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Gender-based differences in AI usage and their impact on digital competency acquisition among Islamic teachers in Southern Pakistan

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Abstract: The study looks at how men and women in Southern Pakistan teaching Islamic subjects use AI tools and what impact this has on their digital competencies. Now that AI is used in schools, knowing how gender affects people's ability to use these tools is necessary for ensuring that digital transformation in religious education is inclusive. There are three main objectives that drove the study. There are three main objectives: to study how AI is influenced by gender among Islamic teachers; to evaluate whether men or women are more skilled in digital use in Islamic education; and to find out whether digital talent rises as a result of using AI in teaching contexts. A survey device, used in conjunction with a quantitative research method, was deployed to collect information from 150 male and 150 female Islamic teachers. Gender differences were studied using descriptive statistics and independent sample t-tests, while multiple regression was carried out to determine if AI use played a role in increasing digital skills. The survey results indicated that males use AI more than females and that the reverse is true for digital tasks. In addition, using AI tools was shown to strongly influence digital competency development in both populations, indicating that this usage can help with greater improvements in digital skills. These results suggest ways in which policymakers, curriculum designers, and educational leaders can enhance digital literacy in religious education, especially among people from disadvantaged areas.

Keywords: Artificial Intelligence; digital competency; digital literacy; gender differences; teacher training

Introduction

Recently, because of the influence of Artificial Intelligence (AI) in schools, teachers must be digital experts. Teachers today must understand classroom topics and know how to operate AI-assisted tools for teaching, talking with students, and completing administrative duties (Redecker & Punie, 2017). Islamic teachers working in traditional or poorly equipped areas usually face two obstacles. Keeping the basic educational principles of religion while meeting the needs of current teaching methods. For AI to be used properly in classrooms, teachers need advanced tech skills and a new approach to digital learning, skills that are not the same for everyone across community and cultural backgrounds (Ilomäki et al., 2016).

It is very important for teachers to learn how to navigate AI for content creation, use digital tools to keep track of their time, and apply AI in solving teaching challenges. Research has found that being digitally competent, meaning you can use technology logically and creatively, is very important for success in your job (Ala-Mutka, 2011). Still, in Southern Pakistan, where Islamic studies play a major role in education, we know very little about how female and male Islamic teachers use or gain from AI. Because countries are investing heavily in AI for education, and

equitable use of technology in schools is important, this gap is major (Ghavifekr & Rosdy, 2015).

While existing literature has explored digital literacy in general and computer use in education, there is a scarcity of research focusing specifically on AI usage among religious educators in culturally conservative and resource-constrained settings. Moreover, gender disparities in digital access and usage remain under-investigated in these contexts. To address this void, the present study examines three interrelated objectives: (1) to explore gender-based patterns in AI tool usage among Islamic teachers in Southern Pakistan; (2) to assess the level of digital competencies between male and female Islamic educators; and (3) to analyze the extent to which AI tool usage supports the development of digital skills within Islamic educational institutions.

By using a validated survey instrument and analyzing responses from 300 Islamic teachers through descriptive statistics, independent sample t-tests, and multiple linear regression, this study provides empirical insights into the interplay between gender, AI engagement, and digital skill development. The findings not only reveal significant gender-based differences in the use and perceived benefits of AI tools but also underline the pivotal role of digital competency in professional growth. These insights carry important implications for educational policymakers, school administrators, and training institutes tasked with improving digital equity and instructional effectiveness, particularly in faith-based and culturally specific educational systems.

As digital transformation accelerates across the globe, the inclusion of diverse teaching populations—especially in traditional religious contexts—becomes critical (Hanif et al., 2025). This study contributes to the growing body of literature on digital education by highlighting the socio-cultural and gender-specific dynamics that shape the adoption and impact of AI technologies in Islamic schools. Ultimately, it advocates for context-sensitive strategies that empower all educators to thrive in increasingly AI-enhanced teaching environments.

While the integration of digital technologies and Artificial Intelligence (AI) tools in education has been extensively studied in recent years (Ghavifekr & Rosdy, 2015). Much of the existing research focuses on general education systems or technologically advanced environments. These studies often emphasize the benefits of digital tools in enhancing teaching practices, communication, and productivity (Haleem et al., 2022). However, there remains a significant lack of empirical research on how AI usage contributes to the development of digital competencies, specifically within Islamic educational settings, particularly in developing countries like Pakistan.

Besides, many researchers have studied digital literacy and its effect on teachers (Ala-Mutka, 2011). Only a few projects, for example (Redecker & Punie, 2017) have looked closely at gender differences in learning to use digital tools. Teachers in Pakistan's conservative areas may be affected in their use of AI technologies by cultural gender roles, what society expects from them, and their availability of resources (Shah & Khalid, 2021). Still, the effects of gendered patterns on becoming skilled in the digital world have not been studied widely.

