

PREPARING SECONDARY SCHOOLS IN ZIARAT DISTRICT FOR THE FUTURE: TEACHERS' READINESS, ATTITUDE AND CONCERNS REGARDING ARTIFICIAL INTELLIGENCE IN EDUCATION

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ABSTRACT

The popularity of artificial intelligence (AI) is increasing in the sphere of education, but its successful integration also depends on teacher competence and institution support and technology availability. The current study investigated teachers' attitudes, readiness, concerns, and barriers regarding the use of AI in government secondary schools in Ziarat District, Balochistan, Pakistan. Descriptive research design was used, and the sample included 120 teachers of both sexes. Data collection was conducted via 5-point Likert-scale questionnaire. The results of the study reveal the positive attitudes towards integration of AI, 74% agree that AI increases the efficiency of teaching process, 68% agree that it increases student engagement, 70% agree that it helps implementing personalized learning, and 71% agree that it facilitates assessment and grading ($M = 3.92$). In terms of readiness, 66% of respondents stated that they would use AI tools, 78% of teachers were willing to undergo AI training, 52% had the basic skills, and 49% agree that there is enough technological facilities ($M = 3.74$). Some of the concerns about AI were that it will replace teachers (49%) and decreases human interaction (53%) ($M = 3.12$). The barriers to AI included lack of training in AI (82%), poor Internet connectivity (76%), lack of technological facilities (71%), lack of technical support (68%), and ethical and privacy issues (57%) ($M = 4.02$). The study has applied TAM and UTAUT not as causal models but as interpretive frameworks.

I. INTRODUCTION

Background

At the moment, the possibilities to introduce artificial intelligence in education are numerous as this technology can be used in adaptive learning, automated feedback, learning analytics, content generation, and decision-support systems. There are practical and ethical concerns related to the use of AI in education, as teachers should determine whether they can use particular technology, whether it is useful enough, whether they know the way to work with it properly, and how to use it appropriately. According to the international recommendations, AI should be used to enhance the capabilities of humans and not to eliminate human interaction in education (Miao et al., 2021; UNESCO, 2023). The issue becomes particularly important in terms of limited resources. Even if the teacher

wants to try the technology, he or she can lack internet connectivity, devices, proper training, and technical support to do it. As a result, the problem of teacher acceptance masks the wider institutional problems. According to the framework of TAM, the technology acceptance is determined by the perceived usefulness and ease of use of technology (Davis, 1989), and UTAUT includes such factors as performance expectancy, effort expectancy, social influence, and facilitating conditions (Venkatesh et al., 2003). It is very important, as the above frameworks force the researcher to take into account the practical conditions of technology adoption rather than just enthusiasm. There is certain evidence on the teachers' and educators' adoption of AI in Pakistan. According to Jaffar et al. (2024), the positive attitudes and perceived behavioral control are positively associated with the teachers' intention to use ChatGPT for teaching purposes. Also, the surveys show the wide adoption of AI among the Pakistani educators and call for further professional development and policies (Ahmed et al., 2024). Qualitative research conducted in Pakistan shows that the awareness of AI and its adoption in teaching requires various approaches, particularly in cases when the necessary infrastructure and institutional support is missing (Hussain & Pervaiz, 2024).

The Balochistan region requires a separate consideration. The provincial EMIS system provides statistical data on the schools' situation in the province. According to the 2023-24 statistics, there are 300 government schools and 15,043 students in Ziarat, including 7,995 boys and 7,048 girls. The same source provides statistical data on the provision of schools by level and gender (Government of Balochistan, 2024). The provincial EMIS system also provides the district-level monitoring indicators and keeps the active educational data infrastructure. Therefore, the local source of information makes Ziarat a relevant context for analyzing the use of emerging technologies in a rural public school system. The present paper considers the situation of secondary school teachers in Ziarat District. The purpose of this paper is not to describe this district as technologically underdeveloped or consider the teachers as unwilling to innovate. The problem described here is much more practical. What do teachers say about the value of AI, their readiness to use it, concerns about its role, and the barriers to the implementation?

