problem

Terrorist organizations in many places all over the world consider school environments as attractive recruitment places. The Home Affairs Committee, refers to three platforms where extremist groups recruit their members: prisons, the internet and the school environment. Over the past two decades, enrollment rates in schools have increased across the developing world. or example, indicated that university campuses in Iraq became central locations for radicalization and recruitment by violent groups. The Islamic groups used their provision of social services to recruit new members. Especially for young individuals, membership in these radical groups provided them new social statuses with more authority and responsibility and at the same time, the opportunities of housing, employment, marriage and religious education, In Mauritania, recruitment of radicalized youths sometimes occurs in madrasas (Islamic schools) or religious seminaries. In these educational systems, a space for interaction between youth who are prone to violent ideas and those who are not is created. This contrast often leads to more receptiveness of madrasa graduates for ideas of violent extremism(Sas,et al, 2020:4).

A study (Mohammadi, 2021) has shown that preventing radicalization is one of the most controversial issues in the world in this century. In addition, some extremist groups have been found to be recruiting into educational circles. These findings have led to a new approach for the education sector as a prominent partner in preventing and combating youth radicalization. Education faces many challenges in developing countries. As the worldview, cultures and beliefs of human beings have changed, the goals of education have also changed and accordingly, there is a direct relationship and coordination between society and education. The inefficiency of the education system in different parts of society will have negative effects and serious consequences, as evidenced by the results, and the lack of inclusive education, lack of quality education and lack of post-graduate employment opportunities are recommended to strengthen the role of ESD in developing countries. This process can be one of the most important and influential institutions, investing in equal education, creating a safe environment for students at different levels (primary, secondary and higher) and adopting sensible strategies. Integration, rapprochement, peaceful coexistence and the elimination of violence among peoples and nations have brought about many.

As (Christodoulou, 2020)noted ,Despite the Radicalisation Awareness Network (RAN) being tasked with being a core policy tool of the European Union and helping to shape its research funding agenda on preventing violent extremism, very little is known about how it operates, the practices and activities it engages with and the discourses it mobilizes to do so. This study fills this gap through an in-depth investigation into RAN's working group on education, critically examining the construction and enactment of discourses and practices related to the prevention of violent extremism through education. Combining a critical engagement of organizational practices with a discourse analysis of the various RAN EDU outputs, such as manifestos, policy papers and videos, it offers an examination of the discursive terrain of the European Commission, revealing the normative values and ideological assumptions underpinning it, as well as the subject-positioning of students and teachers involved.

A study (Ahmad, Malik & Batool, 2018) focused on find out the causes of terrorism through the perceptions of university students enrolled in teacher training institutions. This study was quantitative in nature. A sample of two hundred and sixty seven students was selected from public sector teacher training institutions. A self-developed and validated instrument was used to identify students' perceptions about the causes of terrorism which consisted of thirty two statements. Responses were obtained on five point Likert type scale. Mean, Standard deviation, independent sample t-test, and One Way ANOVA were applied to analyze the data. The major findings of the study indicated that students perceived poverty, foreign interference, wrong interpretation of Islamic preaching, and social injustice as the main causes of terrorism. It is also found that most of the participants think that drone attacks on the border areas of neighboring country, from the air basis provided to foreign army, are the major causes of terrorists' activities. On the basis of these findings it is recommended that, as education is a key medium to create awareness about the causes of terrorism. There is an urgent need to educate the people and specially youngsters to play their role in establishing peace in the region.

The major findings of the study(Ahmad, Malik & Batool, 2018) indicated that students perceived poverty, foreign interference, wrong interpretation of Islamic preaching, and social injustice as the main causes of terrorism. It is also found that most of the participants think that drone attacks on the border areas of neighboring country, from the air basis provided to foreign army, are the major causes of terrorists' activities. On the basis of these findings it is

recommended that, as education is a key medium to create awareness about the causes of terrorism. There is an urgent need to educate the people and specially youngsters to play their role in establishing peace in the region.

Egypt has lived waves of terrorism, and after the fall of the regime of President Hosni Mubarak Egypt faced a wave of extremism and terrorism is not the first wave experienced by Egypt in its history, we have known in the era of King Farouk when the assassination of Khazindar Pasha, then assassinated Nafrashi Pasha, and the rule of Cairo Salim Zaki, and several assassinations and acts of violence, and the destruction of cinemas and facilities Haret al-Jews, and the Eastern advertising company and others, and was the first defendant in it, and it is now certain that he was the actor, is the organization of the Brotherhood, and then in In the eighties and nineties, we also knew another wave of terrorism, and the escalation of terrorism, which increased by 80% in 2014 compared to 2013, doubled its economic repercussions, which amounted to about $ 52.9 billion in 2014, an increase of 61% over the previous year. (al namnam ,2016: 17).

The loss of the public treasury reached $ 45 billion during the nineties and beyond 2000, and the total cost of terrorism borne by the state and tourism companies exceeded $ 200 billion. Terrorism also leads to an increase in public spending, an impact on the public budget deficit and an increase in public debt due to the cost of confronting terrorism, and the research estimated the losses in domestic output from 2011 to 2015 at about 385 billion pounds and affected economic growth rates (Al-Habbal, 2023).

It wasn't the easiest choice to use military force to confront the recent wave of extremism in the country. Rather, it was the most difficult option that exhausted the country’s strength economically, militarily, and socially. Therefore, education is the best way to confront extremism and terrorism, but scientific research in higher education in Egypt is still weak, as he lacks the use of artificial intelligence, which weakens his ability to solve the problem of extremism.

The study (Longo, 2019, October) stressed that artificial intelligence scientists should work to provide researchers with less technical knowledge with richer explanations and qualitative descriptions of their own methods, and on the other hand, researchers who mainly adopt

qualitative research methods should expand their technical knowledge, and devote efforts to learning those formal concepts and methods provided by artificial intelligence.

The study (Humans: 2020) also indicated that the challenges facing the application of artificial intelligence in teaching, the most important of which are: the lack of readiness of the hardware and software in universities necessary to apply artificial intelligence in the teaching process, the lack of experience among faculty members in the field of artificial intelligence applications in teaching, the weakness of the infrastructure of universities, and the high financial costs of applying artificial intelligence.

As the study (Subroto & Selamat, 2014) explains: that the functions of search engines to detect plagiarism can be improved by adding computing machine learning into it, and it has been proven through the results of this study that the use of machine learning has a high average accuracy.)Hinogo, 2019) conducted a study aimed at: Analysis of practical results on artificial intelligence in higher education indexed in the web databases of science and Scopus during the period from 2007 to 2017, and the study used the descriptive survey method, and the results showed that there is a global interest in the subject of artificial intelligence in the literature on this topic at an early stage, although artificial intelligence is a reality, but the scientific output about its application in higher education has not been standardized.

