THE ROLE OF DIGITAL LITERACY IN DISTANCE EDUCATION: A GENDER BASED ANALYSIS OF LEARNING AT ISLAMIC (MADRASAH) SCHOOL IN PAKISTAN

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Abstract

This paper explores the role of digital literacy in distance education, focusing on gender-based differences in learning outcomes and engagement at the Islamic (madrasah) school level in District Taunsa Sharif, South Pakistan. With the rapid shift towards digital platforms for education, understanding how digital literacy impacts male and female students differently has become crucial. The study employs a quantitative research methodology, including in questionnaire with teachers and students from various Islamic (madrasah schools in the region. The first objective is to analyze the impact of digital literacy on learning outcomes among male and female students in distance education. The findings reveal that students with higher levels of digital literacy tend to perform better academically, but significant gender disparities exist. Male students often have greater access to digital tools and resources, contributing to better learning outcomes compared to their female counterparts, who face cultural and societal constraints.The second objective is to evaluate engagement levels based on gender using digital literacy tools. The study finds that while digital literacy enhances student engagement, female students often exhibit lower levels of participation due to limited access to technology and societal expectations. However, when provided with equal opportunities and resources, female students show comparable levels of engagement to male students, underscoring the importance of addressing gender inequalities in digital access. There were 996 secondary teachers in all, all of them were Islamic (madrasah school teachers from the district of Taunsa Sharif. A questionnaire was used to gather the quantitative data. The acquired data was analyzed by dividing the demographics of the respondents into percentages. Expert opinion and the Cronbach Alpha score were used to verify the questionnaire's validity and reliability during the test's pilot phase in Taunsa Sharif district.

Keywords: Digital Literacy, Distance Education, Learning Outcomes, Islamic (madrasah School Students, Educational Technology

Introduction:

The advent of digital technologies has profoundly transformed the educational landscape, especially in the context of distance education. Digital literacy, defined as the ability to effectively find, evaluate, utilize, share, and create content using digital technologies, is now a crucial skill for both educators and learners. [1] In developing countries like Pakistan, where access to quality education has been historically uneven,

[1] Bawden, Origins and concepts of digital literacy. In Digital Literacies: Concepts, Policies and Practices (pp. 17-32). Peter Lang.

digital literacy offers new opportunities to bridge educational gaps, particularly through distance learning programs.[2]

In the district of Taunsa Sharif, South Pakistan, where traditional classroom setups are often hindered by socio-economic challenges, distance education has emerged as a viable alternative. However, the effectiveness of distance education largely depends on the digital literacy of students, which can significantly impact learning outcomes and engagement. Research has shown that digital literacy not only enhances students' ability to access and comprehend educational content but also improves their ability to engage with peers and educators in virtual learning environments.[3]

Gender disparities in education are a critical issue in Pakistan, particularly in rural areas. These disparities are often exacerbated in digital education environments where boys and girls may have differing levels of access to digital tools and varying degrees of familiarity with digital platforms.[4] Understanding how digital literacy affects learning outcomes and engagement across genders in distance education is essential for developing strategies that ensure equitable access to education for all students.

Objectives of the Study:

- To analyze the impact of Digital literacy on learning outcomes in distance education among male and female students in Islamic (madrasah school of taunsa sharif.
- To evaluate the engagement based on gender using digital literacy tools, also Impact of Digital Literacy in Distance Education comparatively analysis based gender.

Statement of the problem:

The problem this study addresses is the gender-based disparities in digital literacy and its impact on learning outcomes and engagement in distance education among Islamic (madrasah) school students in District Taunsa Sharif, South Pakistan. As digital tools become integral to education, the gap in digital literacy between male and female students threatens to widen existing educational inequalities. This research seeks to explore these disparities and provide insights to ensure that digital education is accessible and beneficial to all students, regardless of gender.

Significant of the Study

The significance of this study lies in its potential to illuminate the gender-based disparities in digital literacy and their impact on learning outcomes and engagement in distance education at the Islamic (madrasah school level in District Taunsa Sharif, South Pakistan. By identifying the challenges and barriers faced by male and female students, the research aims to provide valuable insights for educators and policymakers. These insights can help in designing more inclusive and equitable digital education strategies, ensuring that all students, regardless of gender, have the opportunity to succeed in a rapidly digitizing educational landscape.

[2] Ameen, Issues of digital literacy: A study of university students and research scholars. Pakistan Journal of Information Management & Libraries, 15(1), 1-15.

[3] Mishra et al., Online teaching-learning in higher education during lockdown period of COVID-19 pandemic. International Journal of Educational Research Open, 1, 100012.

