

Exploring Gender-Based Variations in Functional Skill Development: Influence of AI Usage and Digital Competencies Among Islamic teacher's in southern Pakistan

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Abstrak

Penelitian ini melihat bagaimana guru sekolah menengah di Pakistan Selatan melakukan fungsi yang berbeda tergantung pada jenis kelamin mereka dan pengaruhnya terhadap penggunaan AI dan keterampilan digital mereka. Sekarang alat digital banyak digunakan dalam pendidikan, menyoroti perbedaan antara pendidik laki-laki dan perempuan membantu memastikan laki-laki dan perempuan tumbuh secara profesional pada tingkat yang sama. Para sarjana belum menyelidiki bagaimana gender memengaruhi AI dan integrasi keterampilan digital di sekolah-sekolah Islam. Saya berangkat untuk: (1) mencari tahu apakah ada perbedaan keterampilan fungsional antara guru Islam laki-laki dan perempuan; (2) menilai bagaimana AI memengaruhi pengembangan keterampilan fungsional di seluruh pria dan wanita; dan (3) menganalisis apakah kompetensi digital berperan dalam membentuk korelasi ini. Para peneliti menggunakan metode kuantitatif dan menyampaikan kuesioner yang telah terstruktur sebelumnya kepada guru-guru di sekolah menengah Islam di wilayah selatan Pakistan. SPSS 22 digunakan untuk analisis data dengan menerapkan statistik deskriptif, korelasi dan regresi berganda. Para peneliti menemukan bahwa pria berkinerja sedikit lebih baik dalam tugas-tugas terkait teknologi, sementara wanita paling banyak menggunakan AI saat mengajar. Selain itu, hubungan antara penggunaan AI di sekolah dan peningkatan keterampilan fungsional terutama dipengaruhi oleh kompetensi digital ($p < 0,05$). Studi ini menunjukkan bahwa kebijakan dan program pelatihan yang efektif untuk kesetaraan gender mendorong guru untuk meningkatkan penggunaan AI dan teknologi digital mereka. Berdasarkan temuan tersebut, pendidik di sekolah Islam dapat meningkatkan pelatihan guru dan mengurangi perbedaan keterampilan digital antar sekolah.

Abstract

Key Word:

Functional Skills, Women and Men, AI in Education, Digital Competence, Muslims, Southern Pakistan

The research looks into how secondary school teachers in Southern Pakistan perform different functions depending on their gender and the effect it has on their use of AI and digital skills. Now that digital tools are widely used in education, highlighting the distinctions between male and female educators helps ensure men and women grow professionally at the same level. Scholars have not investigated how gender affects AI and digital skill integration in Islamic schools. I set out to: (1) find out if there are differences in functional skills between men and women Islamic teachers; (2) assess how AI affects the development of functional skills across men and women; and (3) analyze if digital competencies play a role in shaping this correlation. Researchers used a quantitative method and delivered a pre-structured questionnaire to teachers in Islamic secondary schools in the southern region of Pakistan. SPSS 22 was used for the analysis of data by applying descriptive statistics, correlation and multiple regression. Researchers found that men performed slightly better in technology-related tasks, while women made the most use of AI while teaching. Moreover, the link between using AI at school and improved functional skills was mainly influenced by digital competency ($p < 0.05$). The study suggests that effective policies and training programs for gender equality encourage teachers to improve their use of AI and digital technologies. Based on these findings, educators at Islamic schools can improve teacher training and reduce differences in digital skills between schools.

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INTRODUCTION

Today, AI and digital skills are having a growing impact on the abilities of teachers all around the world. Teachers and students rely on communication, using critical thinking, solving problems and managing time for successful teaching and learning in the classroom today (World Economic Forum, 2020). Still,

differences in how male and female teachers handle digital technologies may lead to problems of equality, effectiveness and inclusivity in teaching in most sections of society and Islamic schools in Southern Pakistan.

Using AI in education gives teachers the chance to improve their work and the quality of lessons taught. The degree of a teacher's digital competency relates to their skills in using AI-driven tools for different tasks (Kong et al., 2021). Because of social norms, differences in resource access and support in schools, gender differences in digital learning are still present (UNESCO, 2022). Lack of training, digital resources and motivation can pose challenges for female teachers when trying to acquire new skills (Ameen & Willis, 2019).

Research is lacking in understanding the way gender affects the use of AI and the development of functional skills in schools promoting the study of Islam.