Problem Statement

Therefore, the problem is in the gap between teachers' motivation to accept AI and the conditions of its practical implementation. The survey results reveal the rather positive attitude of teachers to the educational potential of AI, but at the same time their skills and access to technological resources are not very favorable. This aspect is critical, as the scale of teachers' attitude will not give any information on whether the school is ready to accept AI. For example, the teacher may think that AI can help him or her, but will lack access to the technology and the skills of working with it. The previous manuscript mentioned the answers of teachers on certain aspects of the use of AI as "misconceptions." This term was replaced by another one, as the items measuring concerns and teachers' perception of the role of AI do not prove whether a particular idea of the teachers is true or not. This is especially important when discussing such concepts as replacement of the teachers, human interaction, complexity, and appropriateness of AI in developing countries. Therefore, the study regards them as perceptions that should be understood, not misconceptions that should be explained.

Purpose of the Study

The purpose of the current study is to investigate secondary school teachers' attitudes, readiness, concerns, and perceptions regarding the implementation of AI in government secondary schools in Ziarat District, Balochistan.

Objectives

- To investigate the attitudes of secondary school teachers to the use of AI in education.
- To assess teachers' readiness to use AI in teaching and related educational practices.
- To identify the concerns and perceptions of teachers regarding the role of AI in education.
- To identify the barriers to AI adoption.
- To investigate the differences in teachers' attitudes, readiness, concerns, and perceptions of barriers in terms of gender, age, and teaching experience, where the data allows for inferential analysis.
- To interpret the results in terms of TAM and UTAUT without causal claims beyond the research design.

Research Questions

- What are the attitudes of secondary school teachers in Ziarat District to the implementation of AI?

- How do teachers feel themselves ready to use AI in teaching?
- What are the concerns and perceptions of teachers regarding the role of AI in education?
- What are the barriers to AI adoption perceived by teachers?
- Do the teachers' attitudes, readiness, concerns, and perceptions of barriers vary by gender, age, and teaching experience?

Significance

The study will be useful on three levels. Firstly, it will provide the information about teachers' attitudes in Ziarat to the district's education stakeholders. Secondly, it will add to the provincial literature evidence about the rural Balochistan. Finally, it will show that teachers' readiness to adopt the technology requires considering various aspects: willingness, skills, access, support, and concerns about the proper use of AI.

II. LITERATURE REVIEW

AI in Education: Promise and Caution

Usually, the potential of AI in education is presented through such possibilities of the technology as personalization of learning, automation of some processes, provision of feedback, and access to educational resources (Luckin et al., 2016; Holmes et al., 2019). Nevertheless, recent reviews show the rapid growth of the research on AI in education and variable evidential bases depending on the context (Zhai et al., 2021). According to Williamson and Eynon (2020), it is wrong to consider the AI as a brand-new technology that is unrelated to the history of the educational technology, datafication, and automation of the education sector. It is especially important as it emphasizes the necessity to consider the institutional issues in addition to technical ones. Nevertheless, ethical issues are as important as technical ones. According to UNESCO (2021), such concepts as human rights, fairness, privacy, transparency, and accountability should be taken into account when introducing AI. The recommendations for generative AI in education and research emphasize the necessity of human agency, data protection, and institutional safeguards (UNESCO, 2023). It is especially important for the present study, as even considering the focus on learning analytics, rather than generative AI, the studies of Ifenthaler and Schumacher (2016) reveal the impact of learners' and educators' privacy perceptions on the acceptance of data-intensive educational technologies. Therefore, they are included in the literature review because privacy and trust are parts of the technology adoption environment.

AI Literacy and Teacher Competence

AI literacy does not include the knowledge about the way to use the particular tool only. According to Ng et al. (2021), AI literacy is broader concept and includes the knowledge and competencies necessary to comprehend AI, interact with it, and evaluate its impact. In terms of the teachers, it implies the estimation of the quality of AI-generated materials, determination of its limits, protection of students' information, and estimation whether the use of AI will be helpful for learning. Such viewpoint is consistent with the broader one that suggests AI introduction through pedagogical reasoning. It is important for Ziarat, as the survey shows the gap between the willingness to accept AI and teachers' skills. While 78% of teachers agreed to be trained in AI, only 52% possessed the basic AI skills. It means that professional training is needed, but the survey cannot prove the increased readiness due to lack of intervention.