Therefore, the researchers conducted an exploratory study on a sample of (200) individual researchers in the field of educational sciences and humanities.

Table 1. The reality of Respondents' Use of Artificial Intelligence Tools in Scientific Research to Confront Extremism

Variables	Always	Sometimes	Scarcely	Arithmetic mean	Relative weight
To what extent do you use artificial intelligence tools in scientific research?	10%	58%	32%	1,52	50,7%
To what extent do you use artificial intelligence tools to reformulate your scientific research?	4%	15%	81%	1,23	41%

Variables	Always	Sometimes	Scarcely	Arithmetic mean	Relative weight
How well do you know about artificial intelligence tools used to combat extremism and violence?	4,5%	7%	88,5%	1,16	38,7%
To what extent are you able to use artificial intelligence tools in the field of scientific research?	6%	15,5%	78,5%	1,28	42,5%
To what extent is artificial intelligence applied in the field of teaching scientific research curricula at your university?	5%	15%	80%	1,25	41,7%
To what extent is the university able to use artificial intelligence applications to identify students at risk of radicalization?	6%	25,5%	68,5%	1,38	45,8%

The exploratory study showed that the study sample agreed that there are many obstacles in the use of artificial intelligence in the field of scientific research, which are due to the lack of awareness of artificial intelligence tools used in the field of scientific research, and the lack of use of artificial intelligence in the field of teaching scientific research methods in universities. There is also a lack of awareness of the uses of artificial intelligence in the field of higher education to confront extremism and violence, and the weak ability to integrate artificial intelligence applications in higher education to reduce extremism.

From the above, the current study will answer the following questions:

RQ1: What is the conceptual framework for improving scientific research outputs using artificial intelligence?

RQ2: What are the philosophical and intellectual frameworks that can be relied upon in confronting extremism and terrorism?

RQ3: What is the proposed vision for the use of artificial intelligence in scientific

research to confront the problem of extremism?

Objectives of the Study

The present study sought to achieve the following objectives:

- Identify the conceptual framework for improving scientific research outputs using artificial intelligence.
- Identify the philosophical and intellectual frameworks that can be relied upon in the face of extremism and terrorism.
- Explore the most important applications used to improve scientific research outputs and counter extremism using artificial intelligence.
- Develop a proposed vision for the use of artificial intelligence in scientific research to confront the problem of extremism.

Methodology

To answer the problem of research and familiarity with the aspects of the topic, the descriptive approach was used to present and discuss concepts, and to present some applications that illustrate the role of artificial intelligence in improving scientific research and confronting extremism.

Theoretical Framework

Artificial intelligence, which means the ability of machines to learn, deduce, and provide choices based on that, is not far from entering the field of education, as teachers may use it to make lessons compatible with the personality of each individual student, as educational software that works with artificial intelligence can store data about the student's mental abilities, And the speed of his response, and his scientific, personal and cultural preferences, which enables the machine to present the lesson and take exams according to these capabilities, and this indicates that this technology will never replace the human element, as it will be devoted to teaching students theoretical lessons, while the teacher will have more time to communicate with his students. (Bakari, 2022, p. 292).

The Difference between Automation and Artificial Intelligence (AL)

Before starting to clarify the impact of artificial intelligence on the field of education, it is necessary to distinguish between two basic terms, namely (Bakkar, 2022: 291):

- Automation: It is a system that depends on the rules determined by programming, the machine here follows the predetermined logical series, which means that the symbol A logically leads to the symbol B and so on.

- Artificial intelligence: It is like teaching a machine to make its own conclusions, and realize what it should and should not do, encryption or coding here is not explicit as it allows the machine a certain amount of maneuver.

The Importance of Artificial Intelligence

They are as follows (Hassan, 2022: 214):

- Transfer human expertise to smart machines for storage and preservation.
- Reducing risks and psychological stress for humans, as smart machines can carry out arduous tasks that are difficult for humans to perform, in addition to work that is complex and requires high concentration and strong mental effort.
- The ability to make better decisions, as smart systems have accuracy, independence and objectivity, and therefore their decisions are far from error and bias, unlike humans.
- Facilitating communication between man and machine, instead of using complex programming languages, humans can use natural language to communicate with smart devices, which makes the use of smart devices accessible to all segments of society, including people with special abilities, after dealing with devices was the monopoly of programmers and specialists.

Challenges Facing Artificial Intelligence in Education (al Shipment, 2021: 199-200)

- paucity of availability of wireless communications infrastructure, computers and software.
- reestablishment of trainers and faculty members and the development of their traditional

skills to suit learning techniques and the use of computers.

- Reading large sections of the computer can cause eye strain.
- Smartphones may make it easier to cheat.
- Provide a more advantage to professionals using technologies than other students.

The First Axis: The Use of Artificial Intelligence in Improving Higher Education Outcomes

The university stage is one of the most dangerous stages that affect the personality of the individual, as the student is exposed at this stage to many problems and stressful events that require him to set the skills and experiences that qualify him to face these challenges, and these young people live at this time a rapidly changing world in various areas of life, in which they are going through social, academic, psychological and intellectual challenges that may stand in the way of achieving their goals and ambitions, hence the university's role in building and refining the student's personality and immunizing him psychologically and intellectually, To ensure that they adapt to modern-day developments (Abdellatif, 2022: 696). Scientific research in today's world is an inevitable priority for many developed and developing peoples, aiming at the progress and advancement of civilizations in various fields, as it is the backbone of universities, scientific institutes, research centers and their employees, and excellence in scientific research has become an urgent necessity to achieve sustainable development, as scientific research and the degree of its efficiency is a measure of the progress of societies (Al-Wahsh, 2021: 5).

The Concept of Scientific Research

Scientific research can be defined idiomatically as follows (Al-Qarala, Al-Omari, 2021: 141):

- Structured activity based on intentional observation.
- It aims to find a solution to a problem of the current or anticipated era.
- It is carried out by a researcher specialized in the cognitive and methodological aspect.
- It has specific characteristics and specifications.
- The study (Al-Zahrani, 2020: 190) summarized the most important trends in the definition of scientific research as follows:

- Definitions of scientific research as an art: a purposeful and practical art to describe the constant interaction between theories and facts in order to obtain meaningful facts, theories with predictive powers.
- Definitions of scientific research as an attempt: an attempt to discover, excavate and develop knowledge, examine and achieve it with careful investigation and deep criticism and then present it in an integrated presentation, and contribute to improving the quality of life.
- Definitions of scientific research as a solution: solving a problem through the systematic use of a number of methods and procedures to obtain the best solution to a problem than we can obtain in other ways, and it assumes access to new results, information or relationships to increase or verify people's knowledge.