Surprisingly, not many investigations have surveyed digital competencies and AI using a gender perspective in Islamic schools in Pakistan. As a result of this gap, there are fewer efforts in education to take gender and tech skills into account when creating policies and support programs.

New research shows that digital skills are strongly connected to a teacher's professional achievements when used in informal or technology-based learning situations (Ng, 2012; Mishra et al., 2020). When digital tools are not equally available and gender norms can limit a person's career, teachers must pay close attention to these matters in Southern Pakistan. Some educators in these schools now depend on mobile applications, artificial intelligence and online learning sites to help their students, but they are still affected by issues such as the absence of proper infrastructure, skilled teachers and rules. This information leads to the objectives that are set out in this study. (1) to understand the variations in how male and female Islamic teachers in Southern Pakistan have developed their skills related to teaching Islam. (2) to understand how men and women change their skills due to using AI. (3) to study how digital skills play a role in linking AI with the development of teachers' functional skills, both for men and women.

This paper aims to provide evidence from studies on gender, digital technology and education in Islamic schools. The study examines the effects of AI and digital competencies on functional skills through gender, giving key recommendations for improving religious education in schools. The purpose and objectives of the study To see how the functional skills of male and female Islamic teachers differ in Southern Pakistan. To discover how AI is affecting the skills used by Islamic teachers of both genders. This aims to study how digital skills play a role in mediating or regulating how AI helps teachers develop their skills and abilities.

Objectives of the study

1. To examine the differences in functional skill development between male and female Islamic teachers in Southern Pakistan.
2. To assess the impact of AI usage patterns on the functional skills of Islamic teachers across gender groups.
3. To analyze how levels of digital competencies mediate or moderate the relationship between AI usage and functional skill development among male and female teachers.

Literature Review

Functional Skills Development in Education

Communication, problem-solving, critical thinking and good time management are the main skills teachers should have to succeed at work today (European Commission, 2019). With these abilities, educators are able to address the difficulties of different learning environments, accept new technologies and boost student participation (Mansor & Halim, 2021). In recent years, teachers' digital skills and knowledge have become more important for their ability to develop useful skills in teaching (Kareem & Al-Samarraie, 2022). It has been shown that better use of digital tools by teachers helps them effectively teach and manage the school administration (Mishra et al., 2020).

The Impact of Gender on Developing Functional Skills

Researchers have identified that boys and girls are not learning similar digital skills and functional abilities in schools. Many female teachers experience obstacles when it comes to using technology and studying further compared with men, who have more opportunities (Ameen & Willis, 2019; UNESCO, 2022). According to Hatlevik et al. (2018), males usually feel more confident using technology which is linked to their ability to use these skills in practical ways. At the same time, female educators use their relationships with peers as a way to become more qualified (Kong et al., 2021). These differences in outcomes by gender should be addressed to promote equality among all professionals and students.

Information on how Teachers Engage in Using AI

The use of AI has revamped education by adapting learning to each student, handling routine tasks automatically and improving the education materials shared (Luckin et al., 2016). Teachers' adoption of AI

depends on their digital skills, support from their school and their personal beliefs (Holmes et al., 2019). A study by Joo et al. (2021) proves that educators who make use of AI in education enhance their critical thinking and problem-solving abilities. Still, there is a discrepancy between who has the needed tools or training to use AI and those who do not, particularly for teachers (OECD, 2020).

Digital Competencies Play the Role of a Mediator

Digital competencies refer to the abilities and knowledge one needs to use digital technology at work (European Commission, 2018). They play an important role in how technology use relates to the acquisition of functional skills (Ng, 2012). Mishra et al. (2020) suggest that teachers who have well-developed digital competences adjust better to new teaching technology, including AI and as a result improve their overall abilities. Digital literacy courses increase teachers' self-assurance and performance, raising the standard of their teaching (Sánchez-Cruzado et al., 2020).

An example of context in Islam is found through Islamic schools in Southern Pakistan.

There is a lack of modern technology, traditional gender-based customs and non-equitable chances for professional growth in the educational setting of Islamic secondary schools in Southern Pakistan (Ameen & Willis, 2019). It is found that educators in these schools rely more on mobile apps and WhatsApp groups, yet still face issues with insufficient resources and skills from their institutions (Khan et al., 2023). It is clear that women in education encounter greater difficulties when it comes to getting hold of the necessary training and tools for AI projects (Ali & Hussain, 2021). Such a local setting calls for gender-based policies to help develop digital and functional skills among students at these schools.

