The Power of Visuals: *The Significance of Higher Education Teacher Professional Development in Visual Literacy in Kuwait*

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Abstract

This study explores the role of higher education professional development in the integration of visual literacy instruction at the university level. Visual literacy is a crucial skill that empowers students to comprehend and generate visual content across diverse domains. However, many instructors lack necessary training and support to effectively incorporate visual literacy into their teaching practices. The research survey investigates the significance of teacher professional development in visual literacy implementation, encompassing the status of training, effective professional development programs for teachers, suitable teaching methods, education technologies, attitudes of higher education instructors towards visual literacy, and the influence of student engagement with visual materials on visual literacy advancement in Kuwait. The questionnaire was administered to a sample of higher education teachers. That data was analyzed employing descriptive and inferential statistical techniques, with SPSS v.26 software. Regression analysis and other multivariate analyses were conducted to test the research hypothesis and model. The outcomes should provide insights into the effectiveness of collaborative, experiential, and technology-enhanced teacher professional development programs in fostering visual literacy development within higher education, the significance of student engagement with visual materials, and the necessity for further research on effective teaching methods and educational technologies for promoting visual literacy. The findings can inform policy and practice by highlighting the importance of equipping higher education instructors with necessary skills and resources to effectively incorporate visual literacy into their teaching approaches, enhancing the quality of higher education by fostering competencies among students and facilitating their engagement with visual materials across various disciplines.

Keywords: visual literacy, professional development, teacher education, student engagement

1. Introduction

Visual literacy is defined as the ability to interpret and create visual materials in various contexts; it is considered an essential skill in today's visually oriented society (Bristor, 2019; Hobbs, 2017). The increasing prevalence of visual media and digital technologies has amplified the need for individuals to effectively analyze, understand, and communicate through visual representations (Dondlinger, 2007; Zeyab, 2017). Within the educational context, visual literacy is particularly relevant as it empowers students to critically engage with visual information, enhances comprehension and communication skills, and promotes overall cognitive development (Freeman & Burkholder, 2019). Prospective teachers play crucial roles in fostering visual literacy skills among students. As educators, they are responsible for designing and implementing instructional activities that incorporate visual elements to enhance learning experiences (Bamford, 2016; Bristor, 2019). However, research indicates that many prospective teachers may lack the necessary training and support to effectively integrate visual literacy instruction into their pedagogical practices (Koehler & Mishra 2008). This highlights the importance of comprehensive teacher professional development programs that address the specific needs of prospective teachers in developing their visual literacy competencies.

Visual literacy is an essential skill for students in higher education, enabling them to interpret and create visual materials in various contexts (Huilcapi-Collantes et al., 2020). Professional development programs provide

opportunities for teachers to enhance their knowledge, skills, and attitudes related to instructional practices (Desimone, 2009; Yoon et al., 2007). These programs can offer prospective teachers the theoretical foundations, practical strategies, and technological competencies needed to integrate visual elements into their teaching practices (Bamford, 2016). By equipping prospective teachers with the necessary tools and pedagogical approaches, these programs have the potential to positively impact students' visual literacy development (Zeyab.2017).

Despite the importance of these programs in promoting visual literacy among prospective teachers, limited research has focused specifically on the role of such programs in higher education (Zeyab, 2017; Kelly & Kortegast, 2023). The purpose of this study is to investigate visual literacy development among prospective teachers and explore the role of professional development training programs in higher education. By examining the experiences, perceptions, and outcomes of prospective teachers who have participated in such programs, this study aims to provide valuable insights into the effectiveness and significance of such programs in promoting visual literacy competencies among educators.

1.1 Focus of the Study

The research focuses on the significance of higher education teacher professional development in implementing visual literacy, using a research survey design. The research questions focus on the current states of visual literacy development in higher education, effective teacher professional development programs, teaching methods and education technologies, attitudes of higher education teachers towards visual literacy, and the impact of student engagement with visual materials on visual literacy development. The survey was distributed to a sample of higher education teachers, and the data has been analyzed using descriptive statistics and inferential statistics. The study aims to identify strategies for improving visual literacy instruction and learning outcomes. The findings of this study will contribute to the understanding of the effectiveness and impact of teacher professional development programs in promoting visual literacy among prospective teachers, gaining insights into the key components and strategies that contribute to successful outcomes. The study aims to inform the improvement of visual literacy instruction and learning outcomes in higher education by identifying effective strategies and approaches. By equipping prospective teachers with the necessary knowledge and skills, these programs have the potential to enhance visual literacy competencies among educators, ultimately benefiting students' visual literacy development. The dependent variable is visual literacy development, while the independent variables include teaching methods, educational technologies, and the attitude of teachers toward visual literacy.

1.2 Research Questions

RQ #1. How does participation in teachers' professional development training programs at the higher education level influence the visual literacy development of university teachers?

RQ #2. What are the effects of teachers' professional development training programs on the integration of visual elements in the instructional practices of prospective teachers?

RQ #3. To what extent do teachers' professional development training programs enhance the knowledge of visual literacy?

RQ #4. How does the visual literacy development of prospective teachers, as facilitated by teachers' professional development training programs, impact student engagement and learning outcomes.

2. Literature Review

2.1 Definition, Conceptual Framework, and Theoretical Perspectives of Visual Literacy Development

Today, competency in visual literacy is an essential skill for educators, students, and citizens in general. It includes extensive skills vital to navigating our modern world and workplaces via the sizable expanse of statistics and the superiority of visual-orientated content material. Visual literacy includes the ability to decipher, compare, and convey ideas through numerous visible factors, including pictures, graphs, charts, diagrams, films, and different types of visual media. However, visual literacy goes beyond simple aspects of visible representations. It delves deeper into vital mental exploration, cultural sensitivity, and the capacity to extract profound meanings from visible messages (Albion et al., 2015). Individuals with talent in visual literacy possess the skills to decode and recognize visible statistics correctly, perceive the intended messages, and acknowledge the broad effects of visual culture on society.

