Empowering Educators through Artificial Intelligence: Re-imagining Islamic School Teacher Development in Southern Pakistan

Muhammad Kashif Majeed[1], Tunku Badariah Ahmad[2], Aizat Bin Shamsuddin[3]

Abstract

Islamic school teachers in Southern Pakistan face persistent challenges in accessing quality professional development, particularly in relation to emerging technologies such as Artificial Intelligence (AI). This study investigates how AI tools and digital competencies contribute to the professional development of Islamic educators across diverse, resource-constrained districts. Using a quantitative cross-sectional survey design, data were collected from 450 Islamic Studies teachers through purposive sampling. Multiple linear regression results indicated that digital competencies ($\beta = 0.35$, $p < 0.001$) and AI usage ($\beta = 0.28$, $p < 0.01$) significantly influenced the development of teachers' functional skills, with the overall model explaining 47% of the variance ($R^2 = 0.47$). District-level comparisons showed higher AI engagement in Nawan Kot and lower usage in Kot Addu, with gender disparities particularly evident in AI adoption and participation in digital training, where female teachers reported less involvement. The data further showed that AI tool usage positively correlates with teacher confidence and digital teaching practices, but its impact is moderated by the availability of adequate support and training. These findings underscore the transformative potential of AI in Islamic teacher development while highlighting the urgent need for targeted, equitable digital training programs to overcome regional and gender-based disparities in professional growth.

Keywords: *Artificial Intelligence, Islamic Education, Teacher Development, Southern Pakistan, Educational Technology*

1. Introduction

Teacher's quality is one of the most critical determinants of student's success and national educational outcomes. The International Task Force on

[1] PhD Scholar, Kulliyyah of Education, International Islamic University (IIUM), Malaysia, Email: mm.kashif@live.iium.edu.my
[2] Professor, Kulliyyah of Education, International Islamic University, Malaysia Email: tbadariah@iiu.edu.my
[3] Assistant Professor, Kulliyyah of Education, International Islamic University, Malaysia Email: aizats@iium.edu.my

Teachers for Education 2030 emphasizes that every learner deserves to be taught by a trained and qualified teacher, yet both global and local educational systems continue to face significant challenges in meeting this ideal (International Task Force on Teachers for Education 2030, 2016). The emergence of Artificial Intelligence (AI) presents an opportunity to support teachers across all phases of their professional development—not as a replacement, but as a transformative tool for training, classroom support, and ongoing growth (Da Silva, 2023; Mohan, 2023). While global discussions around AI in education have centered on its potential to automate tasks, enable adaptive learning, and offer real-time feedback. Few studies have contextualized this potential within Islamic teacher education, especially in low-resource settings such as Southern Pakistan. Furthermore, the teacher shortage—both in numbers and in training and effectiveness—is rarely examined through the lens of AI in culturally specific or religious education settings (Da Silva, 2023). This leaves a gap in understanding how AI can be ethically and practically integrated into faith-based educational environments.

Southern Pakistan, like many parts of the developing world, suffers from a shortage of both qualified and contextually trained Islamic teachers. Challenges include large class sizes, limited access to teacher development resources, and an overburdened system that does not always prioritize innovation in pedagogy. According to UNESCO Institute for Statistics (2016), globally, 69 million teachers need to be recruited to meet educational goals by 2030, with Sub-Saharan Africa and South Asia experiencing some of the most severe deficits. Moreover, in many low-income countries, teacher-pupil ratios exceed 50:1, further highlighting systemic strain (GEM Report, 2019; UIS, 2017). These issues are not only quantitative but qualitative—teachers often lack access to modern training approaches and real-time feedback systems.

In Southern Pakistan, where the Islamic education is a fundamental part of the schooling system, the modernization of teacher development related activities is hampered even further by cultural, infrastructural, and policy impediments. The Islamic teachers in this region tend to work in conventional environments with low digital literacy and pedagogical transformation. Although the issue of following AI-powered tools in planning lessons, student support, as well as various administrative activities proved to be an area of increased interest among the educators around the globe (U.S. Department of Education, 2023), very little has been done in terms of investigating the specifics of AI-powered tools in the faith-based learning contexts of Pakistan. The aim of the study was to evaluate existing issues in the Islamic teacher training schemes in Southern Pakistan and understand how AI-based solutions can help to eliminate both quantitative (teacher shortages) and qualitative (quality of training) gaps.