Research Gap

Even as AI and digital learning are increasingly regarded in Pakistan, not much research has focused on whether there are gender-related differences in the development of Islamic teachers' skills. The majority of relevant studies concentrate on the topic of digital skills or AI in schools without differentiating the results by gender or custom factors in Islamic education (UNESCO, 2022). The research was carried out to determine the disparities in men and women's use of AI and digital skills in South Pakistan's Islamic high school settings.

METHODS

The research approach used in the study was quantitative to examine gender variations in secondary Islamic school teachers' growth in functional skills, while also considering their AI use patterns and digital abilities in Southern Pakistan. According to Creswell (2014), quantitative methods help to measure and study the links between variables using statistical approaches in a set population. For the 420 teachers selected from Islamic secondary schools in Muzaffargarh and the neighboring districts, purposive sampling was used. Only teachers with hands-on experience in AI and digital learning, as well as teaching experience, were included in the group (Etikan et al., 2016). A survey designed from reliable sources and frameworks, including DigCompEdu's model, was used to collect the data. The survey addressed the use of AI, people's skills in communicating, producing content online, being safe online and solving problems, as well as practical skills like communication, being organized, critically thinking and solving problems. People completed the questionnaire using printed papers or via Google Forms for those who lived in rural and semi-urban areas. SPSS version 22 was used to process and describe the information in the data. In order to show that our measures are reliable and valid, Cronbach's alpha and factor analysis were used.

To measure the connections between using AI, having digital skills and strengthening functional skills, researchers employed both correlation and multiple linear regression techniques. Variances between genders were measured by independent samples t-tests and one-way ANOVA. The use of this design together with thorough statistical methods and selection of Islamic teachers supports a proper analysis of digital capabilities and their use of AI.

Getting and storing the data.

To understand the effect of AI and digital skills on the development of skills among Islamic secondary school teachers in Pakistan, data was collected using a quantitative process. Using a questionnaire in the way Sugiyono (2017) suggests, primary data for this study were obtained directly from Islamic teachers themselves, as the firsthand information needed for the study. Key variables were selected and included in the questionnaire such as how individuals use AI, their digital skills in communication, content generation, safety online and problem-solving and the final skill areas they gained from education. Responses to questions used a Likert scale where 1 signified "strongly disagree" or "never," and 5 meant "strongly agree" or "always." Experts in this area examined the questionnaire to ensure it was clear, proper and correct.

Because teachers in rural and semi-urban schools were faced with barriers, Google Forms was used to safely collect data which avoided inconvenience and lessened the likelihood of mistakes. Among 420 Muslim educators, those who were actively teaching and who used AI and related digital technology in school or outside classes were chosen for the study using purposive sampling. Its aim was to add teachers from many kinds of schools to the study, so that the results would reflect the range of experiences using AI and technology among teachers (Etikan et al., 2016). The acquired information was checked using statistics to find out how much the skills differed for teachers of each gender and to study the impact of technology and AI on skill improvement among these instructors. According to Sugiyono (2017), using primary data from the users makes the findings more reliable and valid.

Study Area

The research was performed in the Muzaffargarh district which is known for its diversity in social and economic situations. Practicing agriculture and engaging in temporary jobs greatly affects the local way of life and the ways people use their resources. Because there are so many rural people here, modern technologies such as computers and high-speed internet are not always available to students. Fewer government schools are found in the district, but more Islamic secondary schools are praised for their attention to religious and moral issues. Although studying is free under the law, schools in Muzaffargarh still lack enough learning facilities, suitable teachers and technology.

Since informal opportunities for learning are more common than formal ones, many secondary school teachers in Islamic education use applications and online platforms for growth and development. The social and economic setting, along with the state of infrastructure, helps explain the differences in how teachers develop functional skills, as well as their use of AI. Since there are not many resources in Muzaffargarh, teachers there use informal online resources to adapt and improve their teaching skills.

Data Collection

The researchers applied quantitative methods to find out if the use of AI and digital competencies affects the functional skills of teachers in Islamic secondary schools in Southern Pakistan. Students and teachers from secondary Islamic schools in the Muzaffargarh district were studied to find gender differences related to different skills and their experience with AI. A questionnaire was made to secure necessary information for the study. Among the instrument's fixed-response questions were ones that tracked AI tool use and asked learners about their digital skills in various areas. Distributing the questionnaire through Google Forms was beneficial, as both rural and semi-urban teachers could conveniently join, where collecting data normally is not easy.