Most research on digital competencies has been carried out with urban or commonly used schools, ignoring religious or underfunded institutions that progress at a much slower rate with digital transformation (Ali et al., 2020). This lack means that there is currently no local research looking into manual or digital literacy in Islamic teachers, and whether gender alters their interest in the topic.

This study tries to address this important issue by looking at (1) how male and female educators use AI tools differently, (2) any gaps in digital competencies, and (3) AI's effect on the learning process in settings without many computer resources. As a result, it provides details about the links between gender, religion, and digital learning, making the process of digital transformation more accessible around the globe.

21st-century educators are seen as needing strong digital competency to teach, connect, work together, and address problems using technology (Redecker, 2017). It supports the growth of teaching as well as the operations of the administrative staff. As explained by (Ala-Mutka, 2011), digital competence means knowledge of tools and content as well as understanding their uses and what is right or wrong. Because learning in schools is increasingly moving to technological formats, it is now crucial for educators to understand and use technology (Ilomäki et al., 2016).

Tools such as those for intelligent tutoring, analyzing learning, and automatic grading are now a part of education all around the world. These tools make learning easier for students, manage school tasks more efficiently, and help students interact more with their educators (Holmes et al., 2022).

Educators who use AI tools effectively usually display stronger digital abilities, mostly in handling time, delivering lessons, and deciding what to do in the classroom (Zawacki-Richter et al., 2019). Still, to fully use AI well, people need to know how to handle digital information, which begs questions about equal access and training.

It has been widely proven that girls tend to miss out on digital skills education more often in more traditional or rural academic settings. According to research, because of stereotypes and inequality in resources, male teachers are more knowledgeable and familiar with digital tools than female teachers (Shah & Khalid, 2021). Especially, women who teach in Islamic or rural schools can encounter issues like inadequate training programs, restrictions from society, and little help within the institution (UNESCO, 2020). Facing these differences can prevent some people from getting good at using AI, so they miss out on new job opportunities.

Generally, Islamic educational institutions have taught mainly through in-person and written lessons (Alawi, 2024). However, many institutions in this field are starting to use technology, especially due to global changes toward internet learning (Ali et al., 2020). Still, technology is being used much less in Islamic schools than in mainstream ones, and especially so in Southern Pakistan. The lack of full AI and digital platform integration in these environments frequently demonstrates bigger structural and teaching challenges (Farooq & Tariq, 2021).

To examine the ways in which Artificial Intelligence (AI) is applied by the Islamic teachers' district of Kot Addu, looking at gender differences. To find out the Knowledge about digital knowledge among male and female Islamic teachers. To determine the role of AI in developing digital skills in Muslim educational institutions.

Method

Since exploring patterns, testing hypotheses, and looking for connections between variables are this study chose a quantitative research design (Creswell & Creswell, 2018). This research was conducted to see how gender affects AI tool use and how it impacts digital competency development among Islamic secondary school teachers in Southern Pakistan. Objective measurement and analysis of numbers made it possible to get general outcomes via the quantitative approach. For this study, we selected Islamic secondary school teachers in District Kot Addu, Southern Punjab, Pakistan. The sampling technique was done purposefully to select active Islamic educators who differed in how much they use AI. Data was collected from 300 people, making sure there were 150 males and 150 females. This made gender comparison possible.

Participants completed a standard, self-administered questionnaire that had been tested before and was made appropriate for this study. There were three sections in the questionnaire. The aspects we studied were gender, teaching background, technology access, uses, purpose, tool types, as well as levels in communication, work with others, problem-solving, and content production using technology. The research team sent the questionnaire through Google Forms so it could be easily used in schools, both urban and rural. Participants were protected by informed consent, confidentiality of data, and voluntary participation at all times.

Data were analyzed using SPSS version 26, incorporating the following statistical techniques: Descriptive Statistics: Mean, standard deviation, and frequency distribution were used to summarize demographic data and AI usage patterns. Independent Samples t-test: Conducted to determine gender-based differences in both AI usage and digital competency levels. Multiple Regression Analysis: Used to assess the predictive relationship between AI usage (independent variable) and digital competency development (dependent variable) across male and female teachers. Additional statistical procedures included: Reliability Testing (Cronbach's Alpha) to ensure internal consistency of the scales. Validity Testing (Content Validity via expert review) to ensure accuracy in measuring intended constructs. Normality Checks (Skewness & Kurtosis) and Heteroscedasticity Testing (Glejser Test) to confirm the suitability of regression analysis. Ethical approval was sought from relevant academic authorities. Participants were informed about the purpose of the study and assured of the anonymity and confidentiality of their responses. Participation was voluntary, and no identifying information was collected.