The Importance of Scientific Research

Scientific research helps to add new information, and contributes to making new adjustments for the researcher in the following points (Othman, 2022: 143):

- Scientific research allows the researcher to rely on himself in acquiring information, and trains him on patience, seriousness and sincerity.
- Have a strong relationship between the researcher and the library.
- The researcher is allowed to view the various approaches and choose the best ones.
- Helps the researcher to delve deeper into the specialization.
- Helps to develop human knowledge by adding the innovator to it.
- Makes the researcher a different personality in terms of: thinking, behavior, discipline, movement, etc.

The importance of scientific research for society is as follows (Al-Ghobashi, Sharaf, Younis, 2022: 206-207):

- Prospecting for the facts that benefit man in overcoming the problems he suffers from, and in solving the problems that hinder his progress in all aspects of life, because scientific research reaches accurate results about the problem or phenomenon under study, and then provides a set of solutions and proposals to solve it.
- Scientific research helps the state to progress in all fields, thus enhancing its

competitiveness at the international level.

- The introduction of modern production methods to industrial activities and the increase in the production capacity of factories due to scientific development in production techniques.
- Scientific research is useful in overcoming difficulties by making the best use of all resources to overcome these difficulties and problems.
- Interpreting and predicting natural phenomena by reaching holistic laws governing these phenomena, so that we can control natural forces and harness them to serve man, and exclude the damage and disasters that may occur from them, so that they work to reduce their dangers.

Objectives of Scientific Research

The general objectives of scientific research are crystallized as follows (Mesel, Mikhail, 2021: 293-294). Research as a means of formation: It achieves the following objectives:

- Development of scientific preparations.
- Training on modern methods and techniques.
- Building new models.
- Scientific research as a means of knowledge: It achieves the following objectives:
- Expanding the field of knowledge and developing competencies.
- Transfer of scientific and practical knowledge.
- Scientific research as a means of liberation: It helps in achieving the following goals:
- Facing problems by relying on personal knowledge is a variety of freedom from traditional cognitive frameworks followed through imitation and indoctrination.
- Scientific research as a means of promotion: helps in achieving the following goals:
- Development and renewal of scientific knowledge.
- Obtaining a scientific or academic degree.

Benefits of Scientific Research

They can be identified as follows (Owais: 2021, 270):

- Get used to the scientific method in studies and discoveries in all scientific fields, and in facing the problems facing the individual in life.

- Get used to critical reading.
- Learn about the library and how to refer to sources and references.
- Exploiting leisure time for the benefit of the individual and society and eliminating the feeling of helplessness.
- See the way to write in the search and arrangement, discussion and abbreviation, and access to results and solutions.
- Get used to accuracy and order and reduce mistakes.
- Learn how to collect, organize, classify and link information.

Types of Scientific Research

Scientific research activities can be divided into three types, namely (Al-Sayed, 2021: 1439):

- Basic research: It is theoretical research that has been carried out primarily to acquire new knowledge such as: the foundations behind observable phenomena and facts, and to test hypotheses without any specific application.
- Applied research: It is the collection of information and fact-finding in order to acquire new knowledge directed primarily towards a specific practical goal, such as research and experiments in the field of physics, chemistry, engineering, and medicine.
- Experimental research and development: It is systematic work organized based on the knowledge gained from research and practical experimentation, and the production of additional knowledge directed to produce new products or processes, or to improve existing products or processes.

Obstacles to Scientific Research in Egypt

The difficulties of scientific research can be summarized in the following points (Mahmoud, 2022: 218-219):

- Lack of sources of knowledge: references, periodicals, scientific journals.
- Poor interest in holding scientific conferences and seminars.
- The spread of an atmosphere of jealousy among researchers instead of mutual scientific cooperation or fair competition.

- Absence of scientific research objectives, policies and strategies.
- Migration of scientific competencies to Western countries.
- The lack of motivation among Arab researchers, as conducting research for them is limited to promotion, fixation and material gain.
- The absence of relevance of scientific research to the problems of Arab societies.
- Scientific research is not related to the problems of Arab societies.
- The large number of teaching loads for faculty members.
- Lack of budgets allocated for scientific research and funding for research.
- Lack of researchers, and lack of interest in them.
- Lack of time devoted to scientific research.
- Lack of application of theoretical research.
- Low availability of an information base in Arab production centres and institutions.
- Lack of appropriate incentives for innovators in scientific research.
- The absence of a link between scientific research and development.

Obstacles related to Scientific Research Institutions (Arnaut, 2020: 20)

1- Weak budget allocated for scientific research.
2- Weak infrastructure requirements for the scientific research system.
3- Lack of sources in central libraries, and the weak use of digital technology in classifying sources in them.
4- Weak incentive incentives and lack of financial and moral rewards for distinguished researchers.
5- Increasing the teaching load and administrative tasks, and the lack of finding sufficient time or a clear state of mind as a result of quarrels in the work environment, and the lack of creating the appropriate environment for researchers that facilitates them to conduct their research.
6- Low encouragement of researchers to provide distinguished scientific research.
7- Scarcity of relevant research tools.
8- Poor availability of specialized and equipped research centers.
9- The difficulty of administrative procedures, especially in funded research to accept individual and collective research projects, and sometimes assigned to scientifically weak researchers, which constitutes a financial waste in conducting undistinguished

research and leads to a decline in the classification of universities regionally and internationally.

10. Rules and regulations for scientific promotions.

Benefits of the Applications of the Fourth Industrial Revolution in the Field of Scientific Research Development (Mohammed, 2021: 1468)

1- Facilitating access to sources of information, references, and scientific periodicals that are lacking in the university's libraries and various colleges.
2- Easy access to large electronic databases from comprehensive digital libraries, official websites of universities, and research centers containing magazines, periodicals and e-books.
3- Using e-mail, Instagram and WhatsApp to correspond with international scientific journals and societies to publish scientific research or to subscribe to journals and periodicals issued by them.
4- Ease of verification by researchers of the reliability and credibility of sources, and a comparison between those sources.
5- Freeing researchers from obstacles and restrictions of time and place permanently, as it is easy for them to access information in databases at any time and from wherever the researcher is.
6- Virtual training for researchers from distinguished international training centers on indexing, documentation and classification skills for all scientific references used in scientific research.
7- Preparing and managing the research team efficiently and effectively to ensure the success of the research project based on a group of geographically distant researchers.

Applied Models for the Application of Artificial Intelligence in Egyptian Universities in the Development of Scientific Research

Some Egyptian universities have activated artificial intelligence applications in scientific research, including the following (Al-Zuhairi, Al-Ansari, Al-Shafi, 2021: 86-87):

- 18 incubators were established with a total funding of EGP 50 million, ranging from public incubators to incubators specialized in artificial intelligence, the Internet of

Things, electronics education, virtual reality and augmented reality, which supported 90 technology companies, and the establishment of an artificial intelligence incubator in cooperation with Ain Shams, Alexandria and the Ministry of Planning.

