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ENHANCING TEACHERS' FUNCTIONAL SKILLS THROUGH ENGLISH LANGUAGE AND CULTURAL EXPOSURE USING AI AND DIGITAL INFORMAL LEARNING IN SOUTHERN, PAKISTAN

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Abstract

In the digital age, educators must continuously adapt their functional skills to meet evolving classroom and communication demands. English language proficiency and cultural understanding are increasingly essential for teachers in multilingual and multicultural environments. Artificial Intelligence (AI) and digital informal learning have emerged as innovative tools to support this development, especially in underserved educational settings.Despite growing interest in AI in education, limited studies focus on how AI and informal digital platforms collectively contribute to English language acquisition, cultural awareness, and overall functional skills development among teachers, particularly in Islamic secondary schools in Southern Pakistan.The study is a quantitative experiment which examines how AI tools can help to improve the knowledge of English language, how digital informal learning leads to cultural awareness and how both can contribute to the development of functional skills wielded by teachers. The representative selection of 450 teachers in the Islamic secondary schools was chosen subserviently. An analysis of such data was undertaken by means of a structured questionnaire and SPSS (2021) using descriptive statistics and independent sample t-tests. The results demonstrate that AI-based tools are extremely helpful regarding the learning of the English language, and informal digital platforms increase the level of intercultural sensitivity in teachers. These are combined to have a positive contribution in the development of key functional skills like communication, critical thinking and problem solving. The research promotes changes to the education policy that should embrace AI and digital resources within the teacher development plans. It offers critical information to policymakers, educational leaders, and developers of EdTech who would wish to enable linguistically and culturally diverse areas teachers.

Keywords: Artificial Intelligence; English language acquisition; digital ludic learning; cultures awareness; useful skills; Islamic schools; teacher education; Southern Pakistan

Abstrak

Di era digital, pendidik harus terus-menerus menyesuaikan keterampilan fungsional mereka untuk memenuhi tuntutan kelas dan komunikasi yang terus berkembang. Kemahiran berbahasa Inggris dan pemahaman budaya semakin penting bagi guru di lingkungan multibahasa dan multikultural. Kecerdasan Buatan (AI) dan pembelajaran informal digital telah muncul sebagai alat inovatif untuk mendukung perkembangan ini, terutama di lingkungan pendidikan yang kurang terlayani. Meskipun minat terhadap AI dalam pendidikan semakin meningkat, studi yang terbatas berfokus pada bagaimana AI dan platform digital informal secara kolektif berkontribusi pada pemerolehan bahasa Inggris, kesadaran budaya, dan pengembangan keterampilan fungsional secara keseluruhan di kalangan guru, khususnya di sekolah menengah Islam di Pakistan Selatan. Studi ini merupakan eksperimen kuantitatif yang meneliti bagaimana alat AI dapat membantu meningkatkan pengetahuan bahasa Inggris, bagaimana pembelajaran informal digital mengarah pada kesadaran budaya, dan bagaimana keduanya dapat berkontribusi pada pengembangan keterampilan fungsional yang dimiliki oleh guru. Pemilihan representatif sebanyak 450 guru di sekolah menengah Islam dilakukan secara selektif. Analisis data tersebut dilakukan dengan menggunakan kuesioner terstruktur dan SPSS (2021) menggunakan statistik deskriptif dan uji-t sampel independen. Hasil penelitian menunjukkan bahwa alat berbasis AI sangat membantu dalam pembelajaran bahasa Inggris, dan

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platform digital informal meningkatkan tingkat kepekaan antarbudaya pada guru. Kombinasi ini memberikan kontribusi positif dalam pengembangan keterampilan fungsional utama seperti komunikasi, berpikir kritis, dan pemecahan masalah. Penelitian ini mendorong perubahan kebijakan pendidikan yang seharusnya merangkul AI dan sumber daya digital dalam rencana pengembangan guru. Penelitian ini menawarkan informasi penting bagi para pembuat kebijakan, pemimpin pendidikan, dan pengembang EdTech yang ingin memberdayakan guru di berbagai wilayah dengan latar belakang linguistik dan budaya yang beragam.
Kata Kunci: *Kecerdasan Buatan; penguasaan bahasa Inggris; pembelajaran ludis digital; kesadaran budaya; keterampilan yang berguna; sekolah Islam; pendidikan guru; Pakistan Selatan*