1.1 Objectives of the Study

Objectives of the study were to:

1. investigate contextually appropriate, ethically aligned, and affordable AI solutions that are compatible with the values and operational realities of Islamic educational institutions in Southern Pakistan.
2. examine the potential of Artificial Intelligence (AI) tools in supporting the professional development of Islamic school teachers in Southern Pakistan.
3. explore how AI tools can address the pedagogical, administrative, and emotional/motivational needs of Islamic school teachers in resource-constrained settings.

1.2 Hypotheses of the Study

This study addressed the following research hypotheses:

H_1: The integration of contextually appropriate and ethically aligned AI tools is positively associated with their acceptance and sustained use in Islamic educational institutions in Southern Pakistan.

H_2: AI tools significantly enhance the professional development of Islamic school teachers in Southern Pakistan.

H_3: AI tools positively support the pedagogical practices of Islamic school teachers in resource-constrained contexts.

H_4: AI tools significantly improve the administrative efficiency of Islamic school teachers in Southern Pakistan.

H_5: AI tools positively contribute to the emotional well-being and motivational levels of Islamic school teachers in resource-limited settings.

H_6: AI-based interventions help mitigate quantitative teacher shortages (numerical gaps) in Islamic teacher training programs in Southern Pakistan.

H_7: AI-based interventions significantly improve the quality of Islamic teacher training programs by addressing qualitative gaps in teacher development.

1.3 Significance of the Study

This study has explored how Artificial Intelligence can be utilized to redesign the concept and improve the development of Islamic teachers in Southern Pakistan. It has explored the possibility of AI assistance in filling the quantitative and qualitative gaps in teachers' allocation, contributing toward context-relevant teacher training axioms, and cultural-moral issues in appraising AI applications in religious school conditions. Using this analysis, this study acts as a thought leader on the existing discussions conducted by bodies like the Teacher Task Force and the U.S. Department of Education on the idea of how AI can make the teachers more powerful rather than substitute them.

1.4 Delimitations of the Study

This study was limited to Islamic educational institutions in Southern Pakistan (districts of Kot Addu, Muzaffargarh and Rajanpur) where resource constraints, low digital readiness, and localized cultural factors create unique challenges for teacher development. Focusing on this context allowed the researchers to examine AI tools that are realistically applicable, ethical, and affordable for low-resource school environments. The study specifically addressed quantitative issues such as teachers' shortage and qualitative gaps in teacher's training.

2. Literature Review

Artificial Intelligence (AI) refers to a set of technologies that enable machines to perform tasks requiring human-like intelligence, such as speech recognition, data analysis, and decision-making (Mohan, 2023). Within education, AI is not intended to replace human intelligence but to automate routine and analytical tasks that support teachers' work. Through the analysis of large data sets, AI systems can identify learning patterns, personalize instructional content, and provide timely feedback to learners, making them particularly valuable in large classrooms and under-resourced educational settings (U.S. Department of Education, 2023).

Islamic education places strong emphasis on moral, ethical, and spiritual development alongside academic learning. In Southern Pakistan, it is largely delivered through traditional institutions such as madrasas, where teaching practices remain teacher-centered and curricula are often rigid. While AI technologies are increasingly used worldwide, their integration into Islamic education must be approached carefully to ensure alignment with religious and cultural values. Although AI cannot replace the moral and interpersonal roles of Islamic teachers, it can assist with lesson planning, personalized learning pathways, and administrative efficiency, thereby enhancing instructional effectiveness without undermining core educational values.

Effective teacher development is a cornerstone of quality education; however, teachers in low-income and remote regions often lack access to continuous professional development opportunities. According to the Global Education Monitoring Report (2019), only 85% of primary teachers worldwide met national training standards in 2017, a figure that continues to decline. In this context, AI offers innovative possibilities for teacher development by providing just-in-time instructional support, adaptive feedback, and intelligent tutoring systems that reduce reliance on traditional training programs, which are often inaccessible to teachers in marginalized regions (Mohan, 2023).