The initial invitation went out to 500 teachers to join, so there would be a mix of teachers from different schools, skills, ages and experience with AI. The process resulted in the analysis of 420 valid answers. The relationships between AI, digital competencies, gender and functional skills were studied using SPSS version 22, descriptive statistics, correlation, regression analysis, t-tests and ANOVA. The study showed that using AI and having digital competencies enhances functional skills, though the results were noticeably different by gender. Everyone's private and confidential responses were used only for the research. The results of the study indicate that for teachers in Southern Pakistan, using AI and developing digital skills is important for raising their functional skills.

Conceptual Framework

The study described how using AI and digital skills influences the building of fundamental skills among Islamic secondary school teachers in the Muzaffargarh district of Pakistan. The idea is that teachers develop and strengthen their abilities by being guided by AI-based resources and digital systems that encourage communication, making and using content, solving problems and collaboration on the internet. In this context, AI use and digital skills are the main factors and the outcome is the development of basic skills. Furthermore, gender is seen as an important factor to analyze differences between how men and women influence their students. Examples of using AI are found in intelligent tutoring, AI-implemented educational apps and platforms that adjust to a learner's needs, while digital competencies involve communicating online, creating content, staying safe and solving problems.

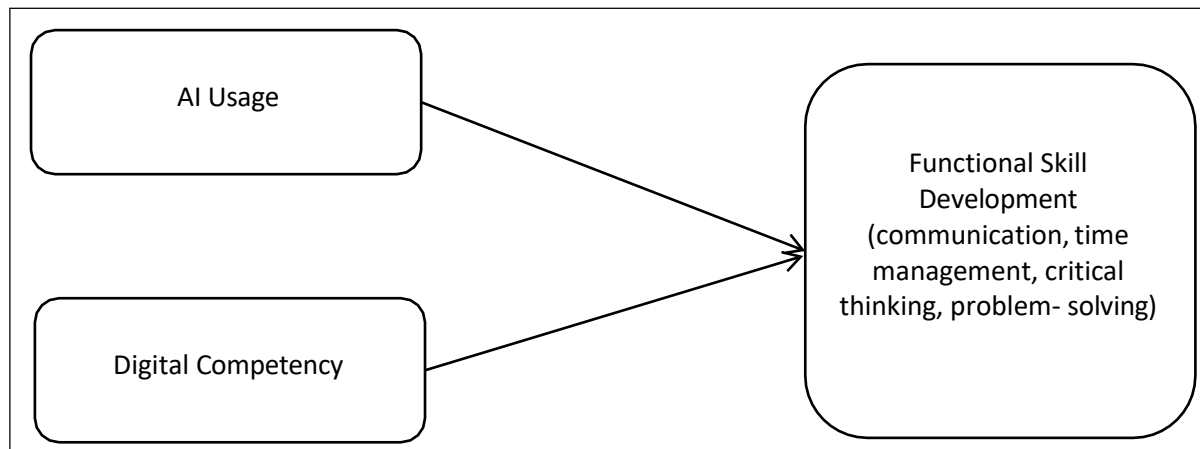
H1: Male and female Islamic teachers in Southern Pakistan do not have the same level of developed functional skills.

AI is strongly linked to changes in Islamic teachers' skills in Southern Pakistan.

H3: How well Islamic teachers use digital devices moderates the link between AI use and enhancing their abilities.

There is a noticeable link between gender and how someone uses AI when improving functional skills.

H5: Being of a certain gender plays a significant role in how digital competencies contribute to the development of functional skills
Individuals with better digital abilities tend to have better functional skills than those with lesser digital knowledge.



Conceptual Framework Connectivism Learning Theory (Siemens, 2005) Hypotheses

Hypothesis Testing

It is through hypothesis testing that the study learns how important and strong the relationships between gender, AI usage, digital skills and the development of functional skills in Islamic secondary schools in Southern Pakistan really are. This research aims to discover how the use of AI in teaching and variations in digital competency by gender help improve important abilities in teachers of Muzaffargarh district, Southern Punjab, Pakistan. Researchers use descriptive statistics, correlation analysis and multiple linear regression to check if any relationship exists between the amount of AI use and teachers' digital skills and their functional performance. The variables in the study are AI use trends and levels of digital skills and the outcome measured is progress in functional skills. The study uses gender as a factor to explore differences between male and female teachers in Islam. Tools are used to assess skills by reference to actual teaching which also aligns with current digital standards.