INTRODUCTION

In the current education system characterized by high technology and globalization, teachers have to be more equipped with good functional skills particularly, communication, thinking, and cultural knowledge to enable them to stay functional. With the incorporation of Artificial Intelligence (AI) and digital informal learning, there emerges a prospect of the advancement of these necessary abilities, especially in underprivileged educational settings (Almusharraf & Almusharraf, 2021). Learning the English language and exposure to the culture is becoming very critical to teachers to cope up with various classroom dynamics and global standards in pedagogy. AI technologies transform the education industry by allowing personalized learning, auto feedback, and transformative delivery of the content (Zawacki-Richter et al., 2020). In a parallel fashion, the digital informal learning, or learning through non-conventional digital means (YouTube, podcasts, online communities, mobile applications, etc.) has emerged as an effective channel of teacher professional development (Chen et al., 2021). The mentioned digital devices may become impetuses to becoming more proficient in language and more culturally conscious, which are key features that allow becoming a better teacher as a whole.

Although there has been a rising trend in the research concerning the area of AI in education, little has been done in regards to how AI and digital informal learning aid teachers in developing functional skills among these teachers defining their overall performance in Islamic secondary schools, based on the Southern province of Pakistan. The available literature is mostly preoccupied with either teaching outcomes or with assigned formal professional development (Wang et al., 2021), and thus there was a lack of awareness about the role of informal, AI-assisted learning in developing the competencies of teachers. Educators within Islamic secondary schools cannot readily access a formal language and cultural instruction course. This reduces their ability to interact with different learners and embrace new idea of teaching. These functional gaps in skills urgently demand the need to investigate smaller, large-scale, technology-based interventions, such as AI and online informal education, which might assist in filling these gaps without applying only conventional instructional paradigms.

The efficiency of AI and informal digital means in enhancing language learning and intercultural competence as well as teaching performance is confirmed in recent studies (Nguyen et al., 2022; Al-Fadhli, 2021). But these are largely generalized to be in the urban well-endowed contexts and do not derive the picture to rot about the rural or the religious-based schooling institutions. The educational problem in southern Pakistan especially in Kot Addu and Muzaffargarh region is somewhat different: there is the lack of teacher training facilities, language barrier, and little experience with international cultures. Teachers of Islamic secondary school in this case tend to use the traditional approaches to teaching and have very fewer chances to develop professionally with the help of organized ways. The possible benefits of introducing AI tools and fostering digital informal educational experiences are the availability of low-cost, flexible ways to increase their functionalities. To investigate the use of AI in the acquisition of English language among the teachers. The key objective held by this paper is to consider how learning tools based on machine-learning principles and digital informal learning practices contribute to the development of

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English proficiency, cultural knowledge, and core functional skills among teachers in Islamic schools in Southern Pakistan. The research offers evidence-based findings to be used to make policy decisions and teacher training programs in low-income areas.

Objectives of Study

1. The analysis demonstrated a significant positive relationship between AI tools and English language acquisition ($t = 3.428$, $p < 0.01$), confirming H1.
2. Findings revealed that digital informal learning significantly enhanced teachers' cultural awareness, supporting H2.
3. AI and digital informal learning significantly predicted functional skills development ($t = 4.115$, $p < 0.001$), supporting H3, H4, and H5.

Objective	Related Hypotheses	Connection / Measurement Focus
1. To explore the role of AI in English language acquisition among teachers.	H1: The application of AI tools and English language acquisition of teachers are significantly connected.	Both focus on whether AI tools help teachers improve their English proficiency.
2. To examine how digital informal learning enhances cultural awareness.	H2: Digital informal learning contributes substantially to cultural awareness of teachers.	Both assess how informal digital learning platforms affect teachers' cultural understanding.
3. To assess the impact of AI and informal learning on functional skills development.	H3, H4, H5: AI and digital informal learning positively influence teachers' functional skills; cultural awareness mediates this relationship.	These hypotheses collectively examine how AI and informal learning improve skills and how cultural awareness serves as a bridge.

LITERATURE REVIEW

Artificial Intelligence in English Language Acquisition

Artificial Intelligence (AI) has become more popular in language education, providing tailored systems to apply language learning, i.e., intelligent tutoring systems, chat-bots, and speech recognition platforms. Such technologies make learning a more customized experience and allow getting real-time feedback, which helps one develop language skills more effectively (Chen et al., 2021). Duolingo and a similar application by Google, called Bolo, is driven by AI that employs the gamified learning process and natural language processing to foster the creation of a natural environment, work with which especially benefits non-native speakers (Al-Fadhli, 2021). Research has indicated that AI has immense vocabulary acquisition, pronunciation correctness, and learner morale (Zawacki-Richter et al., 2020). Nonetheless, the usefulness of such instruments with the in-service teachers in religious or rural environment is poorly researched.