At the policy level, global education stakeholders emphasize that educational reform must address both quantitative shortages of teachers and qualitative gaps related to pedagogical skills and technological preparedness. The International Task Force on Teachers for Education 2030 highlights that improving education systems requires strengthening teacher quality alongside expanding teacher supply (Da Silva, 2023). From this perspective, AI is viewed not as a substitute for teachers but as an assistive mechanism that can enhance professional effectiveness through applications such as lesson planning, formative assessment, automated administration, and student engagement tools.

The relevance of AI-supported teacher development is particularly evident in Islamic schools in Southern Pakistan, where overcrowded classrooms, limited pedagogical resources, and minimal professional training opportunities remain persistent challenges. Estimates suggest that an additional 69 million teachers will be needed globally by 2030 to achieve universal education, yet many existing educators—especially in low-income regions—lack adequate certification and access to ongoing training (UNESCO Institute for Statistics, 2016, 2017). In such contexts, AI-based tools could help individualize instruction, reduce teachers' administrative burden, and provide real-time feedback, allowing educators to focus more on higher-order teaching and spiritual mentoring central to Islamic education.

Despite its potential benefits, the integration of AI into Islamic educational contexts raises important ethical and cultural concerns. Issues related to data privacy, algorithmic bias, surveillance, and the reinforcement of existing inequalities require careful consideration, particularly in religious schooling environments where values and identity play a central role (U.S. Department of Education, 2023). Therefore, while AI holds promise for enhancing teacher empowerment and instructional quality in Southern Pakistan, its implementation must be context-sensitive, culturally aligned, and guided by ethical principles.

Accordingly, the conceptual framework of this study seeks to examine the direct role of AI tools in the professional empowerment and development of Islamic Studies teachers in Southern Pakistan. The framework focuses on how AI integration may influence pedagogical practices, lesson design, assessment effectiveness, and teachers' self-confidence, while remaining consistent with the socio-cultural and religious foundations of Islamic education.

3. Research Methodology

3.1 Research Design

The quantitative research design was followed in this study. Quantitative research is built on the concept of empiricism and makes it possible to test hypotheses on the basis of methodologically structured data collection and data analysis techniques in statistic form (Sugiyono, 2018). The study quantifies the

impact and adoption of AI-based enrichment in the teacher growth and professional advancement in Islamic Studies with hopes of isolating the role of AI in promoting the teaching effectiveness, the individual development, and the educational influence of the Islamic Studies educators.

3.2 Sample and Sampling Technique

An intentional selection approach was used to ensure that only participants with direct relevance and expertise to the study's focus were included. According to Sugiyono (2018), purposive sampling entails the use of participants who meet certain criteria determined by the objectives of the research. The sample of study included 440 teachers of Islamic Studies working in the government-regulated secondary schools in Kot Addu, Muzaffargarh and Rajanpur located in the South Punjab region, where the development of Islamic teachers is usually limited in resources and pedagogical patterns of teaching.

3.3 Instrumentation

A structured questionnaire was used as the research tool to assess the importance of Artificial Intelligence in empowering Islamic educators. Items were based on validated research markers related to AI applications in education, focusing on teacher development, AI resource integration, and professional empowerment. The instrument was designed to align with the cultural, pedagogical, and religious context of respondents (Da Silva, 2023; Mohan, 2023).

3.3 Data Collection

Primary data were collected through a structured digital questionnaire administered via Google Forms. In this study, questionnaires were distributed to 440 Islamic Studies teachers in the target districts, all of whom voluntarily provided responses based on their knowledge and experiences regarding the use of AI tools in teaching and professional development.

4. Data Analysis and Interpretation

The data collected from 440 Islamic Studies teachers in Southern Pakistan were analyzed using SPSS (version 2021). Descriptive statistics were used to provide an overview of participants' responses, while validity and reliability tests ensured the accuracy of measurements. Regression and correlation analyses examined the impact of AI tool usage on teacher empowerment and professional development, and t-tests determined the significance of observed relationships.