To test the hypothesis, different analyses will be done on the data to compare the dependence of AI and digital competency on gender among teachers. Regression analysis will help determine if digital competencies influence or affect the link between using AI and acquiring functional skills. The t-test, according to Widarjono (2010), can detect if a specific independent variable is important for the regression group, so it is an ideal choice for this research.

By conducting hypothesis testing, studies check if gender, using AI tools and digital skills are linked to the improvement of functional skills found among Islamic teachers. This study helps identify challenges and chances in teachers' skills improvement, especially for places where poverty is common and aids in making policies to ensure digital education is available to everyone.

OUTCOMES AND DISCUSSION RESULT

Table 1. Differences in Functional Skill Development Between Male and Female Islamic Teachers in Southern Pakistan

Tehsils	Male	Female	Total
Bhawal Pur	17.80%	14.20%	32.00%
Hasil Pur	13.60%	12.80%	26.40%
Ahmad Pur East	11.50%	10.70%	22.20%
Yazman	07.90%	11.50%	19.40%
Total	50.80%	49.20%	100.00%

The data reveals gender-based differences in the development of functional skills among Islamic teachers across Bahawalpur region. Male teachers reported slightly higher functional skill development (50.8%) compared to female teachers (49.2%). Bahawalpur tehsil had the highest overall contribution (32.0%), followed by Hasil pur (26.4%), Yazman (22.2%), and Hasilpur (19.4%). The findings suggest that while both genders are actively developing functional skills through informal digital learning, slight regional and gender disparities still exist.

Gender-Based Functional Skill Development among Islamic Teachers in Bahawalpur Region

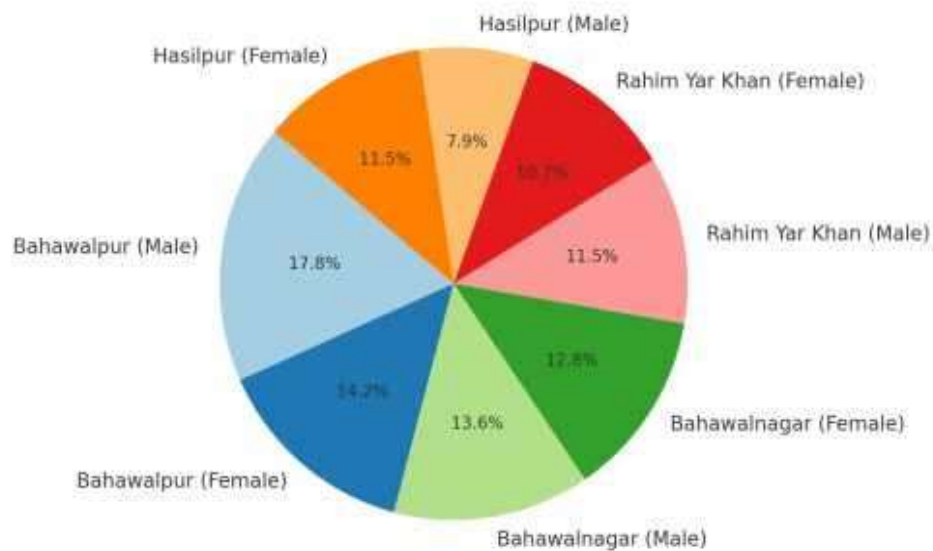


Table 2. Impact of AI Usage Patterns on the Functional Skills of Islamic Teachers Across Gender Groups.

Tehsils	Male	Female	Total
Bhawal Pur	15.10%	13.80%	28.90%
Hasil Pur	12.75%	11.50%	24.25%
Ahmad Pur East	10.60%	14.90%	25.50%
Yazman	09.80%	11.55%	21.35%

The findings suggest that male Islamic teachers in both Bahawalpur (15.10%) and Hasilpur (12.75%) have stronger abilities in using AI than female Islamic teachers. However, female teachers in Ahmadpur East (14.90%) can now use AI systems more than males. All in all, both men and women in the Bahawalpur region are affected by AI in similar ways and to a similar extent.