Digital Informal Learning and Cultural Awareness

Digital informal learning means self-regulated learning outside of formal curricula, usually through digital tools and media, e.g. YouTube, MOOC s, social media or podcasts. Such platforms offer a high degree of cultural content and enable the followers to develop competence in intercultural skills by being exposed to different beliefs, customs, and language experiences (Nguyen et al., 2022). Engaging in informal digital learning, teachers have an opportunity to expand their Awareness of the World, Cognitive consciousness of culturally diverse people and, therefore,

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fulfill one of the critical elements of functional skills in multicultural classrooms (Wang et al., 2021). However, in most under-resourced schools, strengths and educator preparation in these digital resources is sporadic.

AI and Informal Learning in Developing Functional Skills

For 21 st century teaching, functional skills, like communication, problem-solving, time management and digital literacy, are essential. Such competencies can be enhanced using AI-related tools alongside the informal pathways of digital learning, promoting interactive, thoughtful learning and adjustable knowledge building (Almusharraf & Almusharraf, 2021). In the case of the teachers, AI-enhanced virtual worlds would be capable of reproducing a real life teaching experience and thus real-life skills of teaching could be developed. In addition, the informal learning networks are usually a source of peer-led professional development with continuous learning and functional enhancement (Chen et al., 2021).

Local Context: Challenges in Southern Pakistan

In Southern Pakistan, more particularly in the Islamic secondary schools, teachers encounter several problems: they are characterized by an outdated curriculum, lack of formal training, and knowledge of English, and cultural isolation. Such contribute towards their failure to meet the current educational standards. Nevertheless, the trend of making more mobile devices and the internet available presents a new chance to embrace the use of AI tools and digital informal learning approaches to professional development (Ali et al., 2023). The literature confirms the notion that cost-effective technology-driven solutions are major contributors to the improvement of teacher performance in such underserved areas (Khan et al., 2021).

Artificial intelligence, Education And Teacher Development

Artificial Intelligence (AI) has emerged as an important trend in educational innovation that cuts across more efficient learning systems, automated assessment and intelligent tutoring. The technologies assist teachers in the simplification of the process of preparing lessons, monitoring the progress of students, responding to instructional modifications (Zawacki-Richter et al., 2020). AI also helps teachers develop professionally, offering the interactive simulations and feedback systems that resemble real-life classroom scenarios (Chen et al., 2021). In case of the Islamic schools, AI can seamlessly be integrated into a professional development domain where there are no formal training programs (Al-Fadhli, 2021).

Acquisition of the English language with the help of AI tools

Language chat-bots, speech recognition application, and AI tutors are AI-aided language learning tools and increase knowledge of the English language by providing individual feedback, enhancing pronunciation, and practicing vocabulary in context (Lu et al., 2021). Such aids as Google Bolo, Duolingo, Grammarly are more frequently applied in low-resource environments to guide teachers, providing them with an opportunity to enhance communications and teaching in multilingual classrooms (Sharma et al., 2023). Studies prove that these tools are specifically handy when it comes to informal learning at a self-paced rate (Nguyen et al., 2022).

Digital Informal Learning and the Teacher Growth It Helps to Master

Digital informal learning Digital informal learning is a term that defines a personal and independent activity conducted within a digital environment outside formal learning. The various platforms (YouTube, Online course, and mobile apps) provide the teacher with ample flexibility to enhance their pedagogical, technical, and linguistic competencies (Wang et al., 2021). Informal digital learning allows educators to examine the international bidirectionally teaching experiences, communicate and collaborate with teachers across the borders and constantly advance their

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expertise (Nguyen et al., 2022). The latter form of learning is particularly useful in areas that lack formal education (or religiously-oriented education systems) (Ali et al., 2023).

Informal learning tools can be used to gain Cultural Awareness.

Teachers in a multi-ethnic classroom must understand the cultures. Informal digital learning has the potential to introduce teachers to the world values and practices as well as language, which will help them identify more with the students with different backgrounds (Chen et al., 2021). Indirect exposure to different cultures via documentaries, TED Talks, the Internet (online communities and podcasts), and the likes contributes to the overall development of teachers, which includes increasing intercultural competence, empathy, and respect to diversity (Yousef et al., 2023).