[4] Shah, Gender inequality in education in Pakistan: The role of digital literacy. International Journal of Educational Development, 49, 167-176.

Purpose of the Study

The purpose of this study is to investigate the role of digital literacy in shaping learning outcomes and student engagement in distance education, with a focus on gender-based differences among Islamic (madrasah school students in District Taunsa Sharif, South Pakistan. The study aims to analyze how digital literacy influences academic performance and participation levels, and to identify any existing gender disparities. By doing so, the research seeks to contribute to the development of more equitable educational practices that support both male and female students in the digital age.

Literature Review

Digital literacy in Islamic Madras's Distance Education

Digital literacy plays a crucial role in enhancing the learning experiences of students in Islamic Madrasah setting, particularly in distance education. Studies show that effective digital literacy programs contribute to improved academic performance and engagement among students, allowing them to navigate online resources more effectively.[5] However, gender disparities persist, with female students often experiencing greater challenges in accessing and utilizing digital technologies.[6] Addressing these inequalities through tailored digital literacy initiative can significantly enhance the educational outcomes for girls in Islamic educational context.[7]

Digital literacy is increasingly recognized as an essential in enhancing educational outcomes in distance education, particularly Islamic Madrasah settings. Research indicates the digital literacy skills can significantly improve student's engagement and learning outcomes, fostering a more interactive and effective learning environment.[8] Gender disparities in digital literacy access and usage further influence educational equity, with studies showing that girls often face more barriers compared to boys in utilizing digital tools.[9] This highlights the need for targeted interventions to enhance digital literacy among female students in Islamic educational institutions.[10]

Digital Literacy and Educational Outcomes

Digital literacy has become a critical component in modern education, influencing both learning outcomes and engagement. According to [11], digital literacy encompasses not only technical skills but also the ability to critically engage with digital content. Effective digital literacy skills are associated with improved academic performance as students can access, evaluate, and utilize information more efficiently. Studies such as

[5] Alharbi, Enhancing digital literacy in higher education: Implications for distance learning. Journal of Educational Technology Systems, 48(1), 25-40.

[6] Saeed, Gender differences in digital literacy among students in Pakistan: A case study. International Journal of Information and Education Technology, 9(5), 352-358.

[7] Mansoor, Bridging the gender gap in digital literacy: Strategies for Islamic Madrasahs. International Journal of Inclusive Education, 25(7), 765-780.

[8] Alhassan, The role of digital literacy in distance education: Implications for teaching and learning. International Journal of Educational Technology, 12(3), 123-134.

[9] Zubair, Gender disparities in digital literacy: The case of Pakistani schools. Journal of Education and Practice, 9(24), 45-52.

[10] Khan, Bridging the digital divide: Strategies for enhancing digital literacy among girls in Islamic Madrasahs. Asian Journal of Education and Social Studies, 21(1), 10-20.

[11] Warschauer, Technology and social inclusion: Rethinking the digital divide. MIT Press.

those by [12], highlight that students who are proficient in digital literacy are better equipped to manage and apply information in various educational contexts.

Gender Disparities in Digital Literacy

Research indicates that gender disparities in digital literacy are prevalent and can impact educational outcomes. [13]points out that boys often have more access to technology and are more likely to engage with digital tools, which can lead to better learning outcomes. Conversely, female students may face socio-cultural barriers that limit their access to and use of technology. [14]further argues that these disparities can influence students' confidence and performance in digital environments, exacerbating existing educational inequalities.

Impact of Digital Literacy on Engagement

Engagement in distance education is significantly influenced by students' digital literacy. Studies have shown that students with higher digital literacy levels are more engaged in online learning environments. According to a study by [15], digital literacy facilitates better interaction with digital learning tools and resources, leading to increased student engagement and motivation. However, this engagement is often gendered, with female students sometimes experiencing lower levels of engagement due to fewer opportunities or different usage patterns.

Gender-Based Differences in Distance Education

Gender-based differences in distance education outcomes have been widely studied. The findings suggest that while digital literacy can enhance learning, the benefits are not evenly distributed. For instance, a study by [16], found that female students often encounter additional barriers in digital learning environments, such as limited access to technology and lower self-efficacy. Addressing these barriers is crucial for ensuring that distance education is equally effective for both genders.

Contextual Factors in South Pakistan

In the context of South Pakistan, socio-economic and cultural factors significantly impact digital literacy and educational outcomes. Research by [17] indicates that students in this region face unique challenges, such as limited access to technology and gender-based restrictions, which affect their ability to engage with digital learning tools. Understanding these contextual factors is essential for developing targeted interventions that address local needs and promote equitable educational opportunities.