- Ministerial Resolution No. 137 of 2020 was issued regarding the establishment of a technological incubator at Alexandria University under the name: (Alexandria University Technological Incubator for Smart Systems) at the Faculty of Engineering, Alexandria University.

The Ministry of Higher Education and Scientific Research has also witnessed outstanding achievements in education in terms of smart digital transformation, as it adopted projects for higher education institutions in Egypt, represented in (Al-Khoulani, 2021: 1431-1432):

- Establishing universities and smart educational complexes through the development of building management systems, smart access control and raising the efficiency of human energy.
- The electronic testing project, including equipping test centers, testing system software, and preparing question banks.
- The project of launching electronic platforms and portals, including: the website of the Ministry of Higher Education and Scientific Research, the unified portal for universities, the Internet of Things, the portal for researchers, and the unified portal for project funding agencies.
- Educational content initiative, including: digital books, virtual labs, content development tools, conferences, and workshops.
- Learning management projects, student information systems, institutional management systems, automation of the ministry's sectors, secured certificates, and electronic signature.
- The initiative to raise the efficiency of the infrastructure in colleges, cover the campus with a wireless network, raise the speed of the Internet, support the initiative of a device for every student, and the establishment of the Cloud Computing Center and high-performance computers.

The Use of Augmented Reality in Teaching Scientific Research Methods Methods

This is done through the use of the following applications (Thumis, 2022: 160):

- Zappar application: There are many applications used in creating augmented reality, including: zapworks and its mobile application ZAPPAR, and this application is one of the most important applications used in creting augmented reality application, as it is easy to use, and the application allows adding both image images, building photo albums, vide clips, audio clips, and text text, and also allows adding a button link to a site on facebook or twtter, as well as a calendar event contact canbe added, and can adding a web link website, so that the user can build the scientific material through so thet the user can build the scientific material through images, videos, audio clips and websites, which helps to clarify the idea and communicate the information to students.
- Academic achievement: If we want to reflect on what is meant by academic achievement, we can say: it is the amount of educational goals achieved by the learner in a particular subject as a result of passing through learning and educational experiences and attitudes, as for the procedural definition of academic achievement: It is a set of concepts, skills and information acquired by second-year students in the Department of Library and Information at the Faculty of Arts, Menoufia University, as a result of their study of the course of scientific research methods using "augmented reality" technology, and achievement is measured by the scores obtained by students in the academic achievement test prepared To achieve the goal of study.
- Scite tool for AI-powered citation assessment: Scite: A Brooklyn-based startup that helps researchers better discover and understand research articles through smart citations and citations that display the context of the citation and describe whether the article provides supporting or contradictory evidence, researchers and students from around the world use scite, and is partly funded by the National Science Foundation and the National Institute on Drug Abuse of the National Institutes of Health, Scite helps you track whether an article has been supported or questioned by authors others, and give release or undo notices relevant to you (scite Inc., 2022).

Artificial Intelligence Tools and Applications to Improve Scientific Research Outputs

- Trinka tool: Trinka is the world's first grammar and language improvement tool designed specifically for academic and technical writing, Trinka stands out by working with the author and bypassing grammar and spelling to ensure comprehensive language optimization, Trinka works to improve your writing style,

delivery, and wording to match academic writing conventions and best practices; so you can focus more on your ideas, examining plagiarism using the most advanced text similarity detection algorithm, iThenticate and the largest paid published database covering all scientific fields (Crimson AI, 2022).

- Bit.ai tool: With the spread of the pandemic and most researchers turned to online searching, and this includes browsing many websites, blogs, articles, videos, and images; to find the right location for research, Bit.ai: It is an artificial intelligence tool that allows researchers and teams to collaborate, share, track, and manage all information and research in one place, it is one of the artificial intelligence tools for researchers, and helps in sharing multidimensional research with their peers easily, the main advantage of the tool is: That they can store media assets and aids in real-time collaboration with peers or fellow researchers. (Bit Tech Labs Inc., 2022)
- GanttPRO tool: Researchers need robust planning to organize, plan and stay focused on all activities, so GanttPRO: is an artificial intelligence tool for researchers that makes things easier for researchers and groups of any size; to plan their tasks on a visually appealing Gantt chart timeline, check progress, and all deadlines, and also allows researchers to design or create an unlimited number of tasks, task groups, and subtasks in one timeline. Make dozens of ready-made templates, and have an elegant user interface with a short learning curve (GanttPRO, 2022).
- IRIS. AI: It is or is a powerful software suite where your research content is in the center, and you can upload any set of research documents, or connect directly to the live agent dataset, such as: publisher, patent authority, internal repository, or any other source relevant to your research, and when you add content you can access a variety of smart tools that you can apply and combine as needed, and each search is slightly different from others, and your search space will work to enable any workflow (Iris.ai AS,2022).
- Mendeley tool: It is a free reference manager that can help you store, organize, observe, share, and cite references and research data, automatically generate bibliographies, easily collaborate with other researchers online, easily import papers from other research programs, search for relevant papers based on what you read, and access your papers from anywhere online (Mendeley Ltd,2022).
- EndNote Tool: It is a software package for managing commercial references, used to manage references when writing articles, reports, and articles, and keeps all references

and materials related to references in a personal searchable library (clarivate.libguides: 2022).

- Zotero Tool: It is a free and easy-to-use tool to help you collect, organize, comment, cite and share research, Zotero helps you organize your search the way you want, you can sort items into groups and tag them with keywords, or create saved searches that automatically populate with relevant materials as you work, Zotero instantly creates references and bibliographies for any text editor, directly within Word, LibreOffice and Google Docs by supporting more than 10,000 citation styles, and you can format your work to suit Any directory or style publication, Zotero can optionally sync your data across devices while seamlessly keeping your files, notes and bibliographic records up to date, and if you decide to sync you can also always access your search from any web browser, a project of the Digital Grants Foundation, a non-profit organization dedicated to developing programs and services for researchers and cultural heritage institutions, and is developed by a global community (Corporation for Digital Scholarship, 2022).
- Tool (TLDRs): Semantic Scholar: It is a free AI-powered research tool for scientific literature, based at the Allen Institute of Artificial Intelligence, the semantic researcher provides free research and discovery tools based on artificial intelligence, and there are open resources for the global research community, and the TLDRs tool is very short summaries of the main objective and results of the scientific paper created using specialized background knowledge and the latest NLP techniques in the GPT-3 style, and this new feature is available in beta version for nearly 60 million Research paper in Computer Science, Biology, and Medicine (Semanticscholar: 2022).
- Enago Plagiarism Checker: Enago Plagiarism Checker uses the most advanced text similarity detection algorithm, in partnership with Turnitin along with the largest online database, paid research in all scientific fields, and all open access research; to give researchers the best possible plagiarism screening, through which the researcher obtains the most accurate percentage of plagiarism using advanced comparison technology that excludes references and content quoted from it, in addition to providing color discrimination for easy identification, it contains advanced settings and user-friendly filters; To exclude partitions and warehouses if necessary.
- Duplichecker website: It consists of a set of tools, the most important of which are:

text analysis tools, high-quality search engine optimization, and the goal is not only to build tools but search engine optimization and content marketing to become available to people all over the world for free, and more than 100 wonderful tools have been created so far, some of them are as follows (DupliChecker: 2022):