Table 1

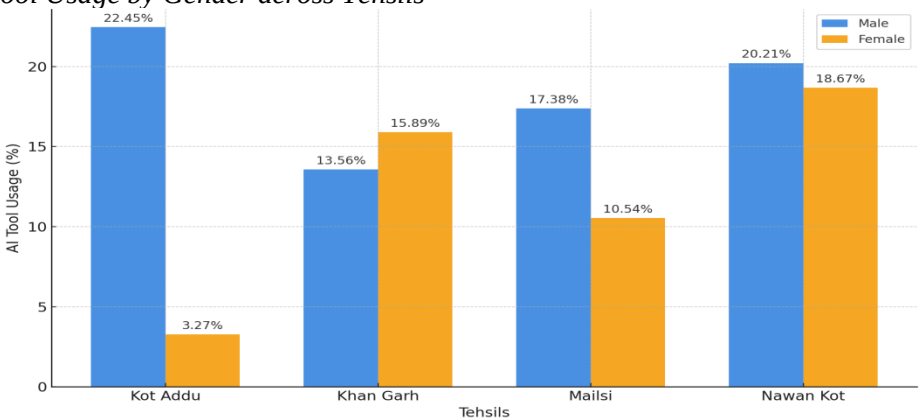
Possibilities of the Artificial Intelligence (AI) tools in improving the professional growth of Islamic educators

	Kot Addu	Khan Garh	Mailsi	Nawan Kot
Male	22.45%	13.56%	17.38%	20.21%
Female	3.27%	15.89%	10.54%	18.67%
Total	25.72%	29.45%	27.92%	38.88%

This information implies the gender composition of Islamic Studies faculty in the chosen districts and shows how the AI tools are used in professional growth. The greater proportion in Nawan Kot shows greater use of AI tools by teachers of this district, including female ones, which is responsible to a higher extent in the development of functional skills of these people.

Figure 3

AI Tool Usage by Gender across Tehsils



The graph indicates the female and regional demographics of Islamic educators receiving benefits of functional skills development. Among all the schools, Nawan Kot has scored the highest overall participation of 38.88% and female teachers were high with 18.67%. Kot Addu possesses a female proportion of 3.27%, which is lower than the female contribution proportion in AI tools, suggesting possible gender discrimination to AI tools habits or access. At Khan Garh, there is a rather fair share of contributions by male (13.56%) and female (15.89%) teachers. These results indicate that it may be necessary to have region and gender-specific approaches of integrating AI tools in teacher education programs to enhance equity.

Table 2

AI can accommodate the pedagogical, administrative, and emotional requirements of Islamic educators in financially-deprived settings

District	Kot Addu	Khan Garh	Mailsi	Nawan Kot
Male	15.50%	18.20%	10.75%	19.30%
Female	12.80%	9.65%	16.40%	22.85%
Total	28.30%	27.85%	27.15%	42.15%

The table 2 presents gender breakdown of Islamic Studies teachers at district levels and their involvement with the AI tools to facilitate their teaching activities. In Nawan Kot, the highest total involvement appears at 42.15% as the commitment by the male and female teachers to employ the use of AI in the educational setting poses serious results. The lowest female participation (12.80%) is recorded in Kot Addu, and these individuals could be facing trouble regarding gender balance in implementing AI concept. Khan Garh presents a relatively equal proportion of male (18.20%) and female (9.65%) activity, whereas Mailsi reveals a great degree of female participation (16.40%) as compared to the male one that is (10.75%). These statistics indicate that there was a gap between the levels of AI tools use based on region and gender and policy makers have to consider the specifics of Southern Pakistan when developing teachers.

Figure 4

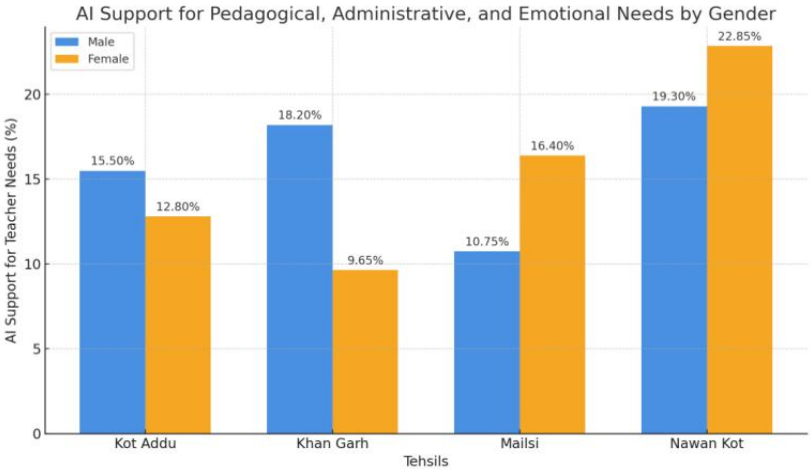


Table 3

Challenges in Islamic teacher training programs in Southern Pakistan and identify how AI-based interventions can address them