The ability to master this skill goes beyond just artists and designers; it is increasingly significant in a wide range of fields and careers, such as education, business, marketing, and journalism (Schwartz, 2018). Visual literacy plays a vital role in education, as it enables students to effectively interact with intricate concepts and express thoughts in a

creative manner. Not only does it benefit learners, but it also supports educators in crafting captivating teaching resources and fostering dynamic learning environments (Lehmuskallio, 2019).

Many different viewpoints contribute to grasping and advancing visual literacy. Cognitive learning theories delve into how people absorb and retain visual data. Mayer and Massa (2003) recognize three aspects influencing visual and verbal learners: cognitive capacity, cognitive approach, and learning inclination. They underscore the fact that individuals may possess particular inclinations toward processing either visual or auditory information.

Mayer and Moreno (2003) investigated diminishing cognitive strain in multimedia learning. They underscored the significance of skillfully crafted visual aids in augmenting educational outcomes. The cognitive load theory accentuates the finite mental resources available to learners, with visual representations serving as an efficient management tool for these resources. Additionally, socio-cultural theories underscore the influence of culture and personal experiences in shaping individuals' perception of visual stimuli (Tardrew, 2022). Özsoy and Saribaş (2021) recognize the imperative of nurturing visual literacy skills within the realm of teacher education while acknowledging the existence of diverse ways in which visual images are perceived. By embracing cultural diversity, individuals can gain a comprehensive understanding of different perspectives and interpretations within the realm of visual communication.

Furthermore, the correlation between visual literacy and media literacy is noteworthy, particularly in the digital era, where the ability to critically analyze and interpret visual representations in media is essential. Media literacy encompasses the skill of examining and evaluating media messages, and visual literacy is crucial in comprehending these messages within media-driven surroundings (Welsh & Wright, 2010). Educators are responsible for instilling the ability to discern and analyze visual media, as it is imperative to acknowledge the potential for manipulation and bias in visual representations.

These theories collectively contribute to a comprehensive grasp of the multifaceted nature of visual literacy and its applications in diverse educational and societal settings.

2.2 Visual Literacy in Comprehension and Communication

Visual understanding enhances comprehension and communication in a variety of educational settings. By incorporating visual elements into the learning process, students can better grasp intricate systems and abstract ideas (Bastani, 2016). In the realm of language acquisition, the integration of visual aids supports students' critical and visual literacy skills, especially in digital learning environments (Domínguez, Romero & Bobkina, 2021; Takaya, 2016). Visuals promote active learning by encouraging students to analyze, synthesize, and apply information. Complicated concepts can be effectively simplified and conveyed through visual representations, thereby rendering them more accessible and comprehensible to learners (Dondlinger, 2007). Educators can employ visuals to depict abstract concepts, showcase real-life instances, and deliver data in a captivating and immersive experience.

Additionally, visuals can decrease cognitive burden, enhancing the effectiveness and efficiency of the learning process (Mayer & Moreno, 2003). By integrating text with pertinent images, instructors can facilitate better information processing and retention among learners. Extensive research demonstrates that multimedia learning, incorporating visual aids, results in enhanced learning outcomes and long-term knowledge retention. Moreover, when teachers enhance their visual literacy through professional development, this significantly influences their pedagogical techniques and students' learning achievements (Eutsler, 2021; Kohnke, 2021). Equipped with visual literacy skills, educators can craft inventive and attractive instructional materials, leading to more impactful teaching practices and heightened student engagement.

Visual comprehension plays a vital role in the realm of internet-based educational settings. With the perpetual expansion of technological integration in learning, educators must modify their teaching methods to seamlessly provide information in digital forms (Rasheva et al., 2019). Enhancing their ability to comprehend visuals empowers teachers to build attractive and interactive digital study materials, thereby nurturing students' drive and enthusiasm for the subject matter (Esteban-Millat et al., 2018; Khan et al., 2023).

2.3 Benefits of Integrating Visual Literacy in Higher Education

The incorporation of visual literacy into higher education provides multiple advantages for both students and educators. By integrating visual elements, the overall learning experiences are elevated, rendering intricate subjects more approachable and relatable (Hmelo et al. 2009). Visual aids can dissect complex principles into significantly more easily understood fragments, giving students a more transparent comprehension of the material. Moreover, these visuals function as vital pathways for promoting active investigation, encouraging college students to delve more deeply into a subject (Odinokaya et al., 2023). As college students actively participate in their educational

process, their probability of retaining facts and using them in realistic situations will significantly increase.

Moreover, integrating visual literacy into better education improves students' crucial thinking and analytical capabilities. Visual representations commonly necessitate interpretation and analysis, allowing college students to interact in higher-order cognitive strategies (Sadik, 2009). They must dig more deeply into the contextual components, symbolism, and supposed messages underlying visual images, thereby more seriously assessing visual media in their environment (Farahat, 2012). By incorporating visual aids in instructional practices, educators can also cater to the various learning propensities of students. While specific individuals may grasp concepts more effectively through traditional reading and writing approaches, others prefer visual learning, comprehending ideas more readily when presented in images or diagrams (Mayer & Massa, 2003). By addressing these varying learning styles, educators can create inclusive environments that facilitate the success of all students.

Additionally, including visuals can strengthen the retention and retrieval of memories. As stated by Freeman and Burkholder (2019), the visual realm plays a critical role in the long-term recognition and retrieval of information. When students are exposed to visual depictions of concepts, there is an increased probability that they will retain and recall the information later. To this end, the development of visual literacy among faculty equips educators with the ability to generate novel instructional materials and embrace the integration of technology within their classrooms (Eutsler, 2021; Kohnke, 2021). Consequently, as technology progresses, instructors must adapt their teaching methodologies to incorporate the latest digital tools and visual media effectively. Refining their visual literacy expertise, empowers educators to create captivating and interactive lessons that deeply resonate with their students.

In addition, the incorporation of visual literacy in college and university curricula readies students for the requirements of the contemporary labor force. Visual communication is present in all sectors and occupations in this era of abundant information (Kędra & Žakevičiūtė, 2019). Individuals with a firm grasp of visual literacy will possess enhanced abilities to thrive in a society where information is commonly conveyed visually.