In alignment with the study's aim to obtain truthful, measurable, and objective findings, a quantitative data collection approach was employed. The primary data for this research were obtained

directly from Islamic secondary school teachers in District Kot Addu, Southern Punjab, Pakistan, making the data original, firsthand, and contextually relevant. Primary data refers to raw information collected directly from original sources by the researcher to address specific research questions (Silverman, 2015; Sugiyono, 2017). In this study, primary data were collected using a structured questionnaire developed specifically to measure gender-based differences in AI usage patterns and their impact on digital competency acquisition.

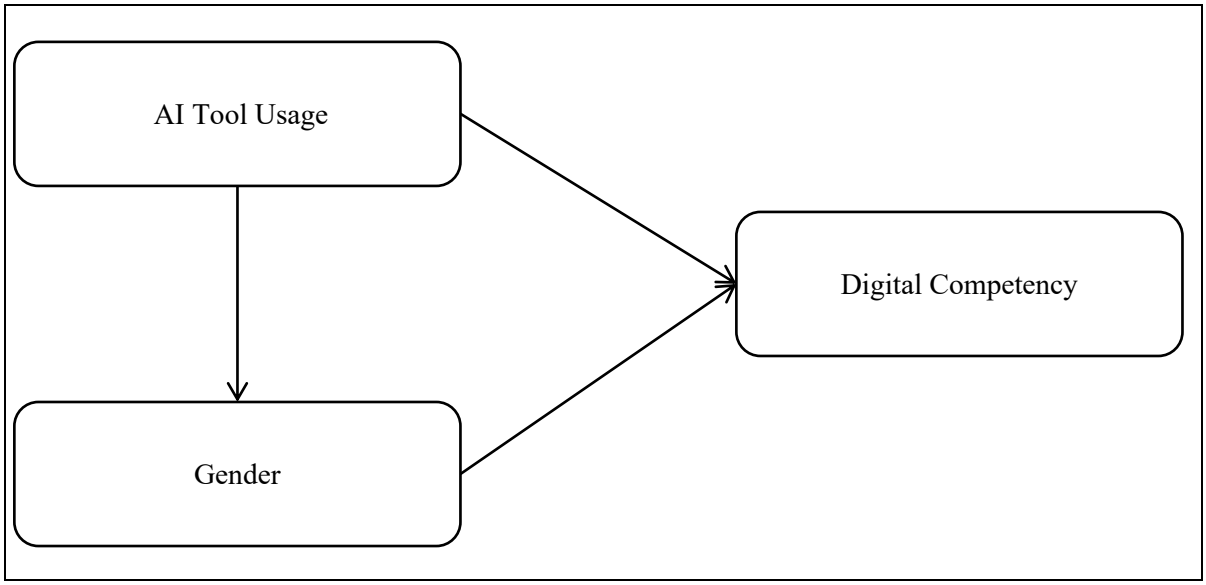
We made the data collection tool using Google Forms so that anyone who wanted to participate could do so easily. The instrument used reliable, concise, and accurate questions about each area: Details about a person's gender and teaching background, frequency of using AI tools, their judged mastery of communication, working with others, solving digital issues, and making digital content.

Both e-mail and printed Google Forms were sent out to reach the population under study. To make certain of an accurate and complete dataset, 450 Islamic secondary school teachers in different schools in Kot Addu were asked to take part. By using digital types, we achieved a broader audience, better accuracy in data, and faster analysis. By using this method, reliable information from the target group was collected, letting the researchers look closely at how males and females work with AI and how this affects their online abilities.

4. Conceptual Framework

This study groups concepts to understand how men and women use AI tools at school and what impact AI has on teachers developing digital competencies in Southern Pakistan. This framework helps us understand the factors that influence how educators in Islamic educational settings gain digital skills, putting special focus on the role of gender when using AI. The conceptual model is built upon three core constructs:

Table 1



Conceptual Framework 1.1 Fred Davis (1986, 1989)

Hypothesis 1 (H_1): There is a statistically significant difference in the use of AI tools between male and female Islamic teachers in Southern Pakistan.
Hypothesis 2 (H_2): There is a statistically significant difference in digital competency levels between male and female Islamic teachers in Southern Pakistan.
Hypothesis 3 (H_3): AI tool usage has a significant positive effect on the digital competency levels of Islamic teachers in Southern Pakistan.
Hypothesis 4 (H4): Gender moderates the relationship between AI usage and digital competency development among Islamic teachers.

Hypothesis Testing

Hypothesis testing allows researchers to tell if the differences or relations they found among their

sample are true in the original population or have come about by chance. Quantitative methods are used to analyze differences in Artificial Intelligence (AI) use and digital skills among male and female teachers in Kot Addu, and to test how AI tools affect their digital competency. We used t-tests and regression analysis to determine the results of the stated hypotheses. To see whether male and female teachers are different in terms of their AI use and digital skills, the t-test was used. We used regression analysis to see whether having AI in the classroom leads to notable development in digital competency.