Technology Acceptance and Educational Technology

Perceived usefulness and perceived ease of use are the main determinants of the technology acceptance in the TAM, which was introduced by Davis (1989). The UTAUT model extends the technology acceptance research adding such concepts as performance expectancy, effort expectancy, social influence, and facilitating conditions (Venkatesh et al., 2003). However, in educational contexts, these concepts acquire greater importance, as teachers adopt technology in their organization. In the current study, TAM and UTAUT are used as organizing frameworks, but not latent variable causal models to test. Despite the fact that the questionnaire is not documented in the original research with the complete construct-level measurement plan and factor analysis or structural model in the supplied dataset, the present manuscript makes a narrower claim: the survey is informed by TAM/UTAUT, and the items can be interpreted in terms of usefulness, ease of use, and facilitating conditions.

Pakistan-Specific Evidence

Recent Pakistani literature proves that educators are accepting the use of AI but negotiate about it. Thus, according to the study of Jaffar et al. (2024), the positive attitudes, perceived behavioral control, and intentions to use ChatGPT for teaching purposes are positively associated among 493 university teachers across Pakistan. Also, according to the study of Ahmed et al. (2024), there is the wide adoption of AI tools among educators and calls for the policy reform, training, and technical support. Naeem et al. (2023) also conducted a study on the perceptions of AI in Pakistan, enriching the local literature on the adoption of educational technologies.

Evidence from Balochistan

The evidence about AI in Balochistan is also emerging. Thus, the study, conducted by Ahmed, Mallah, and Shaheen (2024), was conducted among the teachers and students of Pakistani higher education and included one of the authors, based at Lasbela University of Agriculture, Water and Marine Sciences in Balochistan. Recent studies investigate the perceptions of generative AI among the university educators in Balochistan. Although the studies mentioned do not directly address the research question, as they deal with the adoption of AI in higher education, they demonstrate the necessity to investigate AI readiness in Balochistan schools.

Rural and Resource-Constrained Contexts

The literature on digital education shows that access to the technology determines what can be done with it. Thus, OECD (2021) and Miao et al. (2021) emphasize the necessity to consider the infrastructure, teacher competence, governance, and equity issues in the technology policy. The practical implication for districts such as Ziarat is obvious – a positive attitude cannot cover up the long-term lack of connectivity, devices, and technical support.

Ethical and Privacy Concerns

The issue of privacy, data usage, bias, transparency, and professional responsibility arises together with AI. According to UNESCO (2021, 2023), these issues should be taken into account in the human-centered approach. The present questionnaire contains the ethical and privacy issues as the item of barrier, but this aspect should not be regarded as evidence that the teachers are "misinformed." The concerns about privacy are justified for professionals because of the uncertainties about the way AI handles the educational data.

Concerns and Perceptions Regarding AI's Role

The construct in the revised version is different from the term used in the previous manuscript. The questionnaire contains the items such as "AI will replace teachers," "AI reduces teacher importance," "AI is too complex for classroom use," "AI reduces human interaction," and "AI is only useful in developed countries." These items do not belong to the same conceptual category, as the first two refer to the future professional role of teachers, the fourth one refers to the human interaction, the third one to the perceived complexity, and the last one to the contextual judgment about the place of use. Therefore, the present article considers the scale as the general measure of concerns and perceptions regarding the role of AI, admitting that the items are heterogeneous. The item that AI will not replace teachers should also be considered with caution. At the moment, the majority of the educational literature describes AI as the tool that should complement the professional role of teachers, focusing on professional judgment, relationships, caring, classroom management, and contextual knowledge (Holmes et al., 2019; UNESCO, 2023; Selwyn, 2019). It is a position of the literature, not an undisputed fact that the survey could prove.

Research Gap

From the literature point of view, there is growing interest in the technology acceptance although the evidence base is uneven geographically, in terms of the educational level and institutional context. There is emerging evidence in the AI in education literature in Pakistan: the adoption of AI by university teachers and the use of generative AI by educators. Also, Balochistan-specific evidence starts emerging. However, there is no study on the extent of positive attitudes and readiness towards AI among the secondary school teachers in Ziarat, nor the contextual barriers and concerns related to it.

Theoretical Framework and Mapping of Items to Theory

Since the original instrument did not include an explicit TAM/UTAUT scoring framework, the present manuscript does not make the stronger claim that every scale in the instrument is either a TAM or UTAU concept. Below is a mapping of the questionnaire items to the concepts, showing their conceptual relationships.