3. Current State of Visual Literacy in Higher Education

3.1 Overview of the Current Status of Visual Literacy Training for Higher Education Teachers

Visual literacy training for teachers has increased as institutions of higher education have recognized its importance in teaching and learning. (Tardrew, 2022). Visual media dominate communication and information dissemination today, making this skill essential. Visual literacy instruction is now part of teacher professional development at many universities. These programs teach teachers how to use visuals in their lessons. The goal is to help teachers create engaging and impactful learning experiences for students with varied learning styles.

Workshops, seminars, online courses, and programs teach visual literacy. Huilcapi-Collantes et al. (2020) found that a blended visual literacy course for in-service teachers improved instructors' knowledge and use of visual aspects. Eutsler (2021) also emphasizes the relevance of visual literacy in teacher preparation programs, where pre-service teachers learn how to use visual features to develop digital books for classroom integration. Visual literacy training encompasses interpreting visual texts and understanding and using visual features to promote learning objectives. Teachers analyze visual content for relevance and authenticity. They learn about visual learning's psychological and cognitive components, which helps them create compelling teaching materials.

Higher education institutions promote inclusive and dynamic learning by teaching visual literacy, assisting students in understanding complicated subjects, improving students' critical thinking, creativity, and visual communication abilities in the digital age. Visual literacy training has improved, but obstacles remain. It may take time to convince instructors to include visuals in their lessons (Welsh & Wright, 2010). Comprehensive visual literacy programs may also face resource and time constraints (Esteban-Millat et al., 2018). Visual literacy training for higher education professors is growing as institutions realize its value in boosting instruction and student learning. Higher education institutions may better serve diverse learners by teaching visual literacy and offering compelling, meaningful, and relevant learning experiences.

3.2 Challenges and Barriers to Integrating Visual Literacy in Higher Education

Although visual literacy is increasingly valued in higher education, various obstacles prevent its full incorporation into the curriculum. These barriers include educator attitudes, institutional limits, and assessment issues. To maximize visual literacy in higher education, these obstacles must be addressed. Some educators may resist because they do not understand its importance in learning. They may be accustomed to traditional teaching approaches and unaware of how visual literacy can improve student engagement and knowledge. Professional development and

training emphasizing visual components in teaching and learning can overcome this resistance (Huilcapi-Collantes et al., 2020). Visual literacy in higher education requires technology, money, and instruction. Universities often lack the resources and infrastructure to undertake comprehensive new programs. These institutions can seek external financing or work with others to solve this problem.

Visual literacy might be hindered by curriculum preparation time. Creating visually appealing materials and activities may overwhelm teachers. To save time, educators could use templates or tools to incorporate visual aspects into their lessons (Eutsler, 2021). Assessing students' visual literacy is another difficulty. Visual literacy is subjective and complicated, making standardized examinations challenging. Visual work evaluation and feedback may require training for educators. Rubrics and specific evaluation criteria help structure assessment (Zeyab, 2017).

Older educators may lack visual literacy training, not understanding its benefits. Institutions must provide continual professional development to improve visual literacy and understand industry trends and best practices. Visual literacy research in higher education can strengthen its integration. Institutions may overcome these barriers and fully embrace visual literacy in teaching and learning by educating, supporting, and resourcing educators. Creating a culture that values visual literacy and funding research on its efficacy can help integrate it into higher education.

4. Teacher Professional Development Programs for Visual Literacy

4.1 Overview of Existing Professional Development Programs for Visual Literacy

Giving teachers the resources that they need to navigate the mechanisms of visual learning is essential as the educational environment constantly evolves. The rise of visual media and the advent of the digital age have highlighted the significance of visual learning in the lecture hall. Subsequently, a wide range of specialized development programs have been advanced to equip teachers with the skills necessary to effectively use the power of visual communication. Academic investigation delves deeply into the fundamental "what," "why," and "how" components of visual literacy. Teachers can appreciate the reasoning for incorporating visual literacy into educational programs by first deconstructing its fundamental aspects. In addition, analysis reveals the underlying importance, arguing in favor of a more sophisticated comprehension of visual communication. This innovative viewpoint establishes the groundwork for future professional development programs and sheds light on the crucial part that visual literacy plays in developing learners who are both skilled and interested (Kędra & Žakevičiūtė, 2019).

In addition to this, Tardrew (2022) presents an original strategy for fostering educators' professional development via visual arts activities. Adding a creative and analytical thinking component to the educational improvement process via visual arts provides a new dimension to the overall growth equation. Tardrew's work demonstrates how interacting with graphic arts can spark the personal development of educators while at the same time cultivating the powers that are essential for successful teaching. The convergence of art and education is a fertile field for exploring creative methods of imparting information, enriching both educators and the students they teach (Tardrew, 2022).

4.2 Strategies of Effective Professional Development Programs for Visual Literacy

Hands-on Workshops: Teachers may effectively acquire practical skills by attending interactive seminars that promote participation and teamwork. These workshops might require participants to do visual analysis, multimedia project creation, and visual message interpretation. Through experiential learning, teachers get direct practice with visual literacy strategies (Rasheva-Yordanova & Planska-Simeonova, 2019).

Collaborative Learning Communities: Visual literacy instructors may exchange knowledge and best practices via communities of practice. In-person and online collaborative platforms enable lifelong learning. Teachers may share problems, resources, and creative visual element integration ideas.

Action Research Projects: Visual literacy action research initiatives foster reflective teaching. Teachers may study how visual information affects student learning, try new methods, and change procedures based on their research.

Incorporation of Real-world Examples: Examples and case studies aid in the contextualization of visual literacy. Educators can show the relevance and applicability of visual material from advertising, media, and art.

Visual literacy professional development programs must balance pedagogical foundations, technical competency, hands-on experiences, collaborative learning, action research, and real-world examples (Romero & Bobkina, 2021). These components and strategies help instructors navigate digital learning environments effectively, teach visual literacy skills to students, and shape a generation that understands and creates visual material in the digital age.