- Plagiarism checker. * Paraphrasing tool * Reverse image search.
- Backlink checker. * Free agent list. * XML sitemap generator.
- Backlink generator. * Malware tracker. * Site link analyzer. * Keyword research tool.

- Enago's Open Access Journal Finder (OAJF): Enago's Open Access Journal Finder (OAJF) protects you from predatory publishers by allowing you to find pre-vetted, high-quality open access journals for free, this unique researcher solves familiar issues regarding journal legitimacy, predatory journals, and article processing fees using a verified journal index issued through the Open Access Journal Directory (DOAJ), and Enago's exclusive search algorithm allows you to shortlist journals Highly suited for your business and research purposes, maximizing publishing opportunities (Crimson Interactive Inc., 2022).

The Second Axis: The Use of Artificial Intelligence in Confronting Extremism

In view of the huge encroachment of the digital virtual society on real societies, the concept of the state itself has undergone many changes, so the concepts of geographical boundaries between societies have disappeared, and the concept of sovereignty, social or culture has been subject to preservation or assault, sovereignty has become distributed to a large number of other social actors with the state, which led to explicit threats to what is known as intellectual security, which is related to preserving the social and cultural aspects of society, in a way that ensures the preservation of cultural identity in all its vocabulary (slave). Rahman, 2022: 1543).

Therefore, higher education plays a major role in preventing the spread of extremism and terrorism, through the curricula and philosophy on which education is based, and the methods and methods of education used, whether they support freedom of opinion and self-expression or are they systems that suppress freedoms, and the educational system must be based on meeting the needs of learners and preventing the infiltration of extremist ideas. From this

point of view, there is a need to identify extremism and ways to treat it using artificial intelligence.

The Concept of Extremism

In language, extremism is defined as the one who has reached the extreme, and the extreme in language is what is close to its end, and it has been said that it is more than half. And the end of everything ends. In Lisan al-Arab, Ibn Manzur said: The extreme of a thing has become an extreme, and the sun has become extreme, meaning it has approached sunset (Ibn Manzur, 1984, 32).

Extremism is defined as "excessive or intolerant and transgressive of moderation and moderation, and non-acceptance of the opinions of others, which leads to a departure from the intellectual rules, values, standards and behaviors common in society (Al-Ghamlas, 2021: 157).

Explanation of the Phenomenon of Extremism

Young people are considered one of the groups in society most vulnerable to extremism, due to the age characteristics and special psychological traits that characterize the youth stage, as young people tend to replace the traditional cultures of adults with their own cultures, and they emphasize their privacy, their tendency to relative independence, and non-compliance with the values and standards prevailing in the world. The society. Manifestations of extremist tendencies appear among young people, such as some tending towards isolation and negativity, or some following extremist behavioral tendencies that reach the point of using violence and terrorism, trying to impose them on others.

These trends express a youth culture characterized by rejection of the values and authority exercised by adults in society. This rejection has become a unified general position that appears blatantly in many situations. Youth culture is an independent way of life. It is a type of language and special values that are dominated by the spirit of rebellion. Thus, this culture turns into a functional culture that does not serve the construction processes that society seeks, but rather tends towards adopting opposing ideas that express a blatant challenge to the

values and standards that society itself approves of (Zeid , 2021: 215).

Types of Extremism

Extremism has many types, including emotional extremism, which is emotional impulsiveness and intense emotionality towards a certain thing, religious extremism, which involves exaggeration and restriction in a way that contradicts the truth of religion with a wrong understanding of legal texts and their purposes; and intellectual extremism is when a person relates to certain ideas. It does not tolerate discussion or reconsideration, that is, it is a single-minded and visionary pattern. Social extremism is no different from intellectual extremism, as both go beyond moderation, which is exaggeration or negligence in behavior, whether that behavior is religious. Or social behavior, based on discrimination, intolerance and social closure in terms of methodology, thought and behavior, and deviating from the normal line of society and its customs and traditions. Finally, violent behavioral extremism is the most dangerous type of extremism, as extremism moves from the spaces of ideas and theoretical perceptions to realistic practices, expressing itself using physical means of violence, to achieve specific goals (yaduk, et al., 2023: 67).

Factors Leading to Extremism and Helping to Make it

There are many factors that lead to militancy and extremism among young people and change their behavior from moderation to extremism, as follows (Hilal, et al., 2021: 302):

- Marginalization and discrimination: It must be said that it is never permissible, in any case, to justify treating individuals belonging to the same society in a different manner socially and legally, with the intention of discriminating some and marginalizing others, so that one group does not feel superior and one group feels inferior, and grudges and grudges arise as a result, which through their accumulation leads to the formation of a nucleus for extremist ideas.
- Long-standing and unresolved disputes: Protracted and unresolved disputes tend to provide fertile ground for radicalization.
- Hateful intolerance of opinion or doctrine: Hateful intolerance of opinion, person, or doctrine, and the sanctification of a single opinion, are among the factors that help to create an extremist or terrorist.

- Unemployment, poverty and corruption: Unemployment is one of the most important reasons that drive the behavior of intellectual extremism, terrorism and violence, as it is one of the complex problems facing Egypt, and the seriousness of the problem of unemployment can be realized given the negative effects of this phenomenon.

The Role of Education in Countering Extremism and Violence

Education has only recently gained a role in preventing violent extremism and deradicalizing young people. Education cannot prevent anyone from joining a related CVE ideology, but the relevant quality of education can help in a safe environment that makes it difficult for CVE ideologies.

When schools do not provide students with a good quality of education including opportunities to define their future and learn about sensitive issues related to local and global conflicts and tensions, students try to find answers from less reliable sources of information, which can be manipulated by extremists (Emrah KOÇAK, Mehmet TOKGÖZ, 2017:48).