Digital Divide and Educational Inequality

The concept of the digital divide has long been a concern in the discourse on educational inequality. The digital divide refers to the gap between those who have access to digital technologies and those who do not, which often aligns with socio-

[12] Leu, the new literacies of online reading comprehension: Expanding the literacy curriculum. Handbook of research on literacy and diversity, 155-176.
[13] Selwyn, Digital education: A critical introduction. Routledge.
[14] Buckingham, beyond technology: Children's learning in the age of digital culture. Polity Press.
[15] Chen, The role of digital literacy in distance education: A review of research. Journal of Educational Technology & Society, 13(4), 146-159.
[16] Margolis, The anatomy of intrigue: Gender and digital literacy. MIT Press.
[17] Khan, Educational technology and gender disparities in South Pakistan. International Journal of Educational Research, 89, 35-44

economic, geographical, and gender lines. According to [18], this divide extends beyond mere access to technology and encompasses disparities in digital skills and usage patterns. In educational settings, students with limited access to digital tools and low digital literacy are at a disadvantage, which can exacerbate existing educational inequalities. This divide is particularly pronounced in rural areas like District Taunsa Sharif, where infrastructural challenges and socio-cultural norms can limit access to digital resources, especially for female students.

Digital Literacy as a Driver of Educational Innovation

Digital literacy is increasingly recognized as a key driver of educational innovation, transforming how knowledge is delivered, consumed, and assessed. Educational theorists like [19]argue that digital literacy goes beyond the ability to use technology; it involves understanding how to learn and communicate in digital environments. This broader perspective on digital literacy suggests that it is integral to fostering critical thinking, creativity, and collaboration among students. In the context of distance education, digital literacy enables students to engage with diverse learning materials, participate in online discussions, and collaborate on projects, all of which contribute to improved learning outcomes.

Impact of Digital Literacy on Academic Achievement

Several studies have demonstrated a positive correlation between digital literacy and academic achievement. For instance, the research by [20]highlights that students who are more digitally literate tend to perform better academically, as they can more effectively search for information, analyze data, and present their findings. Moreover, digital literacy equips students with the skills needed to navigate complex information environments, which is increasingly important in both traditional and distance learning contexts. However, this positive impact is contingent upon students having equitable access to digital tools and the necessary support to develop their digital skills.

Gender and Access to Digital Learning Tools

Gender disparities in access to digital learning tools are well-documented and have significant implications for educational outcomes. According to[21], female students often face systemic barriers that limit their access to technology, such as lower socio-economic status, gendered expectations, and less encouragement to engage with technology from an early age. These barriers can result in lower digital literacy levels among female students, which in turn affects their participation and success in digital learning environments. Addressing these disparities is crucial for ensuring that digital education initiatives do not inadvertently reinforce gender inequalities.

Cultural Factors Influencing Digital Literacy

Cultural factors play a significant role in shaping digital literacy and educational engagement, particularly in conservative and rural contexts like District Taunsa Sharif. Research by [22]indicates that cultural norms around gender roles can restrict girls' and

[18] van Dijk, The deepening divide: Inequality in the information society. SAGE Publications.
[19] Gee, what video games have to teach us about learning and literacy. Palgrave Macmillan.
[20] Livingstone, Gradations in digital inclusion: Children, young people, and the digital divide. New Media & Society, 9(4), 671-696.
[21] Cooper, Gender and computers: Understanding the digital divide. Lawrence Erlbaum Associates.
[22] Hafkin, Cinderella or cyberella? Empowering women in the knowledge society. Kumarian Press.

women's access to education and technology, further widening the digital divide. In many South Asian contexts, including parts of Pakistan, there is a prevalent belief that digital technology is more suitable for males, which can discourage female students from pursuing digital literacy. This cultural bias not only limits their educational opportunities but also affects their confidence and motivation to engage in digital learning environments.

Educational Policies and Digital Literacy Initiatives

Educational policies and initiatives aimed at enhancing digital literacy are critical in bridging the digital divide and promoting equitable educational outcomes. [23] emphasizes the need for targeted interventions that focus on marginalized groups, including girls and women in rural areas, to ensure they have the skills and resources necessary to succeed in digital learning environments. These policies often include providing access to digital tools, training for teachers on how to integrate technology into the curriculum, and initiatives to raise awareness about the importance of digital literacy. However, the effectiveness of these policies is often limited by the socio-cultural context in which they are implemented, requiring localized approaches that address specific barriers faced by different groups.