4.3 Successful Professional Development Initiatives in Visual Literacy

Effective visual literacy professional development programs have changed the school environment. Şentürk (2021) investigated the impact of a blended knowledge method on the academic success and 21st-century competencies of pre-service educators. Blended learning has become a powerful technique for improving visual literacy because it smoothly combines conventional classroom education with online learning environments.

Pre-service teachers were exposed to various visual materials and communication channels via in-person seminars and online resources (Şentürk, 2021). The outcomes demonstrated a significant increase in academic achievement and development of essential abilities, including critical thinking, creativity, and digital literacy. This example shows how carefully integrating digital materials into professional development may significantly increase its effect and equip educators to deal with the visual complexity of contemporary education.

5. Teaching Methods and Educational Technologies for Visual Literacy Instruction

5.1 Different Approaches and Methodologies for Teaching Visual Literacy

Based on research, there are various accessible and effective methods and strategies for instructing visual literacy. One teaching method is sketching, introduced by Gyuzel Gadelshina, Arrian Cornwell, and David Spoors (Kędra & Žakevičiūtė, 2019). This approach presents a unique way to examine a specific societal issue, such as bribery.

Kędra & Žakevičiūtė's article from 2019 proposed an activity that fosters reflective self-expression by analyzing a significant personal image. The educational-visual procedure's visual tasks and internet materials stimulated classroom discourse. They enabled the students to enhance their visual literacy skills, progressing from an individual interpretation of the picture to its cultural implications.

By following the four-stage procedure of observing, conceptualizing, producing, and expressing verbal-to-visual transmediation practices, it suggests that students acquire the ability to develop significance in their presentations and become adept at communicating this by utilizing both verbal and visual elements (Kędra & Žakevičiūtė, 2019). Given the demand for practical visual literacy skills in the developing job market, the article argues that all educational institutions should incorporate these multimodal composition techniques into their programs.

Zeyab and colleagues (2020) introduced a Visual Note Recording (VNR) approach to augment learning. Visual notes are illustrations that incorporate a deliberate fusion of words and images to communicate fundamental concepts from educators' presentations and student-peer conversations. Visual note recording aids in boosting visual literacy abilities and promoting visual cognition. Being visually literate and actively generating visuals, such as purposeful visual note recording or idea-sketching, lessens cognitive burden and enhances recollection of crucial information.

5.2 Integration of Educational Technologies in Visual Literacy Instruction

The use of educational technologies in teaching visual literacy has become essential. Media literacy and visual literacy have been linked to conventional teaching strategies. Welsh and Wright (2010) looked at the relationships between media and visual literacy to emphasize the importance of the digital age. Dominguez & Bobkina's (2021) research, which seeks to contribute to the growing body of literature on students' essential visual literacy needs in digital learning environments, also underscores this. It establishes a conceptual framework for enhancing observational and cognitive skills as vital elements of the digital media literacy competencies expected from students in the 21st century, utilizing established frameworks for traditional literacy skills.

The work of Zeyab (2017) explores the integration of educational technology in visual literacy instruction and the impact of utilizing doodling on student learning performance. This research offers innovative approaches to engage students and enhance their visual literacy skills through interactive and imaginative activities.

6. Attitudes of Higher Education Instructors Toward Visual Literacy

6.1 Factors Influencing Instructors' Attitudes Toward Visual Literacy

The personal experiences and educational backgrounds of instructors can drastically impact their attitudes toward visual literacy. Instructors who have been exposed to visual teaching techniques during their education are more likely to recognize visual literacy's benefits in enhancing comprehension and engagement (Hmelo et al., 2009). Such experiences can lead to a positive attitude towards incorporating visuals in their teaching practices. On the other hand, educators with limited exposure to visual literacy may be more hesitant or much less confident in utilizing visual factors in their lessons.

The level of institutional support for integrating visual elements into teaching can profoundly impact instructors' attitudes toward visual literacy. When institutions prioritize and encourage visual materials, instructors are more likely to identify visual literacy as a necessary aspect of effective pedagogy (Hobbs, 2007). Hence, support from the administration and access to resources, such as multimedia tools and technology, can additionally facilitate the adoption of visual literacy practices.

Promoting positive attitudes towards visual literacy among educators requires addressing challenges while capitalizing on possibilities to facilitate its effective integration.

One of the principal challenges in promoting positive attitudes toward visual literacy is the resistance to change among educators accustomed to traditional teaching methods (Welsh & Wright, 2010). Some instructors may also be hesitant to include visual factors due to concerns of disrupting their established teaching practices or believing that visuals are less effective than traditional approaches (Zeyab, 2017). Overcoming this resistance requires creating awareness about the advantages of visual literacy, supplying proof of its effectiveness, and demonstrating how visuals can complement existing teaching techniques.

6.2 Strategies to Overcome Resistance and Foster Positive Attitudes

Particular strategies can be employed to foster positive attitudes towards visual literacy. Professional improvement programs focusing on visual literacy training can equip educators with the knowledge and competencies to integrate visuals effectively into their teaching practices (Şentürk, 2021). Encouraging peer collaboration and sharing success stories of instructors who have efficiently integrated visual factors can motivate and inspire others to adopt similar practices. Additionally, providing incentives or recognition for instructors who actively incorporate visual literacy can reinforce positive attitudes and practices. Furthermore, creating a supportive environment that encourages experimentation and rewards creativity can assist in alleviating fears and uncertainties related to adopting visual literacy (Dondlinger, 2007). Educational institutions must also provide access to resources such as multimedia tools, educational technology, and visual content databases to facilitate the implementation of visual factors in teaching.

Integrating visual literacy into the curriculum is integral to its successful adoption. However, this process can be hindered by rigid curriculum structures and limited flexibility in content delivery. Therefore, to promote positive attitudes, educational institutions should create possibilities for educators to discover and utilize visual factors in their lesson plans despite overwhelming time constraints (Zeyab et al., 2020). This can be done through curriculum redesign, providing space for visual projects, and aligning visual literacy with learning objectives.