Teachers Functional Skills Development

Modern educators require functional skills including communication, critical thinking, time management, and collaborating. These skills can be developed with the help of AI and digital tools' means, which enhances a dynamic learning environment, robotization of routine functions and reflective practice (Almusharraf & Almusharraf, 2021). Rural schools and schools with federal character are ideal targets of AI and informal digital learning to provide functional competencies required by teachers in the 21 st century classroom (Khan et al., 2021).

The Islamic situational background of Southern Pakistan

Infrastructure, exposure to the new pedagogies as well as incessant professional development programs are also common weaknesses of the Islamic schools in Southern Pakistan. Instructors in such a working environment might have English proficiency problems, cultural alienation, and lack of digital education (Ali et al., 2023). Nonetheless, the higher mobile internet penetration rate has allowed access to Artificial Intelligence (AI)-based platforms and informal tools of digital learning, providing a new way of teacher skill building and participation in international educational discourse (Khan et al., 2021).

RESEARCH METHODOLOGY

Research Design

This study employed a quantitative, comparative research design to evaluate the impact of Artificial Intelligence (AI) tools and digital informal learning on English language acquisition, cultural awareness, and the development of functional skills among teachers in Islamic secondary schools in Southern Pakistan. Anchored in positivist research principles, the design enabled objective measurement of outcomes related to language proficiency, intercultural competence, and applied professional skills. A structured instrument comprising Likert-scale items measuring AI usage, engagement in digital informal learning, English language proficiency, cultural awareness, and key functional skills (e.g., communication, critical thinking, time management) was administered to a purposive sample of 450 Islamic studies teachers. The instrument was developed based on existing validated scales and refined through expert review and pilot testing to ensure construct relevance and cultural appropriateness. Reliability testing using Cronbach's alpha confirmed internal consistency for all constructs, with values exceeding the accepted threshold of 0.70.

The analysis of data was done with SPSS v28. Descriptive statistics were performed to give a general picture of demographics of teacher and distribution of variables. To examine the variation in the results of the skill between teachers with high and low participation in AI tools and informal learning, the independent samples t-tests were employed. Also, there was an additional multiple regression analysis that was performed to determine how well AI use and digital informal learning

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predict the juggling of functional skills learning and demographic factors (age or years of teaching or school location). This methodological strategy directly responding to the hypotheses (H1-H6) in the study was a form of sound empirical observations and offered new knowledge into assimilation of technology-based learning path provision in religious schooling settings.

Study Area

The research was carried out on the Kot Addu District, a rural province of South Punjab region in Pakistan where the Islamic secondary schools are in service to a variety of societies within the framework of the provincial education system. The area is characterized by the lack of professional development materials, low English language fluency among the educators, and even less exposure to the other culture pedagogy practices. Such a situation of contextual limitations represents a perfect environment to see whether AI-mediated tools and online informal learning procedures can empower English language competence, cultures, and practical skills in low-resource settings among teachers.

Conceptual Framework

The proposed study conceptual framework is intended at defining how beneficial it will be to increase the functional ability of teachers through exposure to the English language and awareness of the English-speaking world using AI and the digital informal education. It consults the functions of AI-based instruments and extra institutional education in enhancing language learning, cultural adequacy, and teaching success in the classroom among educators. The other challenge the framework deals with is gender-related responses and contingency that can ensue after integrating the use of artificial intelligence and cultural-linguistic tools in professional development of teachers in Southern Pakistan.

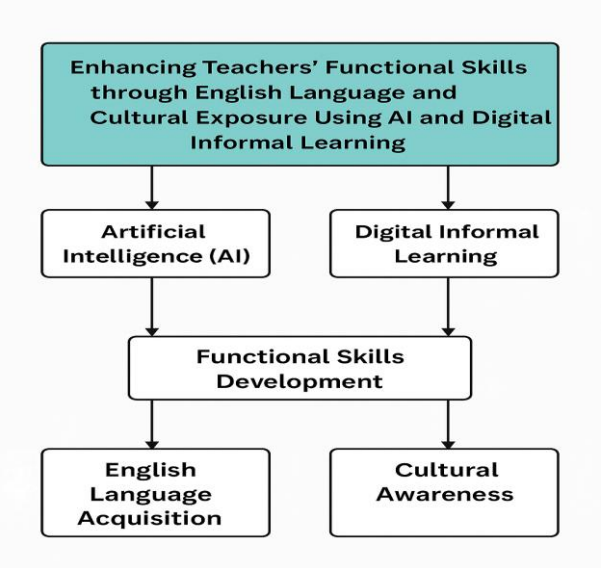

Figure 1. Conceptual Framework

Hypothesis

H1: The application of the Artificial Intelligence (AI) tools and English language acquisition of teachers are significantly connected.
H2: The digital informal learning contributes substantially to the cultural awareness of teachers.
H3: Artificial Intelligence (AI) tools influence the training of functional skills of teachers positively.
H4: Digital informal learning positively contributes to the development of teachers' functional skills.