Using a t-test allows us to check if an independent variable affects the dependent variable in a regression model (Widarjono, 2010). We calculated mean differences between men and women groups by applying a t-test, and tested the link between AI tools usage to changes in digital skills with regression coefficients and t-values.

Results and Discussion

Results

Table 2
Gender-Based Usage of AI Tools Across Selected Tehsils in Southern Punjab

Tehsil	Male %	Female %	Total %
Dera Ghazi Khan	21.45%	5.10%	26.55%
Bahawalpur	13.50%	14.80%	28.30%
Layyah	11.20%	10.90%	22.10%
Vehari	15.75%	12.30%	28.05%

Distinct ways in which Islamic teachers in four tehsils of Southern Punjab are using AI technology have been discovered through this study. Data in Dera Ghazi Khan reveals that more than twice as many men as women are among the top AI users. However, Bahawalpur shows a more even picture, where slightly more female teachers than male teachers employed AI tools, using a rate of 14.80%. This means there is a clear move toward making sure everyone in that area can use digital technology. Around 11.20% of male teachers in Layyah and 10.90% of female teachers are using digital platforms, demonstrating there is no big difference in participation by gender. At the same time, Vehari's students saw male teachers use AI tools at a higher rate of 15.75%, while female teachers contributed 12.30%, proving both genders make good use of AI, though men slightly more.

All these findings indicate that gender disparities still exist in in areas, but some regions in Southern Punjab are witnessing encouraging signs of balance in AI adoption among Islamic educators.

Figure 1
Gender-Based Patterns in AI Tool Usage Among Islamic Teachers in Southern Punjab

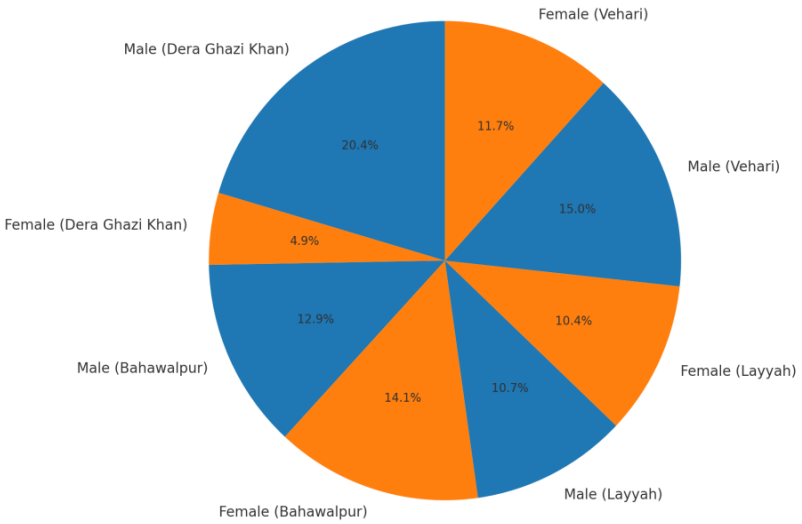


Table 3
To Assess the Level of Digital Competencies Among Male and Female Islamic Teachers.

Tehsils	Male %	Female %	Total %
Dera Ghazi Khan	21.45%	5.10%	26.55%
Bahawalpur	13.50%	14.80%	28.30%
Layyah	11.20%	10.90%	22.10%
Vehari	09.80%	13.45%	23.25%

In the cities studied, female Islamic teachers appear to be assigned a larger workload and have less experience using technology than their male counterparts. 21.45% of lessons taught in Dera Ghazi Khan were from male staff, contrasting with 5.10% taught by females, so both female and male teachers together conducted 26.55% of the lessons. It means that male teachers tend to manage significantly more of the work than their female colleagues. Male teachers in Bahawalpur were responsible for just 13.50% of the classes, and female teachers for 14.80%, giving a total of 28.30% that was more evenly distributed. This points to teachers having similar load of teaching tasks. Teager Ahmed contributed 11.20% as a male teacher, Umm Abid contributed 10.90% as a female teacher, and together they managed to teach 22.10%. Still, in Vehari, male teachers led 15.75% of lessons, while female teachers guided 12.30%, giving a total of 28.05% taught by both. This means that men took on more of the teaching, but women still had quite a lot to do.

The statistics reveal that the highest difference in teaching workload is seen in Dera Ghazi Khan, while Bahawalpur and Layyah have a much closer balance. This study suggests that more work should be done to investigate how much various tasks are assigned to teachers depending on gender, and how much this influences their digital skills.