7. Student Engagement with Visual Materials and Visual Literacy Advancement

7.1 The Impact of Student Engagement on Visual Literacy Development

Student engagement with visual materials holds a primary role in the development of visual literacy. Visual engagement encompasses the active interaction with and thoughtful interpretation of a range of visual elements, such as images, diagrams, charts, and videos, in the learning process (Desimone, 2009). This engagement leads to multiple positive outcomes, including cognitive benefits, enhanced critical thinking, and improved knowledge retention.

Firstly, the cognitive advantages of visual engagement for learning are well-documented in educational research activities. Albion et al. (2015) note that when students interact with visual materials, their mental faculties are engaged through visual processing, activating various neural pathways. This heightened cognitive endeavor leads to improved information processing and comprehension. Visuals supply a concrete representation of abstract concepts, making complex information more accessible and less complicated to grasp. As a result, students can build mental connections between visual representations and academic content, facilitating better understanding and recall.

Secondly, visual engagement fosters the development of critical thinking and problem-solving competencies. Bastani (2016) observes that analyzing and interpreting visual content requires students to think critically, evaluate information, and draw conclusions. Visual evaluation entails identifying patterns, making inferences, and extracting key information. This process enhances students' potential to strategize challenges from different angles and consider various perspectives. Such analytical abilities are transferable to different academic subjects and real-world scenarios, empowering students to become more independent and adaptable learners.

Additionally, visual materials serve as effective tools for knowledge retention. The "picture superiority effect" suggests that facts presented in visual form are better retained in memory compared to textual information alone (Domínguez Romero & Bobkina, 2021). Hence the old saying: A picture is worth a thousand words. When students interact with visuals, they create mental images that aid in memory encoding and retrieval. Visuals additionally

enhance the encoding process by providing contextual cues, making it less complicated for students to recall information later (Kohnke, 2021). Thus, by integrating visual factors into their studying experiences, students can enhance long-term retention of tutorial content, leading to more robust learning outcomes. In conclusion, student engagement with visual materials substantially impacts visual literacy development.

7.2 Strategies for Promoting Student Engagement with Visual Materials

Promoting student engagement with visual materials is essential for fostering visual literacy and creating a dynamic learning experience. To achieve this, educators can employ various strategies that cater to diverse learning styles and interests, encouraging students to fully interact with visual content.

Integrating multimedia and interactive elements in lessons can significantly enhance student engagement. Educational videos, animations, simulations, and interactive presentations can bring abstract concepts to life, making learning more enjoyable and relatable. Multimedia elements appeal to different senses, stimulating visual and auditory learners and those who prefer hands-on experiences (Arslan & Nalinci, 2014). Hence, educators create a dynamic and immersive learning environment by incorporating technology and interactive tools, empowering students to explore and interact with the content.

Engaging students in meaningful discussions about visuals encourages critical thinking and communication skills. Teachers can ask thought-provoking questions, prompt students to analyze visual content, and encourage them to share their interpretations and insights (Lehmuskallio, 2019). Collaborative activities such as group projects involving visual presentations or data analysis promote teamwork and peer learning. Hence, by encouraging students to actively participate in the learning process, educators facilitate deeper engagement and help students make meaningful connections with the subject matter.

Enabling students to express themselves creatively through visuals is an effective way to enhance engagement. Visual arts, such as graphic design, furnish students with outlets to creatively demonstrate their understanding of academic concepts (Tardrew, 2022). Teachers can incorporate visual arts initiatives into the curriculum, permitting students to create posters, infographics, or multimedia presentations that reflect their comprehension of the material. This strategy enhances visual literacy and fosters a sense of possession and pride in their' work, boosting their motivation and self-esteem (Takaya, 2016). In conclusion, promoting student engagement with visual materials entails incorporating multimedia and interactive factors to create immersive learning experiences.

7.3 The Relationship Between Student Engagement and Visual Literacy Advancement

The relationship between student engagement and visual literacy development is dynamic and mutually reinforcing, with active engagement as a catalyst for visual literacy development and subsequent academic success.

Firstly, a robust correlation exists between active engagement with visual materials and visual literacy competence (Schwartz, 2018). Students develop essential visual literacy competencies when actively engaging with visual content, such as assessing images, deciphering infographics, and interpreting diagrams. Active engagement entails critical thinking, problem-solving, and connecting visual facts and tutorial concepts. As students repeatedly engage with visuals, they emerge as more proficient in visual interpretation and communication, which leads to enhanced visual literacy competence.

Secondly, sustained visual engagement has long-term effects on academic performance (Sadik, 2009). Continuous exposure to visual materials throughout students' educational journeys nurtures and refines their visual literacy skills over time. As visual literacy improves, students become better equipped to access, understand, and apply visual information across different academic subjects. Visuals are ubiquitous in educational materials, and the ability to navigate and comprehend visual content effectively translates into better academic outcomes in various disciplines.

Thirdly, promoting self-directed learning through visual exploration improves visual literacy (Özsoy & Saribas, 2021). When students engage in independent visual exploration, seeking out educational videos, infographics, and multimedia resources on topics of interest, they take ownership of their learning process (Rasheva-Yordanova & Planska-Simeonova, 2019). This self-directed learning approach fosters curiosity, autonomy, and a sense of agency in students' education. As they explore visual materials independently, students develop a deeper appreciation for the value of visual literacy in acquiring knowledge and understanding complex concepts.

In conclusion, the relationship between student engagement and visual literacy advancement is characterized by mutual reinforcement and long-term benefits.

8. Methodology

8.1 Participants

The demographic details of the participants in the study reveal a comprehensive understanding of their backgrounds, positions, experience, qualifications, and recent training endeavors. In terms of gender distribution, out of the total participants, 37.7% (46 participants) were male while a significant majority, 62.3% (76 participants), were female. When participants were asked about their current position at their respective institutions, 30.3% (37 participants) identified as Lecturers, followed by 38.5% (47 participants) who held the position of Assistant Professor. Associate Professors constituted 19.7% (24 participants) of the total; the smallest group in this category was Professors, comprising 11.5% (14 participants).