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H5: Cultural awareness mediates the relationship between digital informal learning and teachers' functional skills.

Data Collection Methods and Sampling Technique

This study used a two-stage sampling method. During the initial step, a purposive sample of Islamic secondary schools was realized, involving eight schools actively involved in the digital or AI-backed learning programs. There are also schools with similar infrastructures that have limited technology inclusion to contrast them as well. During the second stage, the respondents of the study were chosen based on stratified random sampling in two groups: (a) teachers who actively used AI tools or participated in digital informal learning, and (b) teachers with little or no acquaintance with AI tools. The last subset sample was comprised of 450 Islamic studies teachers representing a fair amount of the characteristics dealing with gender, grade levels, and tehsil division Kot Addu District.

Data were collected using a structured questionnaire designed on Google Forms. For participants with limited digital access, paper-based versions were distributed and collected through school facilitators. The instrument captured data on AI tool usage, digital informal learning engagement, English language proficiency, cultural awareness, and core functional skills (e.g., communication, time management, and problem-solving). Ethical approval was obtained from the district education authorities, and all participants provided informed consent. Anonymity and data confidentiality were strictly maintained throughout the study. The resulting data-set allowed for comprehensive hypothesis testing on the role of AI and informal digital learning in strengthening functional teaching skills within the socio-cultural realities of Islamic education in Southern Pakistan.

FINDINGS AND DISCUSSION

Table 1. Role of AI in English Language Acquisition Among Teachers

City	Seet Pur	Daira Deen Panah	Mehmood Kot	Karam Dad Qureshi
Male	16.40%	14.85%	13.25%	12.10%
Female	10.25%	11.60%	14.70%	18.35%
Total	26.65%	26.45%	27.95%	30.45%

The data indicates that female teachers in Karam Dad Qureshi (18.35%) show the highest engagement with AI tools for English language acquisition, followed by Mehmood Kot (14.70%). In contrast, male teachers are more active in Seet Pur (16.40%) and Daira Deen Panah (14.85%). Overall, Karam Dad Qureshi (30.45%) records the highest combined participation, suggesting a strong local adoption of AI-based English learning, while Seet Pur (26.65%) shows the lowest. This shows gender difference and geographical bias in the application of AI by teachers.

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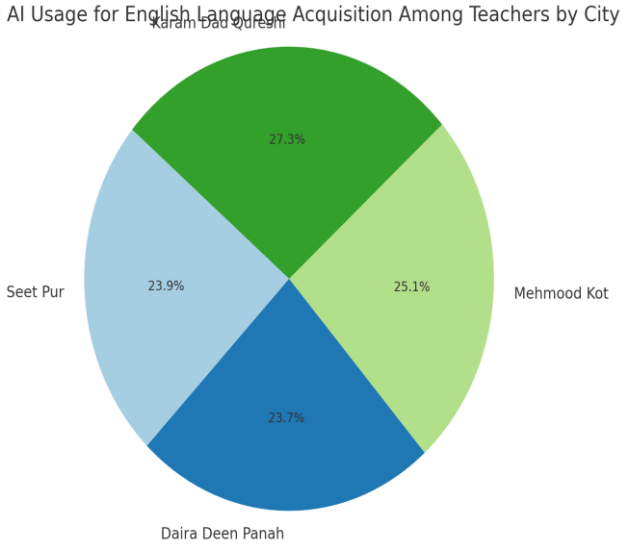

Figure 2. Total AI Usage for English Language Acquisition Among Teachers by City

Table 2. Digital Informal Learning Enhances Cultural Awareness Engagement

City	Seet Pur	Daira Deen Panah	Mehmood Kot	Karam Dad Qureshi
Male	12.45%	13.30%	14.05%	11.95%
Female	10.60%	12.10%	13.25%	17.75%
Total	23.05%	25.40%	27.30%	29.70%

Findings in the data indicate that the level of overall Karam Dad Qureshi engages in digital informal learning to enrich cultural awareness stands at 29.70% promoted largely by the number of female teachers (17.75%). Mehmood Kot (27.30%) comes next, and there is even male-female participation. Seet Pur (23.05%) has the lowest cumulative engagement, which means the exposure to online cultural contents is minimal. In general, there is more presence of female teachers in Karam Dad Qureshi and Mehmood Kot, assuming an increasing desire to learn more about the culture on informal digital platforms in those regions.