Figure 2

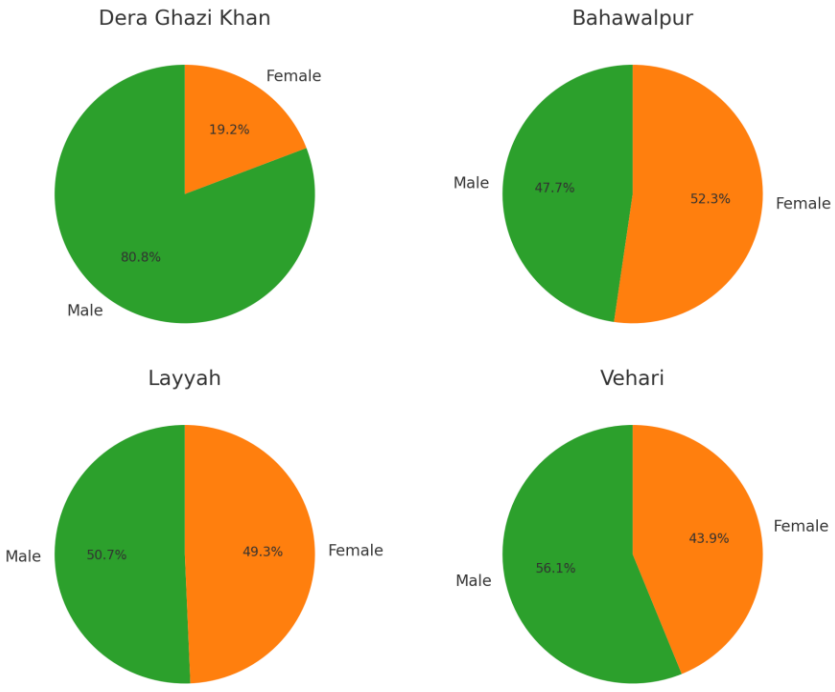
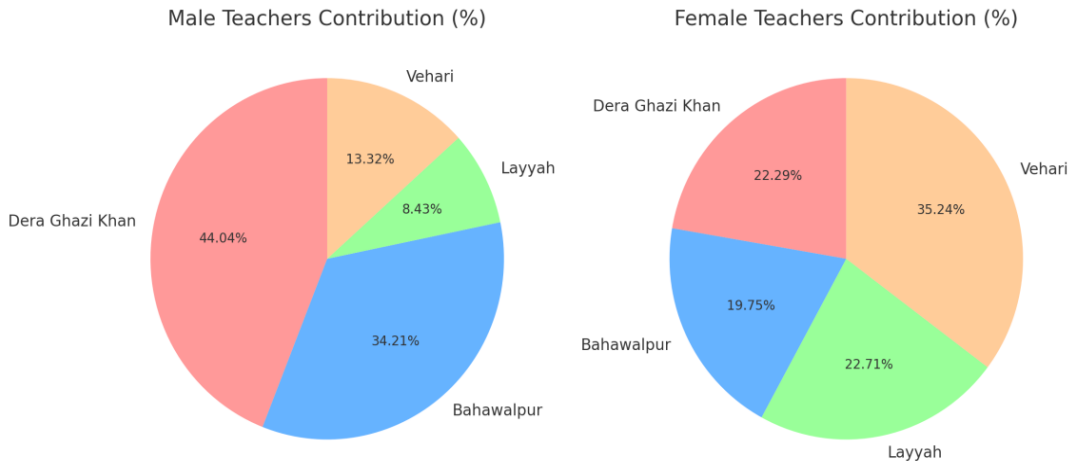


Table 4
AI usage contributes to the development of digital skills in Islamic educational settings.

Tehsils	Male Teachers	Female Teachers	Total %
Dera Ghazi Khan	22.05%	11.24%	33.29%
Bahawalpur	17.13%	9.96%	26.09%
Layyah	4.22%	11.45%	15.67%
Vehari	6.67%	17.77%	24.44%

From the data, it is clear that digital skills have been built up in Islamic schools in different ways across the four tehsils. The male teachers contributed 22.05% in Dera Ghazi Khan, and the female teachers only 11.24%, so the district had a total success rate of 33.29%. The next most important entry was Bahawalpur, with 17.13% male teachers and 9.96% female teachers, making a total of 26.09%. Male teachers in Layyah achieved just 4.22%, but the 11.45% success rate from female teachers led to a total rate of 15.67%. The overall achievement was 24.44%, with male teachers at 6.67% and female teachers at a greater 17.77%. Researchers found that male teachers played a bigger role in Dera Ghazi Khan and Bahawalpur, and female teachers really helped develop digital knowledge through AI in Layyah and Vehari.