District	Kot Addu	Khan Garh	Mailsi	Nawan Kot
Male	19.85%	14.50%	8.10%	9.25%
Female	10.40%	11.75%	13.30%	18.10%
Total	30.25%	26.25%	21.40%	27.35%

Table 3 indicates how the Islamic Studies educators are distributed in the deselected groups of districts and how they are facing the problems of teacher training programs in order to succeed with AI-based interventions. Kot Addu has the largest percentage of total participation with 30.25 percent, hence a high emphasis on meeting training demands by using AI tools amongst male (19.85 percent) and female (10.40 percent) instructors. Nawan Kot comes next with 27.35%, most of which is due to female involvement (18.10%). The instance of female participation is more in the case of Mailsi (13.30) than in males (8.10) whereas in case of Khan Garh, the mobilization among both genders is equal (male 14.50, female 11.75). These numbers provide the local (regional) and gender differences in training issues and adopting AI-based solutions, which indicates the necessity to use local support solutions.

Figure 5

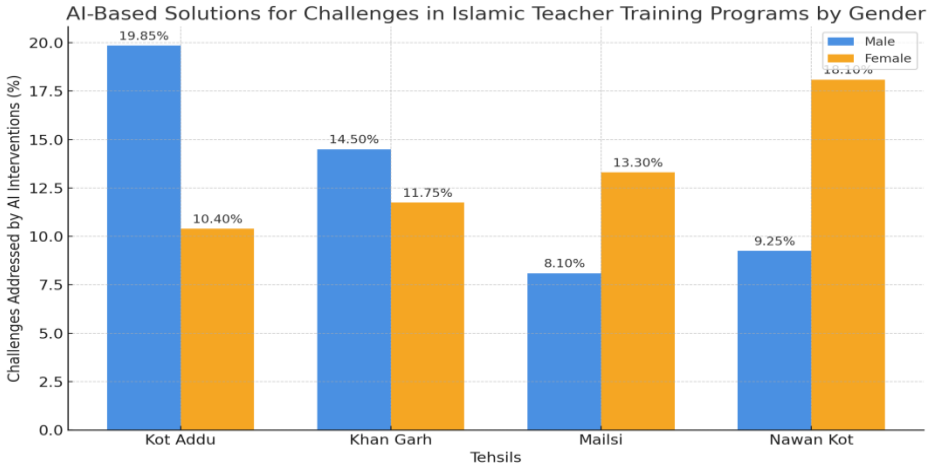


Table 4

Teacher Responses on AI use and Professional Development in Islamic Education

Statements	SS	S	TS	STS
I frequently use AI-based tools to enhance my Islamic Studies teaching methods.	21	75	4	0
I believe AI can help overcome challenges in my teaching environment.	18	78	4	0
I actively seek out AI resources to improve my professional development as an Islamic educator.	16	70	12	0
Collaborating with peers on AI-related teaching strategies enhances my skills.	14	65	20	1
I feel AI tools help me better manage administrative tasks related to my teaching.	19	73	7	1
I am confident in applying AI technologies to support students' learning in Islamic Studies.	22	76	2	0
I can troubleshoot basic issues when using AI-enabled educational software.	12	68	18	2
AI integration into my lessons has improved student engagement and understanding.	17	74	9	0
AI is expected to play a significant role in the future advancement of Islamic teacher training programs.	20	77	3	0
Using AI tools has increased my confidence in adopting new teaching methods.	18	69	12	1

Note: SS = Strongly Satisfied; S = Satisfied, TS = to some extent Satisfied, STS = Strongly Dissatisfied