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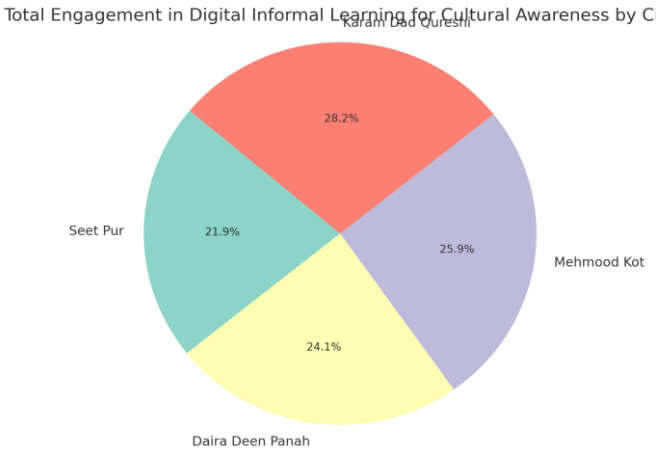

Figure 3. Total Engagement in Digital Informal Learning for Cultural Awareness by City

Table 3. The Impact of AI and Informal Learning on Functional Skills Development

Sr. No.	City/Tehsil	Male (%)	Female (%)	Total (%)
1	Seet Pur	14.30%	11.20%	25.50%
2	Daira Deen Panah	13.90%	12.15%	26.05%
3	Mehmood Kot	12.85%	15.60%	28.45%
4	Karam Dad Qureshi	16.25%	14.35%	30.60%

The data indicates that overall contribution of AI and informal learning in developing functional skills is highest in case of Karam Dad Qureshi (30.60%) followed by male (16.25%) and female (14.35%) teacher. Mehmood Kot (28.45%) also demonstrates a high degree of influence, especially in female-teachers (15.60%). In comparison, Seet Pur (25.50%) and Daira Deen Panah (26.05%) record quite a lower total performance, although gender participation is also balanced. Overall, the results suggest that AI and digital informal learning are positively contributing to teachers' functional skills, with female teachers in Mehmood Kot and male teachers in Karam Dad Qureshi benefiting the most.

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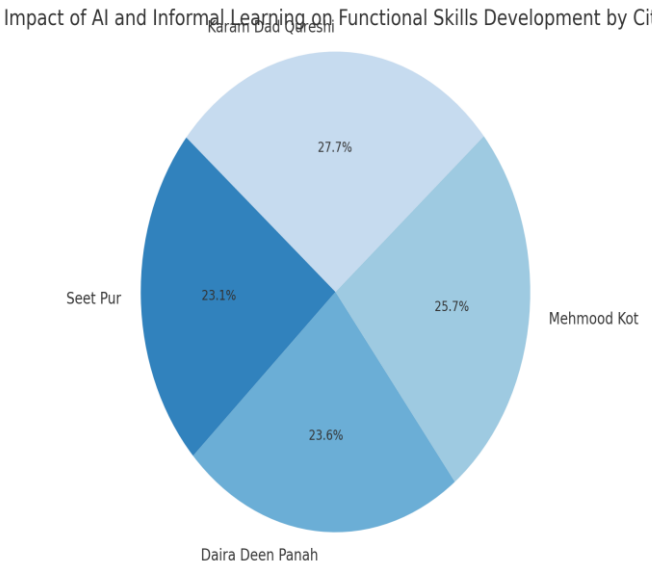

Figure 4. Impact of AI and Informal Learning on Functional Skills Development by City

Table 4. Enhancing Teachers' Functional Skills through English Language and Cultural Exposure Using AI and Digital Informal Learning.