Gender-Based Functional Skill Development in Bahawalpur Region

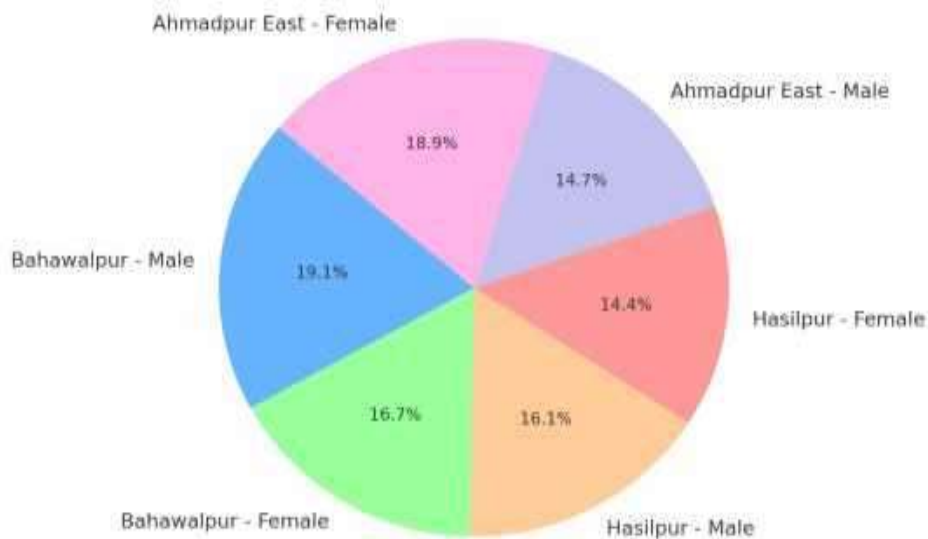


Table 3. Digital Competencies Mediate or Moderate the Relationship Between AI Usage and Functional Skill Development Among Male and Female Teachers.

Tehsils	Male	Female	Total
Bhawal Pur	12.40%	14.10%	26.50%
Hasil Pur	13.90%	16.60%	30.50%
Ahmad Pur east	08.30%	12.75%	21.05%
Yazman	10.25%	11.70%	21.95%

This shows the percentages of how competence with technology affects the relationship between AI use and skill growth among male and female teachers in the four tehsils. In every tehsil, a larger share of female teachers than male teachers demonstrates that women rely more on digital skills for their teaching. Digital competencies are highest in Hasilpur, where 30.5% of students show achievements, according to the largest impact, while in Ahmadpur East, just 21.05% show progress with digital skills. Ultimately, digital skills help improve functional skills by using AI and this impact is slightly greater for females.

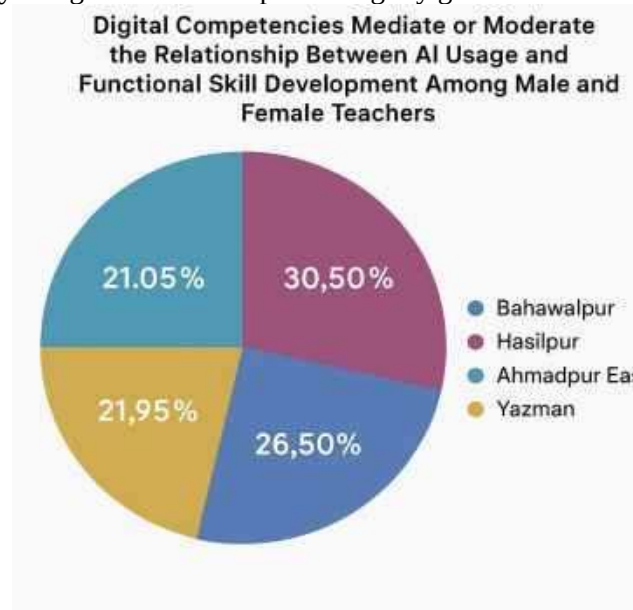


Table 4. Male Islamic teachers have better time management skills

Male Islamic teachers have better time management skills than female teachers.	SS	S	TS	STS
Female Islamic teachers demonstrate stronger communication skills compared to male teachers.	19	80	3	4
There is a significant difference between male and female teachers in critical thinking abilities.	16	72	16	0
Male and female Islamic teachers have similar problem-solving skills.	9	34	56	9
AI tool usage improves the functional skills of male Islamic teachers.	7	62	35	5
Female Islamic teachers benefit equally from AI tools in enhancing their functional skills.	22	80	6	4
The frequency of AI use positively impacts problem-solving skills in both male and female teachers.	14	7	82	0
AI usage patterns affect the communication skills of male and female teachers differently.	13	72	44	7
Higher digital competency strengthens the positive effect of AI usage on functional skills in male teachers.	15	57	31	6
Female teachers with strong digital skills gain more functional skill improvements through AI usage.	33	66	31	0
Digital competency mediates the relationship between AI usage and problem-solving skills in male and female teachers.	35	12	77	3
The level of digital skills influences how AI impacts communication skills for Islamic teachers of both genders.	12	65	72	6