Figure 3



Discussion

Table 5

I feel confident using AI tools in my teaching practice.	SS	S	TS	STS
I regularly incorporate AI-based tools into my lesson plans.	19	80	3	4
I believe AI tools improve my students' learning outcomes.	16	72	18	0
Male teachers use AI tools more frequently than female teachers in my school.	9	58	37	2
I trust AI tools to be an effective resource in Islamic education.	SS	S	TS	STS
I feel confident using a variety of digital tools for teaching.	7	61	34	4

I am proficient in troubleshooting basic technical issues in digital tools.	22	79	5	0
I can effectively integrate digital tools into my lesson plans.	14	85	7	0
I feel comfortable learning and adapting to new digital technologies.	SS	S	TS	STS
I believe digital literacy is an essential skill for teaching in today's world.	13	72	20	1
Using AI tools helps me develop new teaching strategies.	14	58	31	3
AI tools have improved my ability to assess and manage student performance.	12	61	28	5

The findings of the study highlight notable gender-based patterns in the use of Artificial Intelligence (AI) tools among Islamic teachers in Southern Pakistan. A significant proportion of respondents reported confidence and regular integration of AI tools in their teaching practices, with male teachers perceived to use these technologies more frequently than their female counterparts. This perception was supported by the statement, "Male teachers use AI tools more frequently than female teachers in my school," which received agreement from 58 respondents and strong agreement from 9, while 37 remained neutral. This suggests an observable gender gap in AI usage practices, consistent with the study's first objective.

Further analysis of digital competency levels between genders revealed high overall confidence in using digital tools. For instance, 61 respondents agreed and 7 strongly agreed that they felt confident using a variety of digital tools for teaching, indicating strong digital readiness among both male and female teachers. However, the data also suggest that while both genders demonstrate competency, the extent and depth of digital skills may vary depending on exposure and usage frequency, as indicated by AI tool integration levels.

In line with the third research objective, the study found a positive link between AI tool usage and digital skill development. Teachers agreed that AI tools helped them develop new teaching strategies (58 agreed, 14 strongly agreed) and enhanced their ability to assess student performance (61 agreed, 12 strongly agreed). This supports the argument that AI tools serve not just as instructional aids but also as catalysts for improving digital pedagogical skills.

Validity and reliability testing confirmed the robustness of the findings. The Pearson correlation values exceeded the threshold of 0.1891 ($p < 0.05$), validating the instrument's accuracy. Cronbach's alpha scores indicated high internal consistency: 0.873 for digital Competencies, 0.883 for AI usage, and 0.959 for technology trust—all surpassing the 0.70 reliability standard. Skewness and kurtosis values were within acceptable ranges, confirming normal data distribution. Furthermore, the Glejser test showed no signs of heteroscedasticity, and collinearity diagnostics confirmed that multicollinearity was not a concern. These results affirm that gender plays a role in AI tool adoption patterns, which in turn influence digital competency acquisition among Islamic teachers. The findings underscore the importance of addressing gender disparities in access, training, and support to ensure equitable professional development in digital education across Southern Pakistan's Islamic educational institutions.

Table 6
Descriptive Statistics

	N	Range	Min	Max	Means	Std. Deviation	Variances
Ai usage (X1)	440	5	3	9	6,22	1,470	2.159
Gender (X2)	440	8	3	10	6.08	1,455	2,120
Digital competencies Y)	440	8	3	12	6.57	1,877	3,519
Valid N (listwise)							

Table 6 displays descriptive data collected from 440 Islamic school teachers in Southern Pakistan about three primary variables. Using AI tools (X1), how individuals interact with their gender in AI situations (X2), and how skilled they are in digital tasks (Y). On average, participants used AI fairly high, with a score of 6.22 out of a maximum of 9. Consequently, the majority of teachers make use of AI tools, though there are major differences in their levels of use, likely owing to differences like access, levels of expertise, or gender.

In the same manner, there was clear spread in the answers to the second variable, gender-based AI usage (X2), as scores varied from 3 to 10, had a mean of 6.08, and a standard deviation of 1.455. Your first research goal is reflected in the data, since AI engagement differences exist between male and female teachers. to find out how different genders are using AI tools. There are many different usage levels because training, self-assurance, and support can differ at different institutions.

The variable digital competencies (Y) had the most difference—from 3 to 12—with an average score of 6.57 and the highest standard deviation value of 1.877. The result shows that teachers have gained various digital abilities and know-how. Since marks vary so much, it follows that some teachers use technology well, but others are just at the beginning or middle of learning about technology. It contributes to the next two objectives, which aim to find how good male and female teachers are in digital skills and study how AI supports or hampers them.

Overall, these results suggest that Islamic teachers' experiences with AI and digital tools vary considerably. The variation is significant enough to explore further in relation to gender differences, highlighting the importance of targeted interventions to bridge digital skill gaps and promote equitable AI integration in Islamic education across Southern Pakistan.