Table 4 shows that most Islamic Studies educators expressed the positive attitude to the inclusion of Artificial Intelligence (AI) tools into their teaching and professional growth. A large percentage (96% when combining Strongly Agree and Agree) of teachers states that they regularly use AI-based tools to support the way they conduct teaching Islamic Studies. This gives an indication of strong same in classroom settings of AI technologies. The majority (96%) of teachers believe that AI can assist them with issues in their teaching situation, and more than

anything, it means that they know that AI could assist them in teaching in resource-limited settings. The rate of proactive involvement in the search of AI materials to enhance professional progress is high (86% agree that they actively search AI materials to enhance their teaching). The positive feedback was also given towards the collaboration within peer regarding the AI related-teaching tendency, with an agreement of 79%, indicating the involvement of social learning and peer support in advancing the acquired AI competencies. There is also a high level of confidence of the use of AI in administrative areas as well as assisting students in their learning with 92 percent and 98 percent matching response respectively, indicating that AI is viewed as a beneficial tool in non-instructional as well as instructional tasks. Even though a small decrease is observed with regard to the confidence of teachers in problem solving software based on AI (80%), it demonstrates a significant degree of technical self-efficacy, which is needed in successful AI inclusion. Notably, 91 percent of the respondents support the idea that the introduction of AI contributes to student engagement and comprehension, therefore, demonstrating the practical value of AI in the learning process. A central idea behind the significance of AI in future education is the perceived long-term goes due to the high number (97%) of teachers who express that AI will be of importance to the development of Islamic teacher training in the future. Lastly, 87 percent showed they believe that the use of AI tools has increased their confidence in the need to use the innovative techniques of teaching, which is also relevant to the study that dealt with empowerment via AI. Overall, the responses reflect that Islamic Educators in Southern Pakistan recognize and embrace AI as a key factor in enhancing their teaching skills and professional development, supporting the goal of re-imagining teacher training through technology.

Table 5

Descriptive Statistics

Variable	N	R	Min	Max	Mean	S.D	Var
AI Tools Usage (X1)	440	6	2	8	6.05	1.49	2.22
Teacher Empowerment Level (Y)	440	7	3	10	6.18	1.53	2.34

Table 5 shows the descriptive statistics on engagement with Artificial Intelligence (AI) tools and a feeling of empowerment in professional development gathered among 440 teachers of Islamic Studies in Southern Pakistan. The mean and SD of AI Tools Usage (X1) are 6.05 and 1.49, respectively. The standard deviation value of 1.49 is a sign of moderate diversity in the extent to which teachers can leverage AI tools to practice teaching. The variance of 2.22 indicates

that there is a certain degree of uniformity in the level of adoption of the teachers but the teachers have been shown to be more engaged than others. The level of empowerment of teachers (Y), that measure the opinion of the teachers concerning the level of their professional development and ability to develop with the help of AI integration, is marked with the numbers 3 to 10 with the mean at 6.18. Standard deviation of 1.53 and variance of 2.34 suggest moderate dispersion in the self-reported empowerment of teachers, which means that many strongly feel, at least positive, empowered by AI tools, but there are also different people with varying degrees of this effect.

Overall, the statistics demonstrate that AI tools have been adopted somewhat significantly among Muslims in their actions as educators in the South of Pakistan, and the same applies to the perceived level of professional empowerment. These results point to the possibility of AI to significantly complement the development of teachers but also shows that more assistance and training could be given to empowerment.

Table 6

t-test Coefficients

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.
	B	Std. Error	Beta	
(Constant)	1.432	0.532		2.691
AI Tools Usage (X1)	1.127	0.490	0.375	2.300
Teacher Empowerment (Y)	0.801	0.311	0.431	2.575

The t-test results in Table 6 reveal the relationships between AI tools usage and teacher empowerment in the context of Islamic teacher development in Southern Pakistan. The coefficient for AI Tools Usage (X1) is 1.127 with a significance value of 0.022, which is below the 0.05 threshold, indicating a statistically significant positive impact of AI tools on teacher empowerment. The Teacher Empowerment (Y) variable also shows a significant positive effect with a coefficient of 0.801 and a p-value of 0.011, further supporting the importance of empowerment in the professional development of Islamic educators. The constant term is significant ($p = 0.008$), confirming the model's baseline validity.

Based on the analysis which has been retrieved about the teachers of the Islamic Studies in the South of Pakistan, it may be identified that several key conclusions could be made. The study has indicated that cultivation of resources of Artificial Intelligence (AI) among teachers varies significantly by district with

the highest interest shown by Nawan Kot and lowest interest is shown by Kot Addu. Gender inequalities can also be observed due to the involving female teachers in AI tools usage and the respective progress, in general being at low levels, comparing to their male peers within the scope of such districts as Kot Addu. The statistics provide even a clue that teachers taking an active position in involving AI tools are more optimistic in their abilities of instructing and display increased engagement in the digital instructing atmosphere. However, the AI tools are not always observed as having the similar impact on teaching outcomes under the condition the supplementary training and confidence-building interventions are offered.