University Strategies in Confronting Extremism

The strategies used to counter extremism are varied, as follows (Atta, 2021: 173):

- Behavior change strategy: trying to modify students' extremist ideas.
- Cooperative learning strategies: to develop the spirit of cooperation between institutions concerned with all youth.
- Persuasion strategies: in cooperation and coordination between all bodies and institutions concerned with youth by providing mechanisms to increase the awareness of university youth of their responsibilities and support their capabilities.
- Communication strategy: by providing training courses and workshops to prepare employees in various institutions and increase their awareness of the problem of extremism and how to confront it.

The Role of University Professors in Confronting Extremism

The most important roles played by university professors can be identified as follows (Al-

Etrebi, Al-Shukhaibi, 2022: 112):

- A good example for his students to provide them with the values and ethics of intellectual security.
- Directing the social interaction of students properly through his participation in student activities and leading family committees.
- Motivating students to work collectively and the need to practice it, which contributes to students' interaction with community issues and problems and maintaining its intellectual security.
- Appreciates and respects students' opinions and ideas, and encourages them to express their opinions without fear, even if they differ from his point of view.
- Motivating his students to adhere to religious, national and national principles and constants.
- Seeking to include in academic courses topics and issues that enhance and raise the values of reason and thought.
- Organizing training courses to provide students with behaviors to maintain intellectual security.
- What the university can do to counter extremism through scientific research (Ghazi, et al., 2021: 230-231):
- Directing scientific research to find out the causes of extremism.
- Directing scientific research towards moderation and moderation in Islam.
- Directing scientific research to confront the problem of extremism.
- Directing scientific research towards the virtues of tolerance in Islam.
- Directing scientific research towards the tolerant ethics of Islam.
- Promoting the movement of scientific authorship and production in a way that adapts science to serve Islamic thought.
- Discuss the needs of society and problems and respond to the requirements.
- Recruiting scientific research to serve the country and overcome problems.

Egyptian Efforts to Enhance the Role of Gender to Prevent Extremism

The Egyptian government has made many visions that contribute to reducing violence and extremism, as follows (Mahmoud, 2021: 896-904):

- Egyptian Constitution 2014: The State guarantees equality between women and men

in all civil, political, economic, social and cultural rights in accordance with the provisions of the Constitution.

- The establishment of the Supreme Council for Countering Terrorism and Extremism in 2018: with the aim of adopting a comprehensive strategy to confront terrorism and prevent violent extremism in its comprehensive sense.
- Special amendments to combat extremism: the penalty for those who promote extremist ideas calling for terrorist acts, whether orally, in writing or by any other means, has been increased.
- Launching the first national strategy to combat violence against women (2015/2020) on 27/4/2015.
- Establishment of Dar al-Iftaa in 2014 "Observatory of Takfiri Fatwas: The Observatory aims to address the phenomenon of takfir fatwas and extremist opinions in various local and international media, and seeks to provide intellectual and religious treatments of this phenomenon and its effects.
- The field study is a model of cooperation between the state and civil society, such as the "door-knocking campaign": a campaign organized by the National Council for Women with the aim of communicating with the largest base of women to identify their problems and needs.
- Various media efforts such as the campaign "Taa Marbouta, the secret of your strength or the 16 days campaign to combat violence against women": a media campaign to communicate with the masses and spread awareness.
- The "Women Peacemakers" initiative issued in 2017: It was co-written by 7,000 women from all governorates of Egypt, which set a clear map of how women can contribute to combating extremism and terrorism from its intellectual and social roots.
- Project for the development of unsafe areas and slums: which are hotbeds of extremism.
- Egypt launched the "Egypt Launches" program in 2018: which aims to address the conditions driving terrorism and support the values of stability and loyalty to the state.
- Development of social protection systems and networks: aims to reduce the burden of a specific set of social risks for families and individuals.
- Decent Life Initiative: It aims to provide decent housing for the most vulnerable families, provide basic infrastructure for the most needy villages, health and

educational interventions through medical and other convoys, and establish micro-projects to generate a stable income for citizens, as well as human development and community quality for the groups participating in the initiative.

- Conditional cash support program "Takaful and Karama": About 2.2 million families benefit from this program.
- Social Housing Project: which aims to provide housing units for young people.

Applications of Artificial Intelligence in the Face of Extremism and Violence

- Identify red flags of radicalization: There is a case for the use of AI to combat cyberterrorism related to the use of AI-enabled technology to help identify individuals at risk of radicalization in online communities to facilitate appropriate investigation and intervention. NLP can be used, for example, to identify keywords that may indicate a state of radicalization in a social media account or an individual's exposure to online terrorist narratives. It may also be helpful to identify specific behavior patterns of individuals, such as consuming or researching terrorist and violent extremist content that fits indicators of radicalization (United Nations Office of Counter-Terrorism, 2021: 26).
- Exposure to radicalization: Some tech companies have developed tools to assess exposure to violent extremist ideologies. A tech company has launched a project (Method of Retargeting), which targets users of video-sharing sites who may be vulnerable to propaganda from terrorist groups and redirects them to videos that adopt a credible counter-narrative (Islamic Military Counter Terrorism Coalition, 3:Jan. 2020).
- Knewton's Alta: is a revolutionary AI tool in education that is changing the way we approach higher education. This adaptive educational program uses artificial intelligence to adapt to students' needs, creating a personalized learning experience that ensures success in their academic endeavors. Students can now learn at their own pace and get individual feedback, making achieving academic excellence easier than ever. Knewton's Alta strength lies in its ability to adapt to each student's unique learning style. The AI-powered program analyzes data related to a student's past performance and knowledge gaps, allowing them to create personalized recommendations for more effective sessions. This level of personalization ensures

that two students don't have the same experience (Toolsai .net, March 10, 2023). Using the platform, students' behavior can be analyzed, their learning needs identified, and educational content tailored to each student's needs can be delivered, so that students are reoriented and their involvement in extremism and terrorism is reduced.

- Perspective API: The tool uses machine learning models to identify abusive comments. It records the phrase based on the perceived impact that the text may have on the conversation. Developers and publishers can use this result to provide feedback to commenters, help moderators review comments more easily, or help readers filter the language." The tool can determine the toxicity of comments or if they are an attack on identity, sexual threats, insults or insults, and there are some of them in Arabic and it is a free tool, and it analyzes extremist discourse, determines its sources and methods of spread, and identifies the linguistic methods used in it, and is used in higher education to know unusual behaviors to confront them (perspectiveapi).
- Terrorist Content Analysis Platform (TCAP): It is a secure online tool that automates the detection and analysis of verified terrorist content on the Internet. To ensure accuracy and accountability, TCAP development began with a multilateral consultation process on the topic of ensuring transparency by design, seeking insights from civil society groups, technology companies, and academics. This consultation is also integrated into the design of the tool in order to ensure appropriate mechanisms to support human rights, freedom of expression, transparency and accountability (UNDP, 2022: 10).