Teacher Training and Support for Digital Literacy

Teacher training is a crucial component of successful digital literacy programs. As [24] note, teachers play a key role in facilitating students' digital literacy, but they themselves often require significant support to effectively integrate technology into their teaching practices. In contexts like District Taunsa Sharif, where access to professional development opportunities may be limited, teachers may struggle to keep up with the demands of digital education. Providing targeted training and ongoing support for teachers is essential to ensure that they can confidently use digital tools and foster digital literacy among their students.

Challenges in Implementing Digital Literacy in Rural Areas

Implementing digital literacy programs in rural areas presents unique challenges. According to [25], these challenges include limited infrastructure, such as unreliable electricity and internet connectivity, as well as socio-economic barriers that prevent students from accessing digital tools. In regions like District Taunsa Sharif, these challenges are compounded by cultural attitudes towards technology and education, particularly for girls. Addressing these challenges requires comprehensive strategies that combine infrastructure development with community engagement and education, ensuring that digital literacy programs are sustainable and culturally sensitive.

Methodology

Research Design

This study employed a quantitative research design to investigate the impact of digital literacy on learning outcomes and engagement in distance education, with a focus

[23] UNESCO, Digital literacy in education: Policy brief. Retrieved from [UNESCO](https://unesdoc.unesco.org/ark:/48223/pf0000214753)

[24] Ertmer, Teacher technology change: How knowledge, confidence, beliefs, and culture intersect. Journal of Research on Technology in Education, 42(3), 255-284.

[25] Trucano, Knowledge maps: ICTs in education. infoDev/World Bank.
Warschauer, M. (2003).

on gender-based differences among Islamic (madrasah school students in District Taunsa Sharif, South Pakistan. The design was based on a cross-sectional survey method, which effectively captured data from a large population at a single point in time, enabling the identification of patterns and relationships between digital literacy, gender, and educational outcomes.

Population and Sample

The target population consisted of Islamic (madrasah school students enrolled in distance education programs within District Taunsa Sharif. To facilitate a gender-based analysis, the sample included an equal representation of male and female students. A stratified random sampling technique was employed to ensure that various subgroups (e.g., gender, socio-economic status) were adequately represented. The final sample size comprised 300 students, with 150 males and 150 female participants.

Data Collection Instrument

Data were collected using a structured questionnaire specifically designed for this study. The questionnaire was divided into the following sections:

Demographics: This section gathered information on students' age, gender, socio-economic background, access to digital devices, and parental education levels. Digital Literacy Assessment: Adapted from existing digital literacy frameworks, this section measured students' ability to use digital tools, navigate online resources, and engage with digital content. It included Likert-scale items (e.g., 1 = Strongly Disagree, 5 = Strongly Agree) to assess various aspects of digital literacy.

Learning Outcomes: This section included questions related to students' academic performance in distance education, such as grades, assignment completion rates, and perceived learning effectiveness. Engagement in Distance Learning: To measure engagement, this section focused on students' participation in online classes, frequency of interaction with teachers and peers, and motivation to learn using digital tools. The questionnaire was pre-tested with a small group of students to ensure clarity and reliability.

Data Collection Procedure

The data collection process involved administering the questionnaire to the selected sample either online or through paper-based distribution, depending on the students' access to technology. Schools were contacted to facilitate the distribution of questionnaires, and instructions were provided to ensure consistent administration. The data collection period lasted for approximately two weeks.

Data Analysis

The data were analyzed using descriptive and inferential statistical methods:

Descriptive Statistics: Mean scores, standard deviations, frequencies, and percentages were calculated to summarize the demographic characteristics and responses related to digital literacy, learning outcomes, and engagement. Independent Samples t-test: This test was used to compare the digital literacy levels, learning outcomes, and engagement between male and female students.

Correlation Analysis: Pearson’s correlation coefficient was calculated to examine the relationship between digital literacy and learning outcomes, as well as between digital literacy and engagement. Regression Analysis: Multiple regression analysis was

conducted to determine the extent to which digital literacy predicted learning outcomes and engagement, while controlling for gender and socio-economic factors. Data analysis was performed using SPSS (Statistical Package for the Social Sciences), providing robust insights into the relationships between the variables.

Procedure

A survey form is provided for each student by physically to test the issues of distance learning using digital technology on students. A total of 30 items were asked for their low academic achievements. The survey question was intended to to analyze the impact of Digital literacy on learning outcomes in distance education among male and female students to evaluate the engagement based on gender using digital literacy tools. All questions were analyzed by means of statistics and numbers. Since the data for answer using the Likert scale is categorical. Only the data model and frequency are analyzed. The correlation coefficient of Pearson has been used to determine the linear correlation between two data variables.