Questionnaire domain/items	Primary conceptual link	Interpretive use
Attitude items 1–4: teaching effectiveness, engagement, personalized learning, assessment	TAM perceived usefulness; UTAUT performance expectancy	Indicates whether teachers perceive educational value in AI.
Readiness item 1: ready to use AI tools	Behavioral readiness/intention	Indicates willingness to engage with AI.
Readiness item 2: basic AI skills	TAM ease-of-use related capability	Indicates perceived competence, not a direct measure of perceived ease of use.
Readiness item 3: school supports AI integration	UTAUT facilitating conditions	Indicates institutional support.
Readiness item 4: access to technological resources	UTAUT facilitating conditions	Indicates material conditions for use.
Readiness item 5: willing to attend AI training	UTAUT facilitating conditions/capability development	Indicates willingness to develop capacity.
Concerns items 1–5	Attitudinal/contextual concerns	Used descriptively; not treated as a TAM/UTAUT latent construct.
Barrier items 1–5	UTAUT facilitating conditions; organisational/ethical context	Used to describe implementation constraints.

The above mapping is deliberately conservative. In utilizing it, this discussion does not make the assertion that there is some theoretical construct that is assessed by the survey questions because there is no sufficient validity evidence to make such a strong assertion in the literature. Future research should consider developing TAM/UTAUT scales and conduct piloting and factor analysis.

III. METHOD

Research Design

A cross-sectional, descriptive survey design is utilized. The cross-sectional survey design is suitable for the description of the state of affairs at a certain moment and for comparisons between groups, where respondent-level data can be analyzed. Causality is not implied here. Consequently, the revised manuscript avoids the language of infrastructure "causing" readiness or attitudes "predicting" adoption.

Research Setting and Population

The study was performed in government secondary schools in Ziarat District, Balochistan Province, Pakistan. The study population is comprised of secondary school teachers who work in the district. The EMIS database provides the administrative context of school provision and enrolment in Ziarat (Government of Balochistan, 2024).

Sampling and Sample

The sample comprises 120 teachers, equally split into 60 males and 60 females. Since the gender ratio is fixed at 60/60, the sampling design can hardly be referred to as "simple random sampling," but is rather referred to as ****stratified sampling by gender****. The right procedure would be to stratify the sample by sex first and select a required number of people in each stratum using the random numbers rule. The whole log of randomization should be preserved. The current manuscript lacks the data on the total number of eligible teachers in the district, number of invitations sent and questionnaires distributed. This information cannot be fabricated.

Sampling information	Value in supplied manuscript	Final reporting treatment
Completed usable questionnaires	120	Reported
Male teachers	60	Reported
Female teachers	60	Reported
Total eligible secondary teachers in district	Not supplied	Must be verified from official sampling frame
Questionnaires distributed/invited.	Not supplied	Must be verified from field log
Response rate	Not calculable from supplied information	Not reported as a fabricated percentage

Respondent Characteristics

The sample included 28 teachers aged 23-30, 42 aged 31-40, 31 aged 41-50, and 19 aged 51-54. The number of teachers was 22 with 1-5 years of experience, 34 with 6-10 years, 41 with 11-20 years, and 23 with more than 20 years of experience. According to the original manuscript, it was necessary to include the variable of school location to ensure the geographical representation. However, there are no results by location in the supplied manuscript. The revised article does not make any claims about structuring the sample by geographical criterion.

Research Instrument

The data were gathered using the structured questionnaire with five-level Likert-type response options from 1 = Strongly Disagree to 5 = Strongly Agree. The questionnaire includes demographic items and four substantive scales: attitudes towards AI; readiness for AI integration; concerns and perceptions regarding the AI role; and barriers to AI adoption.

Language and Translation

The supplied manuscript lacks the information about the language of the questionnaire and the process of translation/back-translation. This information is critical because it concerns the statements about the teachers' replacement, the complexity and role of AI, and requires a precise understanding. The final report does not indicate that the instrument underwent any translations or back-translations. Regardless of whether it was translated into Urdu, Pashto, or some other language of the region, the final thesis/article should contain the whole translation and reconciliation process.

Validity and Reliability

The original manuscript states that the expert review of the instrument was performed and a pilot study was conducted with 20 teachers, leading to the Cronbach's alpha of .83 (ranging from .79 to .86 for the scales). These results are only presented in the original manuscript and should be verified before submitting the study to the journal. There is no report about the exploratory factor analysis in the supplied manuscript. Accordingly, the revised study does not claim that any factor analysis has established the scale structure. The absence of factor analysis is treated as a limitation of the study, especially for the "concerns and perceptions" scale, which is conceptual heterogeneous. In order to validate the scale structure in the future study, the exploratory factor analysis followed by confirmatory testing is necessary.