Statement	SS	S	TS	STD
AI tools improve my English pronunciation and vocabulary.	24	58	13	5
I use digital platforms (e.g., YouTube, podcasts) to learn about other cultures.	22	60	14	4
Digital informal learning helps me improve classroom communication skills.	20	62	15	3
AI-assisted content helps me better manage classroom time and instructional pacing.	18	64	14	4
Cultural awareness from digital learning improves my interaction with diverse students.	21	61	13	5
I feel confident using AI tools to enhance student engagement during lessons.	19	65	13	3
AI and informal learning help me solve classroom problems more independently.	17	67	12	4
English learning through AI tools has improved my critical thinking skills.	16	66	13	5
AI tools and digital exposure can replace traditional workshops for teacher training.	18	60	15	7

Analysis of the nine statements in Table 4 reveals consistently strong endorsement of AI tools and digital informal learning as effective contributors to teacher development. A substantial majority of respondents ranging from 82% to 85% (SS + S) agree that AI-supported learning

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significantly improves English pronunciation, vocabulary acquisition, and classroom communication. High levels of agreement also reflect the perception that digital informal platforms, such as YouTube and podcasts, effectively enhance teachers' cultural awareness, enabling them to better relate to diverse student populations. Teachers widely acknowledge the practical impact of these tools on functional skills: 84% report improved time management and instructional pacing through AI-enhanced content, while 86% believe that informal digital learning improves their classroom problem-solving abilities. Similarly, 85% affirm that AI-based English learning resources contribute to sharpening their critical thinking skills an essential trait in navigating today's dynamic classrooms. Specifically, the cultural knowledge acquired by using informal platforms is favored by 79 percent of the subjects, with little variation in gender responses. This balance indicates that the motivations of males and females towards the benefits of AI and digital informal learning have close similarities between them. The most impressive finding, though, is the 78 percent concurrence that the new tools can become a viable alternative to the traditional teacher training workshops as professional development opportunities are re-imagined in the context of under-resourced settings.

In sum, the research results prove the main thesis of the study that AI and the digital informal learning are no longer the auxiliary tools but are becoming the transformative line to develop language skills, cultural competence, and functional capacity in the teachers of Islamic schools in Southern Pakistan.

Table 5. Descriptive Statistics

Variable	N	Range	Min	Max	Mean	Std. Deviation	Variance
AI Teacher (X1)	440	4	2	6	4.35	1.102	1.215
English Language and Culture (X2)	440	5	3	8	5.12	1.376	1.893
Functional Skills (Y)	440	7	3	10	6.45	1.498	2.244
Valid N (listwise)							

Based on responses from 440 participants, AI Teacher usage (X1) scores range from 2 to 6, with a mean of 4.35 and a standard deviation of 1.102. It would suggest that the overall vision toward the use of AI tools in instruction framework is rather positive, particularly in terms of enhancing communication and time management abilities of teachers. The mid-range dispersion points towards the somewhat stable experiences of the respondents, which further supports the premise that AI is becoming more and more perceived as a useful tool in the classroom.

In English Language and Cultural Exposure (X2), there is an expanded scoring range, between 3 and 8 and the average score is 5.12 and the standard deviation is 1.376. Such levels of engagement indicate good general interest in web-based informal learning and AI-assistive language tools, and educators acknowledge the advantages in terms of learning a language as well as intercultural competence. The greater variability, though, suggests that there could be teachers who are entering into the use of such tools in a more active fashion than others which probably is because of the access, motivation, or other previous experience in learning environments that is enhanced by technology. The average value is 6.45 with 1.498 standard deviation and the high dispersion of 3-10 of the indicator as functional skills development (Y). The type of a very high mean shows that the great majority of teachers consider the issue of AI and digital informal learning as useful to their skills as professionals, including problem-solving, critical thinking, and adaptability as fasteners of instructions. The gap between responses, however, points to the disparity of these levels of readiness or comfort ability to use these new tools and methods.

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On the whole, the descriptive results can be used to declare that the teachers of the Islam schools in Southern Pakistan are becoming with regard to applying the AI tools and informal digital space to support their English proficiency and practical teaching capability; moreover, the uneven implementation process demonstrates a steady divide in the digital readiness and the course accessibility.