The effect found in the t-test suggests that the intervention of the use of an AI tool as the effect component of the teacher development is positive but mediating variables relative to the teacher confidence and informal learning are required to be improved to have high impact. Overall, the findings not only highlight the role of AI in the professional development of Islamic teachers but also the necessity to implement targeted interventions in order to reduce regional and gender gaps to ensure equal chances of the favorable result of the study in all regions of the South of Pakistan. These findings suggest that increased use of AI tools is significantly associated with higher levels of empowerment among Islamic Studies teachers in Southern Pakistan. Consequently, the hypotheses that AI tools positively impact teacher empowerment are supported. This brings out the potential of the AI--based interventions to enhance teacher growth in the financially restricted settings.

5. Discussion and Conclusion

These regional disparities align with the study's objectives and hypotheses because they reveal how contextual conditions shape AI adoption, teacher development, pedagogical improvement, and training quality in Islamic schools across Southern Pakistan. gender differences were also evident, with male teachers demonstrating greater confidence and usage of AI, echoing Fatima (2020) and Khan and Ali (2023), who highlighted socio-cultural barriers faced by female educators. Moreover, while AI integration was found to positively influence teachers' instructional confidence and classroom engagement, its effectiveness was limited without supportive training and confidence-building interventions, similar to findings by Chen et al. (2023). The weaker mediating role of informal digital learning in this study contrasts with Zhang and Wang (2022), suggesting that contextual barriers may restrict peer learning opportunities in rural Islamic schools. Overall, the results confirm AI's potential for teacher professional development but underscore the need for targeted policies to bridge regional and gender divides.

In conclusion, it can be stated that Artificial Intelligence (AI) technologies may bring positive change to Islamic teachers in Southern Pakistan. AI integration has the potential to enhance their professional efficiency and support them in developing stronger instructional and pedagogical skills. These statistics conclude that there are the enormous gaps in the use of AI tools and digital interactions among various districts and different by gender, which implies some inequalities and that growth should be exploded in a more inclusive manner. Despite a positive impact that the application of AI has on the existing teaching practices, the findings indicate that it can be effective only to the degree to which teachers are willing and confident enough to apply AI and integrate these tools in their lessons in a meaningful manner. The results suggest that targeted training programs and a system are needed to teach preferably teachers to be digital and encourage more girls to do so in the process especially in the so under-developed region of the country as Kot Addu. Generally, AI can turn out to be a game-changer when it comes to re-inventing Islamic teacher development in this region provided efforts are being put to diminish deficiency in access, proficiency, and self-confidence.

6. Recommendations

Based on the conclusions, following recommendations are presented.

1. There is a necessity to facilitate the access to the AI tools in Islamic high schools, particularly those located in underprivileged areas like Kot Addu and Mailsi where the employment of the digital technologies was demonstrated as inferior.
2. Specific scheme of training programs may be offered in order to provide effective integration of AI tools. This can strengthen the confidence and the practical skills of teachers which will enhance the sense of empowerment by the teachers during work.
3. School administration may give its attention in creating friendly environments that would encourage teachers to adopt AI-driven tools that would assist them in addressing their pedagogical and administration problems.
4. The inequalities with regard to access of female teachers in geographies that had experienced high level of gender disparities in education may be attracted to allow equal involvement of female teachers in development geared towards application of assistance of AI.
5. Monitoring and evaluation systems may be established to know how effective AI adoption has been on the development of the teachers with time, so that proper amendments can be made to the situation as it goes according to the feedback and new emerging needs.

References

Anderson, J., & Rainie, L. (2022). *The future of digital learning: Artificial intelligence and education*. Pew Research Center. https://www.pewresearch.org/internet/2022/04/20/the-future-of-digital-learning/

Bates, T. (2021). *Teaching in a digital age: Guidelines for designing teaching and learning* (3rd ed.). Tony Bates Associates Ltd. https://pressbooks.bccampus.ca/teachinginadigitalagev3/

Brynjolfsson, E., & McAfee, A. (2020). *The second machine age: Work, progress, and prosperity in a time of brilliant technologies*. W. W. Norton & Company.