Data Analysis and Mean-Score Interpretation

The original analysis report includes frequencies, percentages, and mean scores. The revised analysis plan includes frequencies, percentages, mean scores, t-tests for gender, and one-way ANOVAs for age and teaching-experience groups across all four outcome scales. However, the supplied manuscript lacks respondent-level scale scores and presentation of mean and standard deviation per group. Therefore, the valid t- and F-tests cannot be calculated based on aggregate percentages. Rather than making up the inferential statistics, the final manuscript points at this limitation of data verification. The t-tests and ANOVAs should be performed on the original SPSS/Excel dataset prior to journal submission. Similarly, due to this, the standard deviations required in Tables 4.2-4.5 cannot be calculated from the figures provided. The latter tables provide the missing SDs directly, and not estimates. It would have been inappropriate to fabricate the statistics. In order to ensure consistent interpretation of the results, the

mean values have been categorized as follows: 1.00-2.33 = Low; 2.34-3.66 = Moderate; 3.67-5.00 = High. According to this categorization scheme, 3.92 = High, 3.74 = High, 3.12 = Moderate, and 4.02 = High. The terms "positive," "moderate," and "high concern" have been used in the manuscript.

Common Method Bias

Since all the substantive measures were gathered in the same way using the same questionnaire at approximately the same time, it may lead to common method bias, as the respondents' general response tendency influences the relationships among the constructs. The supplied manuscript lacks any test for common method bias, e.g., the Harman single-factor test. The revised manuscript acknowledges this source, same-time, same-source self-report bias as a limitation, not as the statistically eliminated one.

Ethical Considerations

The participants were informed about the study's purposes, the voluntary nature of their participation, and confidentiality of the collected information. No personally identifiable information was collected, and results were reported in aggregated form. Since the teachers may reasonably fear that their negative responses would be interpreted as criticism of their schools or the whole education system, the line between research and inspection should be maintained at all stages of the process.

IV. RESULTS

Table I: Respondent Profile

Variables	Category	n	%
Gender	Male	60	50
Gender	Female	60	50
Age	23–30	28	23
Age	31–40	42	35
Age	41–50	31	26
Age	51–54	19	16
Experience	1–5 years	22	18
Experience	6–10 years	34	28
Experience	11–20 years	41	34
Experience	>20 years	23	20

Equal gender distribution is due to the stratified sampling design, and not the district teacher population's actual gender distribution. This fact is important to keep in mind when interpreting gender comparisons: the study was designed to ensure the equal gender representation, not to estimate the district's teacher population by gender.

Mean-Score Interpretation

The study uses the following interpretive categories: 1.00-2.33 = Low; 2.34-3.66 = Moderate; 3.67-5.00 = High. These interpretive categories are specific to this manuscript and are not intended to be considered as universal threshold values.

Table II: Teachers' Attitudes Towards AI

Item	Agree/Strongly agree	Neutral	Disagree/Strongly disagree	M	SD
AI improves teaching effectiveness	74%	16%	10%	—	NR*
AI enhances student engagement	68%	20%	12%	—	NR*
AI supports personalized learning	70%	18%	12%	—	NR*
AI simplifies assessment and grading	71%	18%	11%	—	NR*
Overall attitude scale	63% positive	22% neutral	15% negative	3.92	NR*

*SD = cannot be calculated from the aggregate percentages provided in the manuscript. Respondent-level scores are necessary to calculate an accurate standard deviation.

The teachers demonstrated rather positive attitudes towards AI. The majority agree or strongly agree with the statements that AI increases teaching effectiveness (74%), enhances student engagement (68%), allows personalization (70%), and makes assessment easier (71%). The reported aggregate mean, $M = 3.92$, falls into the High category. Moreover, the document states that 69% have positive attitude towards AI, while 12% have negative attitude. The figure should be disclosed if the scoring rule is described in the data.