Regarding teaching experience, participants varied widely in their duration in the educational field. Those with less than 5 years of experience constituted 17.2% (21 participants). A slightly larger group, 27% (33 participants), had experience ranging from 5 to 10 years. Participants with 11 to 20 years of teaching experience made up 23.8% (29 participants) of the total; those with 21 to 30 years of experience also accounted for 19.7% (24 participants). The veterans in the group, with more than 30 years of teaching experience, formed 12.3% (15 participants) of the sample. In the context of the highest educational qualifications, the vast majority, 87.7% (107 participants), held a doctoral degree such as a PhD or EdD. A much smaller fraction, 4.9% (6 participants), had attained a master's degree, while 7.4% (9 participants) had pursued post-doctoral studies. Lastly, when questioned about their exposure to visual literacy training programs in the last two years, 23.8% (29 participants) had attended such a program. In contrast, a sizable majority, 76.2% (93 participants), reported that they had not undergone any training program on visual literacy during this period.

Table 1. Demographic Details of the Participants

		Frequency	Percentage
Gender	Male	46	37.7%
	Female	76	62.3%
What is your current position?	Lecturer	37	30.3%
	Assistant Professor	47	38.5%
	Associate Professor	24	19.7%
	Professor	14	11.5%
What is your teaching experience?	Less than 5 years	21	17.2%
	5-10 years	33	27.0%
	11-20 years	29	23.8%
	21-30 years	24	19.7%
	More than 30 years	15	12.3%
What is your highest qualification?	Masters	6	4.9%
	Doctoral degree	107	87.7%
	Post-doc	9	7.4%
Have you attended any training program on visual literacy in the last two years?	Yes	29	23.8%
	No	93	76.2%

8.2 Research Instrument and Study Variables

The dependent variable of this study is visual literacy development, while the independent variables include teachers' professional development training programs which were measured following these constructs: prospective teachers' engagement, teachers' attitudes, use of technology, and teaching methods.

8.2.1 Dependent Variable

Visual Literacy Development. This variable represents the level of visual literacy skills and competencies attained by prospective teachers as a result of their participation in professional development training programs. It can be assessed through measures such as performance on visual literacy tasks, self-assessment of visual literacy skills, or self-reported questionnaires.

8.2.2 Independent Variables

Teachers' Professional Development Training Programs. This variable represents the different types of training programs, workshops, or courses that are provided to prospective teachers to enhance their visual literacy competencies.

Knowledge of Visual Literacy. This variable refers to the prospective teachers' understanding and knowledge of visual literacy concepts, theories, and principles. It can be assessed through tests or surveys that measure their knowledge of visual literacy frameworks, terminology, and instructional strategies. I found one questionnaire that can measure participants' efficacy in visual literacy.

Teaching Methods (Integration of Visual Elements in Teaching). This variable measures the extent to which prospective teachers incorporate visual elements (e.g. images, videos, diagrams) in their instructional practices. It can be assessed through observation of classroom instruction, analysis of lesson plans, or self-reported measures.

Perceptions of Visual Literacy Importance and Efficacy. This variable captures the attitudes, beliefs, and perceptions of prospective teachers regarding the importance and effectiveness of visual literacy in education.

8.3 Reliability Analysis of Instrument

The reliability of the scales used in this study was determined using Cronbach's alpha coefficients. For "Visual Literacy Development," a coefficient of 0.82 was obtained, highlighting its strong internal consistency. In a similar vein, "Integration of Visual Elements in Teaching" and "Perceptions of Visual Literacy Importance and Efficacy" both demonstrated robust internal consistencies with coefficients of 0.886 and 0.824, respectively. This signifies that the items in these scales reliably gauge their intended constructs.

8.4 Data Analysis Techniques

The data analysis techniques used in this study were tailored to address the research questions and ensure rigorous statistical analysis of the data. Descriptive statistics were used to examine the distribution of visual literacy scores between the two groups. Additionally, inferential statistical tests, such as t-tests or analysis of variance (ANOVA), were employed to determine if there are statistically significant differences in visual literacy scores between the groups. Regression analysis was utilized to explore the effect of independent variables on visual literacy development. All data analyses were carried out in the SPSS v.26.

9. Results and Data Analysis

This section offers an in-depth examination of the collected data. The core objective of this research was to delve into the impact and relevance of professional development for educators in higher education in the context of visual literacy enhancement. Through a combination of descriptive and inferential statistical methods, the data shed light on the present status of visual literacy progression, the efficacy of different professional development initiatives, and the viewpoints and beliefs of higher education practitioners regarding visual literacy.

9.1 Descriptive Statistics of Study Variables

The descriptive statistics pertaining to the study's variables offer a comprehensive understanding of the sample's primary attributes and their dispersion. Average scores were derived from aggregating all individual item responses on the respective scales. The computed mean scores across the variables underscore a high degree of competence, cognizance, and favorable views regarding diverse facets of visual literacy and its pedagogical significance. As per Table 2, the "Visual Literacy Development" variable registers a mean of 4.39 and a standard deviation of 0.58, highlighting that a significant portion of the participants demonstrate commendable visual literacy proficiencies. The "Teachers' Professional Development Training Programs" records a mean of 4.45 and a standard deviation of 0.40, reflecting a uniformly affirmative sentiment about the utility and merit of such initiatives. Meanwhile, the "Knowledge of Visual Literacy" variable, with its mean of 4.29 and a standard deviation of 0.48, underscores the prevalent grasp and familiarity with visual literacy principles among the respondents. For "Integration of Visual Elements in Teaching", the mean score stands at 4.43, with a standard deviation of 0.59, suggesting strong

incorporation of visual elements in instructional practices. Lastly, "Perceptions of Visual Literacy Importance and Efficacy" records an average score of 4.32 and a standard deviation of 0.65.