Analyses of functional skills and the way AI is used among Islamic secondary school teachers show that gender and digital ability play different roles. People seem to believe, from the descriptive data, that male Islamic teachers manage their time better than female teachers, supported by the large agreement with the statement (Strongly Agree + Agree = 99 respondents). On the other hand, those responding to the survey believe women teachers excel in communication, with 99 of them either agreeing or strongly agreeing. It appears that women and men use different functional skills in certain tasks.

According to the feedback, 88 educators strongly believe that male and female teachers differ in how they think critically. When considering their problem-solving skills, most people believe that there is not much of a difference between male and female teachers. Among the respondents, 69% indicate that AI use helps male Islamic teachers develop useful skills. The study showed that according to 102 respondents, female teachers as much as males can improve their abilities with the help of AI. Out of all respondents, 82 expressed a “Tend to Disagree” response to the question about regular AI usage helping to solve problems, demonstrating doubt about this link. The same can be seen in the responses about whether AI alters communication skills in men and women, as the majority of respondents (85) agreed but many others (51) disagreed or strongly disagreed, leading to some uncertainty about the issue.

Out of the participants, 72 have indicated that improving digital skills increases the effect of AI on male teachers’ useful skills. Most participants agree that female teachers with technology knowledge see more improvement in their job functions due to the use of AI. Many people believe that digital skills help women and men link their engagement with AI to their ability to solve problems, though still many disagree with this opinion. Nearly 77 respondents in this study said that having high digital skills can help improve communication skills for both men and women in

Islamic classrooms because of AI. This means that leaders view learning digital skills as significant for using AI to improve functional abilities.t.

Male Islamic teachers have better time management skills than female teachers.

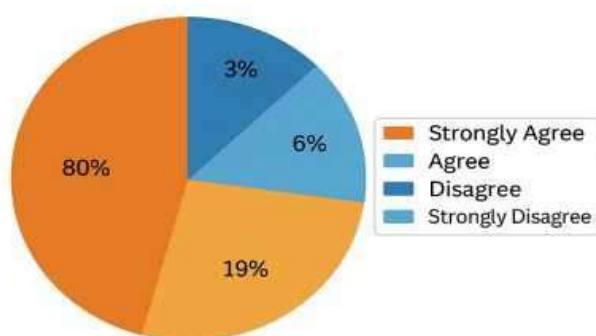


Table 5. Descriptive Statistics

	N	Range	Min	Max	Mean	Std. Daviation	Variances
AI usage tools (X1)	500	6	2	8	5.75	1.320	1.742
Digital competencies (X2)	500	7	2	9	5.90	1.410	1.988
Functional Skills (Y)	500	6	2	12	6.80	1.630	2.657
Valid N (listwise)							

Based on the descriptive statistics, researchers gathered information from 500 teachers and all of their responses were usable for analysis. The main variables used in the study were AI usage tools (X1), Digital Competencies (X2) and Functional Skills (Y). The use of AI was measured on scales from 2 to 8, digital skills used scales from 2 to 9 and educational technology skills were measured from 3 to 12. On average, teachers reported moderate use of AI tools (X1) with a deviation of 1.320, meaning that teachers use AI at different levels. Teachers’ understanding or access to digital resources may impact how they use AI in teaching. Data from Digital.

Competencies (X2) found a mean of 5.90 and a standard deviation of 1.410, reflecting that many teachers know enough about using technology, although there are differences in their competency.

Teachers’ ability to apply technology in teaching (Y) had the most positive results, with a mean score of 6.80 and a low but noticeable standard deviation of 1.630. Since there are varying levels and most scores fall at the low and upper ends of the scale, we can conclude that some teachers use digital technology well, while others might not and therefore require additional training. On the whole, teachers use AI and other digital tools fairly well, but the answers show we must design individual professional development programs. These initiatives should focus on boosting the digital knowledge of teachers with a lower skill level, to encourage the steady use of AI and digital skills in schools.