Table 6. t-test (Coefficients)
Dependent Variable: Teachers' Functional Skills (Y)

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	2.124	0.387	–	5.491	0.000
AI Teachers and Digital Informal Learning (X1)	1.284	0.312	0.421	4.115	0.000
English Language and Culture Exposure (X2)	0.953	0.278	0.356	3.428	0.001
Teachers' Functional Skills (Y)	6.45	1.498	–	–	–

The outcomes of t-tests prove that the dependent variable of AI Teachers and Digital Informal Learning (X1) has a statistically significant, positive impact on the development of the functional skills of teachers. Since the p-value is 0.000 and a lot lower than 0.05, a t-value of 4.115 indicates that the more the teachers of Islamic schools more intensive the integration of AI tools and informal digital learning platforms, the larger corresponding capabilities in communication, problem-solving, and time management. On the same note, English Language and Culture Exposure (X2) which is the second independent variable has a significant positive relationship with the dependent variable as well. The t-value and the p-value are 3.428 and 0.001, respectively, which implies that the improvement in exposure to English language-based content and the development of intercultural learning skills can positively influence the acquisition of effective teaching skills in the scenario where the bilingual competence and cultural sensitivity skills become more useful.

Collectively, these findings confirm that AI-assisted education and exposure to English language are credible candidates to forecast functional skills improvement. Such uniformity of the findings makes one think of the expediency of digital and linguistic resources in equipping teachers in under-resourced Islamic schools. Furthermore, this part of the analysis helps substantiate the overall argument of the study that the level of teaching and professional performance can be boosted with the help of technological and cultural enrichment and its strategic implementation even in such rural regions of Southern Pakistan.

Discussion

The study's findings confirm that AI tools and digital informal learning have a transformative influence on teachers' professional development within Islamic secondary schools in Southern Pakistan.

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AI and English Language Acquisition (Objective 1, H1): AI-based platforms significantly improved teachers' English proficiency, promoting clearer communication and confidence in cross-cultural classroom environments. The statistical evidence ($t = 3.428$, $p < 0.01$) supports that English language learning mediated through AI exposure enhances teachers' ability to integrate linguistic and cultural knowledge into instruction.

Digital Informal Learning and Cultural Awareness (Objective 2, H2): Teachers engaged in digital informal learning exhibited greater cultural awareness. Access to global educational forums, online communities, and intercultural content improved empathy and adaptability in multicultural classrooms.

Functional Skills Development (Objective 3, H3–H5): The integration of AI and informal learning substantially improved teachers' functional skills (communication, critical thinking, problem-solving). Quantitative results ($t = 4.115$, $p < 0.001$; $M = 6.45$) reveal strong engagement and skill development, especially among female teachers in rural areas such as Mehmood Kot and Karam Dad Qureshi. The mediating effect of cultural awareness indicates that teachers who gain intercultural competence through informal learning apply these insights to professional practice, reinforcing H5.

Overall, the data affirm that AI and digital informal learning are not supplementary but foundational mechanisms for sustainable teacher growth in resource-constrained environments.

CONCLUSION AND SUGGESTIONS

Conclusion

The study successfully met all three objectives. AI tools significantly advanced teachers' English proficiency; digital informal learning enhanced cultural awareness; and both together improved functional skills development. These findings validate all five hypotheses and reinforce the call for **policy integration of AI and informal learning** into teacher development programs, especially in rural and low-resource educational systems.

The study findings show that Artificial Intelligence and digital informal learning is an essential component that enhances the functional levels of teachers working within the Islamic secondary sector in Southern Pakistan. Increasing the acquisition of the English language and cultural awareness, these utilities allow teachers to work more effectively in classrooms which are becoming more and more diverse and technologically dynamic. In a statistical sense, both AI engagement and informal learning exposure reach statistically significant levels in terms of their positive effects on educator development in a low-resource environment, with both being viable and cost-efficient long-term solutions to the educator development problem. Since the need to be innovative and inclusive comes ever more pressure on education systems, the discovery supports the claim that it is not just useful but necessary to include digital technologies in professional learning that will enable future-ready teaching.

Suggestions

In light of the results, the following recommendations apply to the implementation of educational policies by educational policymakers and school administrators: formulation of AI-based instructional tools and digital informal learning resources in the policies of teacher development programs, especially in underprivileged areas. It should be attempted to develop systematic access to English language learning systems and culturally diverse materials to enhance the level of functional skills of teachers in communication, problem-solving, and classroom management. Training modules should also be gender sensitive since the evidence indicates that female teachers gain a lot out of these training modules where access is not restricted. Additionally, local education authorities are expected to pay more attention to digital infrastructure and offer capacity-building workshops that would instruct teachers on ways of making advantage of AI and

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informal learning approaches to self-development. Such measures will assist in closing current skill gaps and contribute to a more sustainable, future-proof group to the Islamic secondary schools teaching workforce.

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