Table III: Teachers' Readiness for AI Integration

Item	Agree	Neutral	Disagree	M	SD
Ready to use AI tools	66%	18%	16%	—	NR*
Possess basic AI skills	52%	20%	28%	—	NR*
School supports AI integration	60%	19%	21%	—	NR*
Access to technological resources	49%	22%	29%	—	NR*
Willing to attend AI training	78%	12%	10%	—	NR*
Overall readiness	61% high; 23% moderate; 16% low	—	—	3.74	NR*

It is a multi-faceted concept, not an attitude. Most of the teachers reported being ready to use AI (66%), have basic knowledge of AI (52%), have support from their schools (60%), have appropriate technological resources (49%), and would be ready to attend AI training (78%). The mean readiness score was $M = 3.74$ and, therefore, fell into the High range according to the interpretative scale used in this research. The composition of responses is more important than the sum score. On the one hand, the psychological and motivational components of readiness look very positive: 78% are willing to attend training, and 66% are ready to use AI. On the other hand, the structural and capability components of readiness look much less optimistic: 52% possess basic AI skills and 49% have appropriate technological resources. The previous classification into high readiness (61%), medium readiness (23%), and low readiness (16%) is maintained as previously stated; however, the precise threshold values for each classification should be specified in the coding procedure.

Table IV: Concerns and Perceptions Regarding AI's Role

Item	Agree	Neutral	Disagree	M	SD
AI will replace teachers	49%	20%	31%	—	NR*
AI reduces teacher importance	44%	25%	31%	—	NR*
AI is too complex for classroom use	36%	22%	42%	—	NR*
AI reduces human interaction	53%	17%	30%	—	NR*
AI is only useful in developed countries	39%	20%	41%	—	NR*
Overall concerns/perceptions	—	—	—	3.12	NR*

The items "AI is too complex for classroom use" and "AI is only useful in developed countries" are not considered as misconceptions. They are considered as attitudinal concerns and, in a future revision of the instrument, should be separated from beliefs about teachers' future professional roles. The revised wording does not label respondents' beliefs as misconceptions. The majority of teachers agree that AI can replace teachers (49%), reduce the importance of teachers (44%), be too complex for classroom use (36%), reduce human interaction (53%), and be useful only in developed countries (39%). The reported aggregate mean, $M = 3.12$, was in the Moderate range.

Table V: Perceived Barriers to AI Adoption

Barrier	Agree	Neutral	Disagree	M	SD
Lack of AI training	82%	8%	10%	—	NR*
Poor internet connectivity	76%	10%	14%	—	NR*
Limited technological infrastructure	71%	12%	17%	—	NR*
Lack of technical support	68%	15%	17%	—	NR*
Ethical and privacy concerns	57%	18%	25%	—	NR*
Overall barriers	—	—	—	4.02	NR*

The barriers were reported strongly. Lack of AI training was the most frequently reported barrier (82%), followed by poor internet connectivity (76%), limited technological infrastructure (71%), lack of technical support (68%), and ethical and privacy concerns (57%). The reported overall mean was $M = 4.02$ and, therefore, was in the High range.

Table VI: Inferential Comparisons: Data Verification Status

Requested comparison	Required data	Status
Gender: independent-samples t-test $\times$ 4 outcomes	Individual or gender-specific scale scores	Not computable from supplied manuscript
Age: one-way ANOVA $\times$ 4 outcomes	Individual or age-group scale scores	Not computable from supplied manuscript
Experience: one-way ANOVA $\times$ 4 outcomes	Individual or experience-group scale scores	Not computable from supplied manuscript
Effect sizes/confidence intervals	Group means, SDs and sample sizes	Not computable from supplied manuscript

The reviewer requested the independent-samples t-tests for gender and one-way ANOVAs for age and teaching-experience groups across all four outcome scales. These analyses are correct in principle, but they require respondent-level scale scores. The supplied manuscript only includes aggregate percentages and overall means. It does not include gender-specific means and standard deviations, age-group scale scores, experience-group scale scores, and the whole $120 \times$ item dataset. As a result, the valid t , F , p , confidence-interval, and effect-size statistics cannot be recovered. No inferential statistics have been made up in this revision.

Summary of Findings

According to the descriptive statistics presented in the paper, the results revealed a mixed and somewhat inconsistent picture. First of all, it appears that the teachers are quite receptive to the educational value of AI. However, their readiness to implement AI in practice looks rather vague, except for the willingness to attend training courses. Concerns about the professional and social roles of AI, as well as the barriers to its adoption, are evident.