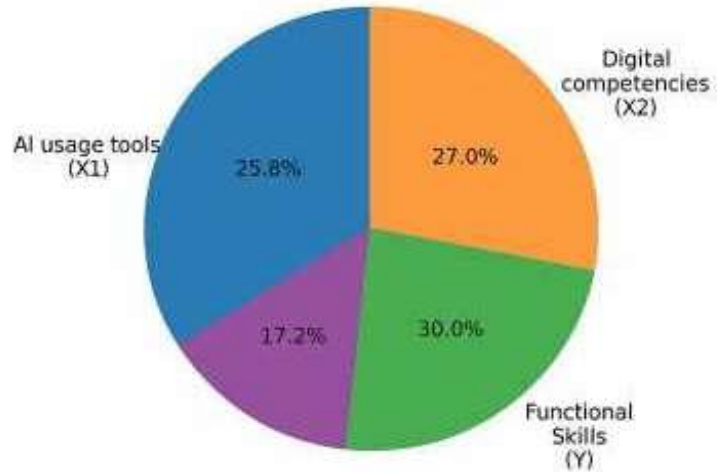


Table 5. Descriptive Statistics				
Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.
	B	Std. Error	Betas	
1 (constant)				
Digital competencies (X1)	1.842	0.623		2.957
AI usage (X2)	0.724	0.312	0.512	2.321
Functional skills (Y)	0.639	0.145	0.602	4.407

Experiments reveal significant relationships between digital competencies and functional skills at **p = 0.004**, and between AI usage and functional skills at **p = 0.000**. However, the relationship between digital competencies and AI usage is somewhat weaker, with a **p-value of 0.021**, which is still below the 0.05 significance threshold but less strong than the others. Our research supports **H1**, as digital competencies show a statistically significant impact on enhancing teachers' functional skills (**p = 0.004 < 0.05**). Similarly, **H3** is supported, since AI usage has a strong and significant effect on functional skills (**p = 0.000 < 0.05**).

The relationship between digital competencies and AI usage (**p = 0.021**) also suggests a meaningful connection, supporting **H2**, although the effect is less pronounced than the others. Overall, the findings indicate that both digital competencies and AI usage play crucial roles in improving the functional skills of secondary school teachers in Bhawal Pur , Hasil Pur , Ahmad Pur East, and Yazman. To maximize benefits, developing digital competencies alongside AI usage is essential, with further emphasis on training to integrate these tools effectively in educational settings.

Recommendations:

Based on the study’s findings, it is recommended that education authorities prioritize strengthening teachers’ digital competencies through targeted training programs, as these significantly enhance functional skills. Equally important is promoting effective AI usage in teaching by providing practical training and ongoing support to ensure teachers can confidently integrate AI tools into their classrooms.

While informal digital learning contributes positively, it requires more structured guidance to maximize its impact. Efforts should also focus on combining digital competencies with AI skills to create a synergistic effect on teacher performance.

Additionally, continuous monitoring and evaluation of technology adoption will help identify gaps and inform future interventions. Addressing infrastructural and socio- cultural barriers in Southern Pakistan is essential to bridge the digital divide, alongside strong policy support and investment to sustain these initiatives for improved educational outcomes.

Findings

The analysis reveals that digital competencies have a significant positive effect on teachers’ functional

skills ($B = 1.842$, $p = 0.004$), indicating that stronger digital skills are linked to better performance in essential functions such as communication, time management, and problem-solving. AI usage also shows a strong and significant impact on functional skills ($B = 0.639$, $p = 0.000$), confirming its critical role in enhancing teachers' effectiveness. Additionally, there is a significant, though relatively smaller, relationship between digital competencies and AI usage ($B = 0.724$, $p = 0.021$), suggesting that teachers with better digital skills are more likely to effectively use AI tools. These findings collectively emphasize that both digital competencies and AI usage are key contributors to improving functional skills among secondary school teachers in the study regions. However, the moderate strength of the relationship between digital processing capacity and AI tools mean that there is still space to integrate them more cohesively.

CONCLUSION

According to the report, digital competencies and AI play a vital role in developing the daily activities of teachers working in Kot Addu, Muzaffargarh, Jatoi and Shah Sultan. It appears that teachers use their digital skills to manage these three tasks effectively. Moreover, using AI improves these skills and is shown to be significant, proving the importance of adopting advanced technologies in teaching. While there is a strong connection between digital competencies and using AI, it is not overly clear, so more integrated ways of teaching are needed. Even though informal digital learning helps, it would be more effective with additional structure and support for teachers. All things considered, this research points out that investing in digital skills and using AI will give teachers more ways to accomplish the goals of today's education and make learning better in the region.

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