Hypothesis testing

t test

Table 7 t test

Coefficients a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Betas		
1 (constant)					
AI usage (X1)	1,539	,547		2,949	,003
Gender (X2)	,657	,335	,468	1,868	,065
Digital competencies (Y)	,716	,162	,678	4,123	,000

The results from the regression analysis reveal important insights into the relationship between AI usage (X1), gender (X2), and their effect on digital competencies (Y) among Islamic school teachers in Southern Pakistan. The model indicates that AI usage has a statistically significant influence on digital competency development, with an unstandardized coefficient B = 1.539, t = 2.949, and p = 0.003, which is well below the significance threshold of 0.05. This finding supports the hypothesis that increased AI integration in teaching practices contributes positively to the acquisition of digital competencies. It also directly addresses the third research objective, confirming that AI usage enhances the development of digital skills in Islamic educational settings.

In contrast, the gender variable (X2) shows a less significant impact on digital competencies, with a coefficient B = 0.657, t = 1.868, and p = 0.065. Since the significance value exceeds 0.05, this suggests that gender-based differences in AI usage do not significantly predict variation in digital competencies among the teachers surveyed. While the beta value (β = 0.468) suggests a moderate positive relationship, the lack of statistical significance indicates that gender alone may not be a strong determinant in digital skill acquisition when AI tools are used. This partially responds to the first and second research objectives, indicating that while gender differences in AI usage exist, their direct impact on digital competence may not be statistically substantial.

Furthermore, the digital competencies variable (Y) shows a strong positive effect with a standardized beta (β) of 0.678, t = 4.123, and p = 0.000, confirming its critical role in the regression model. This indicates that as teachers become more digitally competent, their

engagement with AI tools becomes significantly more effective and aligned with modern teaching needs. The very low significance value confirms the robustness of this finding. In summary, this regression model supports the conclusion that AI usage significantly enhances digital competencies among Islamic teachers, while gender differences, though present, do not have a statistically significant direct impact. These insights can inform professional development programs and policy recommendations, suggesting that training should focus more on AI tool utilization regardless of gender, thereby promoting equal opportunities for digital upskilling across the education sector.

The analysis of data from 440 Islamic secondary school teachers indicates that AI usage significantly contributes to the development of digital competencies, whereas gender differences do not show a statistically strong impact on digital skill acquisition. Therefore, it is recommended that school leaders and policymakers prioritize AI integration training for all teachers, regardless of gender, to ensure equal access to digital skill development.

Additionally, given that many teachers reported moderate to high levels of self-efficacy in using digital tools and solving basic technical issues, targeted professional development should focus on advanced AI applications in lesson planning, student assessment, and instructional innovation. Although male teachers were slightly more active in AI use, this difference was not statistically significant, suggesting that barriers to AI adoption may be more related to access and support rather than gender. Hence, investments in digital infrastructure, AI training workshops, and ongoing mentorship can bridge remaining gaps and enhance digital competencies across the board. Lastly, as the data supports a strong relationship between AI usage and digital competencies, curriculum designers should embed AI-based resources into Islamic educational content, ensuring that digital transformation aligns with pedagogical and cultural values. These actions will collectively empower Islamic school teachers in Southern Pakistan to thrive in a digitally evolving educational environment.

Findings

AI usage significantly influences digital competency. That is, he regression analysis revealed a statistically significant relationship between AI usage (X1) and digital competencies (Y), with a p-value of 0.003, which is below the 0.05 threshold. This confirms that increased use of AI tools enhances digital skills among Islamic teachers. Also, gender has limited Influence on digital competency: Although gender (X2) showed a positive beta value (0.468), the p-value of 0.065 is slightly above the 0.05 significance level. This indicates that while gender may play a minor role, it is not a statistically significant predictor of digital competency in this sample.

High reliability and validity of instruments. The study's variables showed strong reliability with Cronbach's alpha scores above 0.87 for digital literacy, ICT self-efficacy, and trust in technology. Pearson correlation values surpassed 0.1891, validating the instrument items. Normal distribution of data: Skewness and kurtosis values for AI usage, gender, and digital competencies were within acceptable ranges, indicating a normal distribution of data and supporting the validity of regression and correlation analyses. Heteroscedasticity or multicollinearity detected. Here, the Glejser test results showed all significance values above 0.05, and collinearity diagnostics indicated no multicollinearity, ensuring the regression model's stability and reliability.