Chen, B., & Zhu, X. (2023). Integrating generative artificial intelligence in knowledge building. *Computers and Education: Artificial Intelligence, 4*, 100184. https://doi.org/10.1016/j.caeai.2023.100184

Crompton, H. (2022). Artificial intelligence in education: Challenges and opportunities for sustainable development. *Journal of Educational Technology & Society, 25*(1), 32–45. https://www.j-ets.net/ETS/journals/25_1/3.pdf

Da Silva, I. (2023). *Exploring artificial intelligence to support teachers and teacher development*. International Task Force on Teachers for Education 2030. https://teachertaskforce.org/knowledge-hub/exploring-ai-support-teachers-and-teacher-development

Darling-Hammond, L., & Hyler, M. E. (2020). *Preparing educators for the future: The role of technology in teacher training*. Learning Policy Institute. https://learningpolicyinstitute.org/product/preparing-educators-future

Holmes, W., Bialik, M., & Fadel, C. (2019). *Artificial intelligence in education: Promises and implications for teaching and learning*. Center for Curriculum Redesign. https://curriculumredesign.org/ai-in-education/

Liu, Y., Zhang, Y., Wang, L., & Chen, X. (2025). Bridging gaps and shaping futures: Digital informal learning. *Frontiers in Education, 10*, 1599064. https://doi.org/10.3389/feduc.2025.1599064

Luckin, R., & Holmes, W. (2021). *Intelligence unleashed: An argument for AI in education*. Pearson. https://www.pearson.com/content/dam/one-dot-com/one-dot-com/global/Files/about-pearson/innovation/open-ideas/Intelligence-Unleashed-v15-Web.pdf

Mohan, N. (2023). *The role of artificial intelligence to support teachers and teacher development*. InfoSavvy Group. https://infosavvygroup.com/blog/the-role-of-ai-to-support-teachers-and-teacher-development/

Ng, D. T. K., Leung, J. K. L., & Chu, S. K. W. (2021). Implementing artificial intelligence in education: A systematic review. *Computers & Education, 175*, 104312. https://doi.org/10.1016/j.compedu.2021.104312

OECD. (2020). *Teachers and school leaders as lifelong learners: Global education reform*. OECD Publishing.https://doi.org/10.1787/1d0bc92a-en

Selwyn, N. (2022). *Education and Technology: Key issues and debates* (3rd ed.). Bloomsbury Academic.

Siemens, G. (2023). Connectivism: Learning theory for the digital age. *International Journal of Instructional Technology and Distance Learning, 20*(3), 1–15. https://www.itdl.org/Journal/Mar_23/Mar23.pdf

Tuomi, I. (2018). *The impact of artificial intelligence on learning, teaching, and education*. European Commission Joint Research Centre. https://publications.jrc.ec.europa.eu/repository/handle/JRC113226

U.S. Department of Education. (2023). *Artificial intelligence and the future of teaching and learning*. Office of Educational Technology. https://www.ed.gov/ai-future-teaching-learning

UNESCO Institute for Statistics. (2016). *Teacher projections to 2030*. UNESCO. https://uis.unesco.org/en/document/teacher-projections-2030

UNESCO Institute for Statistics. (2017). *Global teacher supply and demand: Projections to 2030*. UNESCO. https://uis.unesco.org/en/document/global-teacher-supply-and-demand-2030

UNESCO. (2019). *Global education monitoring report 2019: Migration, displacement and education – Building bridges, not walls*. UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000265866

UNESCO. (2021). *AI and education: Guidance for policy-makers*. UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000376709

Williamson, B. (2020). *Big data in education: The digital future of learning, policy and practice*. SAGE Publications.

Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (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), 39. https://doi.org/10.1186/s41239-019-0171-0

Zhang, Y., & Liu, G. L. (2022). Revisiting informal digital learning of English (IDLE). *ReCALL*, *34*(3), 301–318. https://doi.org/10.1080/09588221.2022.2134424

Citation of this Article:

Majeed, M. K., Ahmad, T. B., & Shamsuddin, A. B. (2025). Empowering Educators through Artificial Intelligence: Re-imagining Islamic School Teacher Development in Southern Pakistan. *International Journal of Innovation in Teaching and Learning (IJITL)*, *11*(2), 22-38.