Through the previous presentation of some artificial intelligence tools used in confronting extremism, higher education can benefit from them in identifying students exposed to extremism and targeted and then providing supportive curricula for them by meeting their needs so that they provide appropriate support to students according to their needs and the type of extremism they suffer from, and also artificial intelligence can be used to identify the causes of extremism and accordingly treat the problem from the beginning, whether the reason is economic, political, social or religious, and accordingly Artificial intelligence to provide supportive curricula according to the type of extremism and its cause.

Study Recommendations

In this last part of the study, and based on what has been presented, the research presents some recommendations that the study believes should be adopted by higher education in egypt , in order to achieve the maximum benefit from artificial intelligence in the field of scientific research, and help improve the outputs of scientific research, and they are summarized as follows:

- The need for cooperation between MCIT, the Academy of Scientific Research and Higher Education and stakeholders to provide AI tools in Arabic in the field of scientific research.
- The need for cooperation between faculty members in the faculties of computers, information and artificial intelligence to develop plans to raise the efficiency of the performance of university professors in the field of using artificial intelligence in scientific research, and teaching research methods using artificial intelligence.
- Providing training programs for graduate students on how to benefit from artificial intelligence tools and applications in the field of scientific publishing and scientific research, and the information collected in this regard must include:
  1- Priorities of training and trainee needs.
  2- The current status of training and the trainee, and the infrastructure in universities and training centers, taking into account the obstacles and ways to address them.
  3- Weaknesses and strengths that need to be developed by universities and scientific research centers.
  4- Types of training programs preferred by those concerned with artificial intelligence.
  5- The expected cost of implementing training and development programs.
- Holding conferences and seminars to spread the culture of artificial intelligence, and the importance of its application in the field of scientific research.
- Encouraging future researchers to study artificial intelligence.
- Taking advantage of artificial intelligence tools used in international scientific research in creating tools in Arabic that are in line with the nature of Arab scientific research.
- On the issue of extremism, we can reach the following:
- The need to provide an artificial intelligence tool that carries an Arab character to

confront the problems facing students and lead to their radicalization.

- The need to provide a platform or database that follows the trend of extremism in universities and train university professors on how to benefit from its outputs to improve the quality of education in order to provide education that serves society and eliminates the causes of extremism in Arab societies.
- Provide educational curricula supported by artificial intelligence that provide values and guiding principles that limit the spread of extremism.

References

Abdel Latif, M. S. M. (2022). The effectiveness of a training program on constructive thinking skills in decreasing psychological defeatism and tendency towards intellectual extremism among university students. *Educational Journal*, *97*, 693–775.

Abdel Rahman, I. A. N. (2022). Intellectual security in the digital society: Towards constructive social engineering. *Journal of the Faculty of Arts*, *14*(2), 1542–1604.

Ahmad, S., Malik, M., & Batool, A. (2018). Perceptions of university students about causes of terrorism. *Bulletin of Education and Research*, *40*(3), 115–127.

Ahmed, A. F., & Salem, Z. M. H. (2022). Artificial intelligence technologies and their effects on the effectiveness of information institutions' content and services: A prospective study. *Arab International Journal of Library and Information Studies*, *1*(3), 27–70.

Al-Namnam, H. (2016). *Egypt and the challenges of terrorism*. Thirteenth Annual Conference of the Egyptian Council for Foreign Affairs, Cairo, Egypt.

Al-Shipment, A. M. H. (2021). A proposed vision for developing the performance of higher education institutions in Egypt in the light of artificial intelligence. *Journal of the Faculty of Education*, *36*, 174–233.

Al-Bishr, M. A. M. (2020). Requirements for employing artificial intelligence applications in teaching Saudi university students from the point of view of experts. *Journal of the College of Education*, *20*(2).

Al-Etrebi, H. M., & Al-Shukhaibi, R. A. (2022). The educational role of the university in confronting intellectual extremism: A critical analytical study. *New Horizons in Adult Education*, *31*, 59–128.

Al-Ghamlas, B. B. S. (2021). The impact of social networks on spreading extremism and terrorism. *Journal of Education*, *191*(2), 149–198.

Al-Ghobashi, M. A., Sharaf, S. S., & Younis, M. M. (2022). Supporting scientific research at Menoufia University and ways to improve it. *Journal of the Faculty of Education*, *37*(3), 190–232.

Al-Habbal, A. (2023, February 2). The minister of solidarity reviews the results of the research "The cost of extremism and terrorism in Egypt in three decades." *Al-Masry Al-Youm*. https://www.almasryalyoum.com/news/details/2808956

Al-Khoulani, M. M. I. (2021). Activating smart digitalization in Egyptian universities in the light of the Fourth Industrial Revolution. *Educational Journal*, *87*, 1409–1498.

Al-Qarala, A. Y., & Al-Omari, M. K. M. (2021). Scientific research: Its concept, objectives, and impact on preserving the necessary purposes of Islamic law. *Al-Mizan Journal for Islamic and Legal Studies*, *8*(1), 141–172.

Al-Wahsh, H. M. (2021). Development of scientific research in the fundamentals of education in light of contemporary global trends: A futuristic vision. *Journal of the Faculty of Education*, *100*, 2–38.

Al-Zahrani, A. M. Y. (2020). Learning styles and their relationship to scientific research skills among gifted students. *Journal of the Faculty of Education*, *36*(10), 176–195.

Al-Zuhairi, I. A., Al-Ansari, M. S., & Abdel Shafi, A. M. (2021). Application of artificial intelligence in higher education in Egypt in the light of the cultural context. *Journal of Educational Sciences*, *49*, 72–101.

Arnaut, B. I. A. (2020). Quality of scientific research: Criteria, requirements, obstacles, and developmental procedures from the researcher's point of view (Qualitative study using grounded theory). *Educational Journal*, *69*, 1–27.

Atta, M. G. T. (2021). Intellectual extremism among Assiut University students and ways to confront it: A field study. *Educational Journal for Adult Education*, *3*(3), 159–180.

Bakari, M. (2022). Challenges of artificial intelligence and its applications in education. *Journal of the Forum for Economic Studies and Research*, *6*(1), 286–305.

Bit Tech Labs Inc. (2022). *Sign in*. https://bit.ai/features

Christodoulou, E. A. (2020). Boosting resilience and safeguarding youngsters at risk: Critically examining the European Commission's educational responses to radicalization and violent extremism. *London Review of Education*.