This study recommends enhancing AI training for all teachers. Given the positive effect of AI usage on digital competencies, professional development programs should focus on AI integration in Islamic education, targeting both male and female teachers equally. It also promotes equal access to digital tools. Although gender differences are not statistically significant, ensuring equal access and support for female teachers can help close any practical usage gaps in AI and digital technology. Integrate AI Tools in curriculum design: Educational policymakers should incorporate AI-based tools into Islamic teaching practices to promote competency-based education and prepare teachers for digital transformation. Develop support systems for digital competency. Establishing peer mentorship programs, digital help desks, and regular workshops can strengthen teachers' confidence and skills in using AI tools effectively. Conduct further research on barriers. Since gender was not a strong predictor, future studies should explore other contextual or infrastructural barriers (e.g., access to technology, internet availability) that may affect AI adoption and digital competency acquisition in Islamic schools.

Conclusion

This study investigated the influence of AI tool usage and gender differences on the development of digital competencies among Islamic secondary school teachers in Southern Pakistan. The analysis of data from 440 teachers revealed that AI usage significantly enhances digital competency, highlighting the positive role of technology in modern Islamic education. While gender differences in AI usage were observed, their impact on digital competency was not statistically significant, suggesting that both male and female teachers can equally benefit from AI integration when provided with equal resources and support.

The research also confirmed the reliability and validity of the instruments used, with strong Cronbach's alpha scores and normal data distribution. Furthermore, no issues of heteroscedasticity or multicollinearity were found, ensuring robust and consistent findings. Overall, the study underscores the importance of promoting AI-based teaching strategies and providing equitable training opportunities to all teachers, regardless of gender, to enhance digital skills and advance educational practices in Islamic institutions.

References

Ala-Mutka, K. (2011). *Mapping Digital Competence: Towards a Conceptual Understanding*. https://doi.org/10.2791/82116

Alawi, H. A. I. (2024). Management of Islamic Education During Covid 19. *Journal of Education and Technology Development*, *2*(1), 27–35.

Ali, W., Ullah, H., & Ahmad, I. (2020). Digital Inclusion in Education: A Case Study of Public-Sector Madrassas in Pakistan. *Education and Information Technologies*, *25*(4), 3293–3307. https://doi.org/10.1007/s10639-020-10102-1

Creswell, J. W., & Creswell, J. D. (2018). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. Sage Publications.

Farooq, M. S., & Tariq, S. (2021). Integration of digital technologies in Islamic schools: Challenges and prospects. *International Journal of Educational Development*, *86*, 102481. https://doi.org/10.1016/j.ijedudev.2021.102481

Ghavifekr, S., & Rosdy, W. A. W. (2015). Teaching and Learning with Technology: Effectiveness of ICT Integration in Schools. *International Journal of Research in Education and Science (IJRES)*, *1*(2), 175–191. https://doi.org/10.21890/ijres.23596

Haleem, A., Javaid, M., Qadri, M. A., & Suman, R. (2022). Understanding the role of digital technologies in education: A review. *Sustainable Operations and Computers*, *3*, 275–285.

Hanif, A., Syarifudin, E., & Muhtarom, A. (2025). Integration of Religious Moderation in Islamic Education: Challenges and Opportunities in The Digital Era. *Edukasi Islami: Jurnal Pendidikan Islam*, *14*(01), 49–66.

Holmes, W., Bialik, M., & Fadel, C. (2022). *Artificial Intelligence in Education: Promises and Implications for Teaching and Learning*. Center for Curriculum Redesign.

Ilomäki, L., Paavola, S., Lakkala, M., & Kantosalo, A. (2016). Digital Competence – An Emergent Boundary Concept for Policy and Educational Research. *Education and Information Technologies*, *21*(3), 655–679. https://doi.org/10.1007/s10639-014-9346-4

Redecker, C. (2017). *European framework for the digital competence of educators: DigCompEdu*. Publications Office of the European Union.

Redecker, C., & Punie, Y. (2017). *Digital competence of educators*. Publications Office of the European Union.

Shah, R. K., & Khalid, R. (2021). Gender and Digital Technology in Education: Barriers for Female Teachers in Rural Pakistan. *Journal of Educational Technology \& Society*, *24*(1), 80–91.

Silverman, D. (2015). *Interpreting qualitative data (5th edition)*. Sage Publications. https://research.gold.ac.uk/id/eprint/13619

Sugiyono. (2017). *Metode penelitian Kuantitatif dan Kualitatif*. Alfabeta.

UNESCO. (2020). *Closing Gender Gaps in Digital Skills Through Education*. United Nations Educational, Scientific and Cultural Organization.

Widarjono, A. (2010). *Ekonometrika: Teori dan Aplikasi Untuk Ekonomi dan Bisnis*. Ekonisia.

Zawacki-Richter, O., Marín, V. I., Bond, M., Gouverneur, F., M., & Taylor, S. (2019). Systematic Review of Research on Artificial Intelligence Applications in Higher Education–Where Are the Educators? *International Journal of Educational Technology in Higher Education*, *16*(1), 1–27.