Table No. 1

Impact of Digital literacy on learning outcomes in distance education among male and female students.

	Taunsa	Manghrotha	Shah Saddar din	Kot Qaisrani
Male	12.62%	15.18%	11.09%	11.44%
Female	8.32%	9.65%	10.76%	20.97%
Total	20.94%	24.83%	21.84%	32.39%

It reveals that males in Taunsa Tehsil have performed 12.62% while females perform 8.32% in total, they performed 20.94% whereas in Manghrotha Tehsil males have performed15.18% and female have performed 9.65% in total they performed 24.83% as well as in Tehsil Shah Saddar din male have performed 11.09% and female have performed 10.76% in total they performed 21.84% similarly in Tehsil Kot Qaisrani male have performed 11.44% and female have performed 20.97% in total they performed 32.39%.

According to this collected data Females in Tehsil Kot Qaisrani performed more 20.97% which is more than in Tehsil Manghrotha 15.18%. So, in Tehsil Kot Qaisrani the females performed better than males in Tehsil Manghrotha in total Impact of Digital literacy on learning outcomes in distance education.

Table 2.

Evaluate the engagement based on gender using digital literacy tools.

	Taunsa	Manghrotha	Shah Saddar din	Kot Qaisrani
Male	19.05%	09.13%	13.22%	8.67%
Female	6.24%	11.96%	05.45%	24.77%
Total	25.29%	21.09%	18.67%	33.44%

It reveals that males in Taunsa Tehsil have performed 19.05% while females perform 6.24% in total, they performed 25.29% whereas in Manghrotha Tehsil male have performed 09.13% and female have performed 11.96% in total they performed 21.09% as well as in Tehsil Shah Saddar din male have performed 13.22% and female have performed 05.45% in total they performed 18.67% similarly in Tehsil Kot Qaisrani male have performed 08.67% and female have performed 24.77% in total they performed 33.44%.

According to this collected data Female in Kot Qaisrani performed more24.77% which is more in Tehsil Taunsa 19.05%. So, in Kot Qaisrani the females performed better then male in Tehsil Taunsa in evaluate the engagement based on gender using digital literacy tools.

Table 3.

Impact of Digital Literacy in Distance Education comparatively analysis based gender.

Sr no.	*Tehsil*	*Performance by percentage*
1.	*Taunsa*	*35.4%*
2.	*Manghrotha*	*20.72%*
3.	*Shah saddar din*	*27.00%*
4.	*Kot Qaisrani*	*18.08%*

In an overall performance of total Four Tehsils in Tehsil Taunsa teachers performed 35.4% and in Tehsil Manghrotha teachers performed 20.72% and in Tehsil Shah Saddar din teachers performed 27.00% whereas in Tehsil Kot Qaisrani teachers performed 18.08%. Because in Tehsil Kot Qaisrani teachers performed low rather than others Tehsils of District Taunsa Sharif so there are the Role of Digital Literacy in Distance Education comparatively analysis based on Gender and their learning outcomes and engagements in this tehsil is very low. So there is need of digital literacy training for teachers and give awareness to the students.

Findings

The findings of this study revealed that digital literacy had a significant impact on learning outcomes and engagement in distance education among Islamic (madrasah school students in District Taunsa Sharif. Specifically, male students demonstrated higher levels of digital literacy compared to female students, which correlated with better academic performance and greater engagement in online learning activities. The study also found that students with higher digital literacy skills were more likely to participate actively in online classes and achieve higher grades, indicating the critical role of digital literacy in enhancing educational outcomes in a distance learning environment.

Recommendations

Based on the findings, the study recommended that schools in District Taunsa Sharif implement targeted digital literacy programs to bridge the gender gap in technology use. It also suggested that educators integrate more interactive digital tools to enhance student engagement, particularly for female students. Furthermore, the study advised educational policymakers to provide greater access to digital resources and training for both teachers and students to improve overall learning outcomes in distance education.

Conclusion

In conclusion that digital literacy played a crucial role in determining the success of distance education among Islamic (madrasah school students in District Taunsa Sharif. It highlighted the existence of gender disparities, with male students generally outperforming female students in digital proficiency, which translated into better learning outcomes and engagement. The findings emphasized the need for educational interventions to enhance digital literacy across all student groups, ensuring equitable access to quality education in a digital age.