Clarivate. (2022). *EndNote training* [Web page]. https://clarivate.libguides.com/endnote_training/home

Corporation for Digital Scholarship. (2022). *Zotero* [Web page]. https://www.zotero.org

Crimson AI. (2022). *Trinka AI features* [Web page]. https://www.trinka.ai/features

Crimson Interactive Inc. (2022). *Journal finder* [Web page]. https://www.enago.com/researcher-hub/journal-finder.htm

DupliChecker. (2022). *About us* [Web page]. https://www.duplichecker.com/about-us

El-Sayed, A. I. A. M. (2022). Evaluating the performance of the scientific research sector in Egypt: An analytical study during 2005–2020. *Journal of the Faculty of Law for Legal and Economic Research*, (1), 1425–1536. Alexandria University.

Emrah, K., & Mehmet, T. (2017). *A guide for empowering teachers against extremism*. Turkish National Agency (European Commission).

Farag, K. H. A. (2021). The experiences of some universities in knowledge management in the field of scientific research and the possibility of benefiting from them in Egypt. *Journal of the Faculty of Education*, 32(125), 211–234. Benha University.

GanttPRO. (2022). *GanttPRO* [Web page]. https://ganttpro.com

Ghazi, R. F., Al-Shal, M. A. S. F., & Al-Najjar, F. R. A. (2021). The university and confronting the phenomenon of religious extremism: A descriptive study. *Journal of the Faculty of Education*, (103), 213–238. Kafr El-Sheikh University.

Hassan, Y. A. (2022). Artificial intelligence: Foundations and fields of application in libraries and information sciences. *Arab International Journal of Information and Data Technology*, 2(2), 209–218.

Hilal, E. A. H., Al-Wahsh, H. M., & Atta, R. I. M. (2021). Educational system and confronting thought extremism problems for the Egyptian citizen. *Journal of the Faculty of Education*, (103), 291–319. Kafr El-Sheikh University.

Hinojo-Lucena, F. J., Aznar-Díaz, I., Cáceres-Reche, M. P., & Romero-Rodríguez, J. M. (2019). Artificial intelligence in higher education: A bibliometric study on its impact in the scientific literature. *Education Sciences*, 9(1), 51. https://doi.org/10.3390/educsci9010051

Ibn Manzur. (1984). *Lisan al-Arab*. Dar Al-Maaref.

Iris.ai AS. (2022). *Iris.ai features* [Web page]. https://iris.ai/features/#analysis

Islamic Military Counter Terrorism Coalition. (2020). *Artificial intelligence and counterterrorism: Limitations, opportunities and risks*.

Khamis, F. I. G. (2022). The use of augmented reality technology in teaching the "Scientific Research Methods" course: An experimental study. *International Journal of Library and Information Sciences*, 9(1), 155–183.

Longo, L. (2019). Empowering qualitative research methods in education with artificial intelligence. In *Proceedings of the World Conference on Qualitative Research* (pp. 1–21). Springer. https://doi.org/10.1007/978-3-030-31787-4

Mahmoud, D. M. (2021). The gender approach to preventing violent extremism. *Nile Valley Journal for Humanitarian, Social and Educational Studies and Research*, 31(31), 869–912.

Mahmoud, H. M. H. (2022). A proposed vision for developing scientific research obstacles in the Arab world. *Arab Journal of Measurement and Evaluation*, 3(5), 207–224.

Mendeley Ltd. (2022). *Mendeley reference manager* [Web page]. https://www.mendeley.com/reference-management/reference-manager

Messil, M. A., & Mikhail, E. T. N. (2021). Scientific research as a mechanism to support entrepreneurship in South Korean university education. *Journal of the Faculty of Education*, 18(106), 271–406. Beni Suef University.

Mohamed, M. A. (2021). An evaluation study of the impact of the Fourth Industrial Revolution on the scientific research system. *Educational Journal*, 91, 1442–1501. Sohag University.

Mohammadi, M. (2021). The role of education in combating violent extremism in developing countries. *Shanlax International Journal of Education*, 9(3), 273–287.

Othman, L. (2022). Scientific research obstacles and methods to develop it. *International Journal of Research in Educational Sciences, Humanities, Literature and Languages*, 3(3), 140–156.

Owais, N. F. M. (2021). The role of intellectual property protection in supporting scientific research. *Scientific Journal of Libraries, Documents and Information*, 3(5), 255–381.

Sas, M., Ponnet, K., Reniers, G., & Hardyns, W. (2020). The role of education in the prevention of radicalization and violent extremism. *Sustainability*, 12(6), 2320. https://doi.org/10.3390/su12062320

Subroto, I. M. I., & Selamat, A. (2014). Plagiarism detection through internet using hybrid artificial neural network and support vector machine. *TELKOMNIKA*, 12(1), 209–218.

ToolsAI.net. (2023, March 10). *13 best AI tools for students*. https://toolsai.net/ai-tools-for-students/

UNDP. (2022). *From pilots towards policies: Utilizing online data for preventing violent extremism and addressing hate speech*.

United Nations Office of Counter-Terrorism. (2021). *Countering terrorism online with artificial intelligence*.

Yaduk, S. M., Al-Khawatara, S. F. K., & Al-Asfa, S. S. A. (2023). Awareness of extremism and its relationship to irrational thoughts. *Journal of Education*, 197(1), 61–97.

Zeid, A. H. Y. (2021). Radical discourse and campus violence. *Annals of Ain Shams Arts*, 49, 208–254.

Author Information

Elsayed Salama Elkhamisy
https://orcid.org/0009-0000-4963-6542
Faculty of Education
Damietta University -Egypt
Contact e-mail: *selkhamisy@yahoo.com*

Maryam Shawky Tera
https://orcid.org/0000-0001-9781-127X
Faculty of Education
Damietta University- Egypt

Citation

Elkhamisy, E. S. & Tera, M. S. (2025). The Uses of Artificial Intelligence to Improve Scientific Research to Confront the Problem of Extremism (A Field Study on Egypt). In M. Koc & O. T. Ozturk (Eds.), *Studies on Social and Education Sciences 2025* (pp. 181-213). ISTES.

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 involves seven chapters:

Chapter 1 - Attitudes and Practices of College Art Teachers towards Culturally Responsive Teaching in Art Creation Courses

Chapter 2 - International Research on College Students' Perceptions regarding the Impact of the Lasallian Mission on Their Development

Chapter 3 - The Unseen Revolution: Unlocking the Potential of Cross-Disciplinary Research

Chapter 4 - The First Women Painters in Turkish Painting and Their Development

Chapter 5 - Enhancing Research Methodology: The Role of Embedded Librarians in Supporting Academic Excellence

Chapter 6 - The Role of Interdisciplinary Approaches in Addressing Global Challenges

Chapter 7 - The Uses of Artificial Intelligence to Improve Scientific Research to Confront the Problem of Extremism (A Field Study on Egypt)

/ istesoffice

ISBN: 978-1-952092-87-9