Table 2. Descriptive Statistics of Study Variables

Study Variables	Mean	Std. Deviation	Skewness	Kurtosis
Visual Literacy Development	4.39	0.58	-1.67	4.95
Teachers' Professional Development Training Programs	4.45	0.40	-0.64	-0.22
Knowledge of Visual Literacy	4.29	0.48	-0.90	0.92
Integration of Visual Elements in Teaching	4.43	0.59	-1.60	3.98
Perceptions of Visual Literacy Importance and Efficacy	4.32	0.65	-1.33	1.58

9.2 Correlation Analysis

The correlation matrix offers valuable insights into the nature and strength of the relationships among study variables. Notably, all the reported correlations are statistically significant at the 0.01 level, confirming the reliability of the relationships presented (see Table 3). The variable Visual Literacy shares a notably strong positive relationship with Professional Development, as suggested by a correlation coefficient of .75. This indicates that as teachers undergo more professional development training, there is a corresponding increase in visual literacy skills. Furthermore, Visual Literacy also demonstrates a moderate positive relationship with Perceptions of Visual Literacy Importance and Efficacy, as indicated by a coefficient of .52. In summary, the matrix paints a picture of interrelated constructs where professional development, knowledge enhancement, integration of visual elements, and positive perceptions collaboratively play significant roles in advancing visual literacy in the educational realm.

Table 3. Correlation Matrix of Study Variables

	Visual Literacy Development	Teachers' Professional Development Training Programs	Knowledge of Visual Literacy	Integration of Visual Elements in Teaching	Perceptions of Visual Literacy Importance and Efficacy
Visual Literacy Development	1				
Teachers' Professional Development Training Programs	.749**	1			
Knowledge of Visual Literacy	.458**	.322**	1		
Integration of Visual Elements in Teaching	.612**	.521**	.336**	1	
Perceptions of Visual Literacy Importance and Efficacy	.515**	.474**	.593**	.649**	1

9.3 Effect of Various Factors on Visual Literacy Development

A multiple regression analysis was performed to assess the effect of professional development training, knowledge of visual literacy, integration of visual elements in teaching, and perception of visual literacy on visual literacy development. The model summary provides an overview of the overall fit of the regression model. The R^2 value, or coefficient of determination, is .663. This suggests that approximately 66.3% of the variance in visual literacy development can be explained by the predictor variables included in the model.

The ANOVA table tests the hypothesis that the regression model predicts the dependent variable (Visual Literacy Development) based on four predictors, $F(4, 117) = 57.44$, $p<.001$. The overall ability to predict visual literacy is

statistically significant and suggests that at least one of the predictor variables is useful in predicting the outcome variable. The coefficients table provides detailed insights into the contribution of each predictor. Professional Development has a positive unstandardized coefficient (B) of .796, suggesting that for every one-unit increase in Professional Development, there is an associated increase of .796 units in Visual Literacy Development, keeping all other predictors constant. This relationship is statistically significant with a t-value of 8.650 and a p-value less than .001. Knowledge of Visual Literacy also has a positive relationship with Visual Literacy, with a coefficient of .269. Lastly, Perceptions of Visual Literacy Importance and Efficacy have a negative coefficient of -.063, but it is noteworthy that this predictor is not statistically significant (p = .397). This implies that Perceptions of Visual Literacy, as a predictor, do not have a meaningful impact on Visual Literacy Development in this model.

Table 4. Model Summary of Multiple Regression Analysis

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.814[a]	.663	.651	.34035

a. Predictors: (Constant), PerceptionVL, ProfessionalDevelopment, KnowledgeVL, IntegrationVT

Table 5. Regression's ANOVA Result

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	26.613	4	6.653	57.436	.000[b]
	Residual	13.553	117	.116		
	Total	40.165	121			

a. Dependent Variable: Visual Literacy

b. Predictors: (Constant), Perception VL, Professional Development, Knowledge VL, Integration VL

Table 6. Coefficients from Multiple Regression Analysis

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.279	.394		-3.246	.002
	Professional Development	.796	.092	.559	8.650	.000
	KnowledgeVL	.269	.081	.222	3.301	.001
	IntegrationVT	.283	.073	.293	3.908	.000
	PerceptionVL	-.063	.074	-.071	-.850	.397

a. Dependent Variable: VisualLiteracy

9.4 Mean Difference between Male and Female Teachers

An independent t-test was performed to determine the significant difference in the study variables between male and female participants. Results found that there is no significant difference between male and female participants. The mean values for male and female participants are visually presented in the following Figure. For Visual Literacy, the male participants (N=46) reported a mean score of 4.35 while the female participants (N=76) reported a slightly higher mean score of 4.42. However, the difference in mean values between the two groups is minimal. In terms of Professional Development, the mean values for both genders are quite close, indicating a negligible difference in