V. DISCUSSION

Attitudes Towards AI

The reported attitude mean score of 3.92 suggests that teachers in the sample have predominantly positive attitudes towards the value of AI in the educational process. The individual item-level responses support this conclusion, as between 68% and 74% of the sample agreed that AI has the potential to increase teaching effectiveness, engagement, personalization of learning, or assessment. These results are in line with emerging evidence from Pakistan that teachers find ways to apply AI in education (Ahmed et al., .2024; Jaffar et al., 2024). In addition, these findings are consistent with the international literature on technology acceptance that puts the emphasis on the usefulness factor (Davis, 1989; Zhai et al., 2021). This finding should be considered carefully. Although the teachers' attitudes were predominantly positive, the study did not examine their actual implementation of AI in teaching, as no classroom observations were conducted.

Readiness: Willingness Is Not the Same as Capacity

Perhaps, the most intriguing finding is the discrepancy in readiness results. Nearly four out of five teachers reported willingness to attend AI training; however, less than half reported having basic AI skills, and even fewer reported appropriate access to technological resources. This finding reveals that the motivation and enabling conditions move at different paces. This is a significant finding from the policy perspective. It appears that a training course would attract participants due to teachers' desire to learn something new, but a training course alone would not solve the connectivity problem. Provision of the devices would not help either, since without training, teachers would not be able to evaluate the results of AI tools. Thus, the appropriate strategy would be to adopt a combined approach.

Concerns and Perceptions

Responses related to teacher replacement and human interaction should be considered as professional concerns. Nearly half of the teachers agreed that AI might replace teachers, and over half agreed that AI decreases human interaction. This finding should be considered carefully rather than criticized. These concerns pose important questions about which activities must remain human, how the use of AI changes teachers' professional responsibility, and how AI affects meaningful interactions in the school environment. At the moment, the mainstream literature considers AI as an augmenting tool rather than a replacement tool. For example, the importance of human agency, professional judgment, and responsible use of AI is emphasized by Holmes et al. (2019) and UNESCO (2023). Selwyn (2019) cautions against the simplistic narratives assuming that automation always leads to improved education.

Barriers and the Ziarat Context

Training was the most frequently reported barrier, followed by internet connectivity, technological infrastructure and technical support. These findings fit into the broader picture of education in the province, where the official EMIS continues to track school facilities, infrastructure, teaching and learning environment, and professional development. The province's educational system understands the multilayered nature of the quality of schooling that goes beyond enrolment or number of schools (Government of Balochistan, 2024). The local context is crucial since the adoption of technology depends on the factors beyond an individual's control. In case the teacher has no reliable connection, shared devices are not available, or no one can help with the issue, even a very high perceived usefulness of AI cannot lead to actual use. This corresponds with the emphasis on facilitating conditions put forward by UTAUT (Venkatesh et al., 2003).

Attitudinal and Infrastructural Conditions

As stated above, the earlier manuscript suggested that the implementation would "depend less on teacher acceptance and more on infrastructure/training". This comparative statement was removed from the paper. As the results show, there is no evidence provided about the relative predictive weights. Therefore, the most careful conclusion to draw now is that both conditions are relevant. The teachers exhibited positive attitudes and at the same time encountered constraints related to skills, connectivity, availability of resources and support. Future research should test whether the two conditions have different predictive links with the adoption intention or use.

Interpretation through TAM and UTAUT

The interpretation through TAM is directly related to the attitude items on teaching effectiveness, engagement, personalization, and assessment. These items resemble perceived usefulness as they measure whether AI helps with work-related issues. Thus, the positive attitude mean of 3.92 can be considered the evidence of perceived educational value and not of formally defined TAM perceived usefulness. UTAUT can be interpreted through the items related to readiness and barriers regarding the school support, technological resources, training, connectivity, and technical assistance. These items resemble facilitating conditions. For example, only 49% of the respondents stated that they had enough technological resources and 82% identified lack of AI training as a barrier. Once again, this is the alignment of the concepts, not evidence of the tested and validated UTAUT model. The item measuring readiness to use AI can be interpreted as the indicator of behavioral readiness. Willingness to attend training sessions can be interpreted as the indicator of willingness to gain the necessary skill. Finally, the concerns scale needs to be interpreted as an additional contextual domain affecting perception of AI.