their responses. For the variable Knowledge of Visual Literacy, males registered a mean value of 4.25 and females' mean value of 4.32. Lastly, for Perceptions of Visual Literacy Importance and Efficacy, male participants presented a mean score of 4.31 and females had a closely aligned mean score of 4.32.
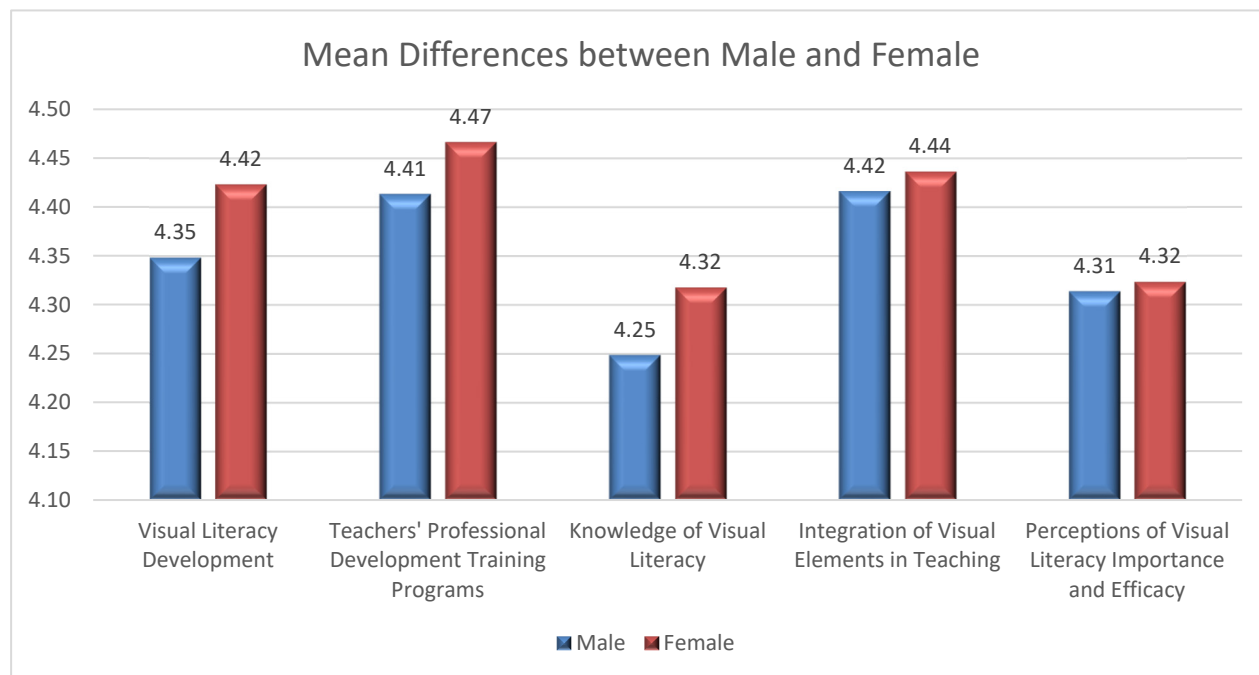

Figure 1. Mean Difference between Male and Female Participants

10. Discussion of Findings

There was a total of 122 university teachers participating in this study. A vast majority of the participants held doctoral degrees, showing a highly educated cohort. However, a noteworthy observation is the substantial proportion of educators who have not recently undergone any training program on visual literacy. This stresses the unmet need and potential avenues for more tailored training initiatives in the future. The multiple regression analysis further highlighted the predictive power of some of these variables. While Professional Development emerged as a robust predictor of Visual Literacy, interestingly, Perceptions of Visual Literacy Importance and Efficacy did not significantly contribute to the model. This could suggest that while recognizing the importance of visual literacy is valuable, it is the practical training and knowledge dissemination that predominantly molds the faculty's proficiency in this realm. The t-test comparison between male and female participants did not yield any significant gender-based differences. Both genders appear to have similar views and proficiencies concerning visual literacy, suggesting a uniform emphasis on this domain, irrespective of gender.

10.1 Research Questions and Their Answers

RQ #1: How does participation in teachers' professional development training programs at the higher education level influence the visual literacy development of university teachers?

Based on the multiple regression analysis, there was a strong positive association between teachers' professional development training programs and visual literacy development. With a beta coefficient of 0.559, it is evident that participation in these training programs contributes significantly to the enhancement of visual literacy among university faculty members. The statistical significance of this association, marked by a p-value less than 0.001, further underscores the relevance of professional training programs in the growth of visual literacy. This indicates that professional development is a key factor in improving the visual literacy capacities of prospective teachers in higher education.

RQ #2: What are the effects of teachers' professional development training programs on the integration of visual elements in the instructional practices of university teachers?

The correlation matrix presented earlier provides insights into this question. There is a significant positive correlation between professional development and the integration of visual elements in teaching (r = .521, p < .01). This suggests that as prospective teachers partake in professional development training programs, they are more likely to effectively integrate visual elements into their instructional practices. The more these educators are exposed to training, the better equipped they appear to be at weaving visual components seamlessly into their pedagogical methods.

RQ #3: To what extent do teachers' professional development training programs enhance the knowledge of visual literacy?

The correlation analysis also indicates a significant but moderate positive relationship between professional development and knowledge of visual literacy (r = .322, p < .01). This suggests that while participation in professional development training programs has a positive impact, other factors not captured in this study might also play an essential role in shaping the knowledge of visual literacy. Nonetheless, the observed relationship emphasizes the importance of continuous professional learning in fortifying the visual literacy knowledge base among university faculty members.

10.2 Implications

The implications of these findings are manifold. Firstly, institutions need to recognize the quintessential role of professional development programs in bolstering visual literacy. As the academic landscape becomes more digitized and visually oriented, preparing faculty through these programs can significantly enhance the quality of education. Furthermore, the gender-neutral perspective on visual literacy emphasizes its universal importance, calling for standardized initiatives that cater to all faculty members.

10.3 Limitations

Like all studies, this investigation has its limitations. The study primarily depended on self-reported data, which can sometimes introduce bias. The participant pool, though diverse in roles, majorly consisted of doctoral degree holders, which might not represent the broader spectrum of academia. The absence of significant gender differences might be due to the uniformity of the academic environment, so these results might differ in other settings or cultures.

10.4 Direction for Future Studies

Future research should consider expanding the participant pool to include faculty from diverse educational backgrounds and different institutional types. Cross-cultural studies can elucidate any cultural nuances in perceptions and proficiencies related to visual literacy. Exploring the actual impact of visual literacy on student outcomes can provide more concrete evidence of its importance. Additionally, longitudinal studies tracking the evolution of visual literacy competencies post-training can offer deeper insights into the lasting impact of professional development programs.

11. Conclusion

In conclusion, the findings of this research underscore the critical role of professional development in shaping the visual literacy skills and practices of prospective teachers in higher education. Such training not only equips educators with this knowledge, but also promotes the effective integration of visual elements into their teaching, benefiting students in their visual comprehension and interpretation skills. Future studies could delve more deeply into the nuances of these training programs to identify which specific components or methodologies yield the most significant outcomes in terms of visual literacy enhancement. Finally, visual literacy stands as a cornerstone in contemporary academia. Through focused efforts, continuous research, and tailored interventions, it holds the potential to revolutionize the educational paradigm.

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