Contribution to Pakistan and Balochistan

The value of the study is in its context. Despite the fact that recent studies on teachers' acceptance and use of AI have been conducted in Pakistan, many of them are focused on universities or cover large samples. In contrast, this study reveals the use of AI by teachers in the governmental secondary school in Ziarat. It does not mean that Ziarat is the representative of all rural areas in Pakistan. This study gives a district-level case of Balochistan, which will contribute to further research.

Practical Implications

These results point to certain steps. Firstly, there needs to be a teacher training focused on their actual work: lesson planning, providing feedback, preparing differentiated materials, helping with assessment and critically

evaluating the generated content. Secondly, there needs to be a strategy for schools without the required internet connection and devices. Thirdly, the school administration needs to establish the rules about the permissible AI use, privacy, and content verification. Finally, any pilots must be carefully managed before the implementation in the district.

Implications

- For teachers: Professional development should be practical, iterative and classroom-oriented. The teachers should be taught how to analyze the output of AI, protect privacy, detect disinformation, interact with AI in a proper way and not use AI.
- For school leaders: School leaders will be able to facilitate the process by clarifying what the appropriate use of AI is, protecting teachers experimenting with AI from unnecessary disciplinary action, determining their training needs and handling technical issues.
- For the provincial education system: AI preparedness should be incorporated into general planning for digital education. Issues of infrastructure, connectivity, training and ethics should be handled simultaneously. The current infrastructure of EMIS system can be helpful in evaluating school-level AI preparedness over time (Government of Balochistan, 2024).
- For teacher education institutions: The teachers should become literate in AI within the framework of pre-service and in-service teacher education. The teachers need to master not just certain technologies but also make pedagogical and ethical decisions related to AI use.

Recommendations

- To develop a practical AI professional development program at district level for secondary teachers with follow-up rather than single workshops.
- Evaluate the connectivity, availability of devices and the needs for technical support at school level before implementing AI.
- Prepare clear guidelines on privacy protection, verification, authorship, assessment integrity and responsible use of generative AI.
- Start with small-scale pilot projects at selected schools and evaluate their implementation before implementing AI in all district schools.
- Organize peer groups where teachers share their experiences of using AI in class, problems and safeguards.
- Develop low-bandwidth or offline versions of AI tools so that unreliable connectivity does not prevent AI-based professional development of teachers.
- Include AI literacy in the provincial framework for teacher education and professional development.
- Conduct the same survey again using the properly documented sampling frame and respondent-level data so that gender, age and experience differences could be statistically tested.

Limitations and Future Research

There are several limitations to be considered. First, the study is limited to the secondary school teachers in Ziarat District and cannot be generalized to other districts. Second, the study is cross-sectional and descriptive. Third, self-reports were used as measures and may differ from observed behavior. Fourth, the supplied manuscript does not include the documentation of the sampling frame, number of invitations, response rate, questionnaire language and its translation, and school location. Fifth, there is no documentation of factor analysis. Sixth, the supplied manuscript does not include respondent-level data, making it impossible to calculate SDs of individual items and compare groups using inferential statistics. Future research will be able to collect respondent-level data using a questionnaire that will explicitly map its constructs to TAM/UTAUT before data collection. The larger sample from another district will allow testing gender, age and experience differences using t-tests and ANOVA, and regression or structural modeling if the sample size allows. Interviews will also be useful, as the survey percentages cannot explain why teachers are afraid of replacement, what they mean by 'human interaction' or what training they want.

VI. CONCLUSION

The paper evaluated the attitudes, readiness, concerns and barriers to using AI among teachers in secondary schools of Ziarat District. Overall, there is neither complete resistance nor absolute readiness. What can be concluded is that Ziarat teachers seem to be interested in using AI in education, yet, their readiness is somewhat more complicated. With the attitude toward AI having a mean of 3.92, it is clear that teachers are positive about the technology. Still, their readiness, with its mean being 3.74, requires some caution since 78% are willing to get trained, 52% have knowledge of AI, 49% have proper technological infrastructure, while being worried about the consequences of using AI on job losses and personal communication. As for the barriers, they are really strong. Thus, one can state that the teachers in question are neither passive and waiters nor technophobes. They seem to be interested in the technology while understanding the possible challenges. It is important to take it into account while developing a certain policy. The next step will not be to persuade the teachers that AI is beneficial. It will be to make them capable of using it competently and responsibly under their circumstances.

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