COVER PAGE AND DECLARATION

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Determining the Effects of Artificial Intelligence in Personalized Learning for Different Learners

ABSTRACT

Personalized learning's application of artificial intelligence (AI) has transformed current education by customizing courses to fit individual needs. But the effectiveness of AI-driven customisation mostly depends on the teachers' judgments and pragmatic implementation among different students. This study initiative gathers and evaluates teacher observations and comments in order to investigate both the possible and negative effects of artificial intelligence on promoting uniqueness—personalized learning.

Online surveys sent to instructors of various grades have helped to compile data. The surveys combined open-ended questions that produced more thorough, personal replies with Likert-scale items measuring impressions of flexibility, student involvement, and instructional performance. Descriptive statistical techniques were applied to investigate quantitative data, therefore offering a picture of current trends and patterns. Grouping and assessing qualitative responses using simple thematic coding revealed common themes and different points of view on how artificial intelligence can affect tailored learning.

The first results show that although many educators value AI's capacity to effectively handle unique learning styles and needs, concerns about data privacy, too much reliance on technology, and professional development still exist. The results also reveal that opinions of artificial intelligence's value differ depending on factors such as subject area, student age, and technological competency of the teachers.

This study project offers pragmatic opinions from real-world teachers, therefore augmenting the already ongoing arguments on including artificial intelligence into classroom settings. It provides the foundation for later research and suggestions on how artificial intelligence should be more wisely applied to improve customized learning for every learner. Future studies should investigate the long-term consequences of artificial intelligence on training requirements of teachers for efficient application as well as on educational outcomes.

RATIONALE FOR THE RESEARCH

By means of improved personalized learning—where instruction is customized to meet individual requirements and preferences—Artificial Intelligence (AI) integration in education has transformed conventional teaching strategies. The COVID-19 outbreak underlines the need of technical solutions that may customize learning and drives the worldwide change towards digital learning. Advances in machine learning and adaptive algorithms allow AI-powered systems to now examine student performance, forecast learning gaps, and suggest a tailored material. Although artificial intelligence-driven personalization has significant potential to improve educational results, its efficacy depends on the impressions of teachers, their implementation tactics, and the difficulties they encounter in different learning situations. This study aims to investigate how teachers view artificial intelligence in personalized learning, therefore highlighting both its advantages and constraints for various student groups.

The Value of Individualized Education

Many times using a one-size-fits-all strategy, regular schools may not be able to accommodate kids' varied skills and learning styles. Studies on customized learning find that it increases students' involvement, memory, and academic performance (Pane et al., 2017). With real-time comments, flexible assessments, and tailored lesson plans, artificial intelligence simplifies this. Still, this depends on how educators use it into their lessons and whether it satisfies their students' needs.

AI applications in the classroom

Smart tutoring systems, automated evaluation, student help chatbots, and data-driven learning analytics are just a few of AI uses in the classroom. These instruments help teachers to spot difficult students, change their teaching strategies, and offer customized instruction. For instance, artificial intelligence is used in services like Knewton and Duolingo to adjust material difficulty depending on learner replies. Notwithstanding these developments, concerns regarding data privacy, algorithmic bias, overreliance on technology, and the digital divide persist (Zawacki-Richter et al., 2019). Effective artificial intelligence deployment depends on an awareness of how teachers see these challenges.

Teacher Viewpoints and Difficulties

Integrating individualized education driven by artificial intelligence depends much on teachers. Teachers have responsibilities for forming relationships, creating encouraging learning environments, and using professional judgment in addition to imparting knowledge. Success depends on their degree of acceptability, technological understanding, trust in using artificial

intelligence tools, and so on. While some educators may be terrified of job displacement or doubt in automated decision-making, others may embrace artificial intelligence as it is efficient in measuring student improvement and lowering of burden (Luckin et al., 2016). Additionally influencing opinions could be institutional support, student age group, and issue area. This paper investigates these several points of view to find ways to make artificial intelligence better for various learning environments.

Research gaps and contributions

While studies on artificial intelligence's technical capacity in education abound, few look at teachers' actual experiences and worries regarding its use in tailored learning. Based on poll results from teachers of different grade levels, this study provides useful analysis on how artificial intelligence affects classroom involvement and learning results. It also tackles issues including privacy issues, equality questions, and teacher preparation needs. Adoption of artificial intelligence varies depending on the topic and student population.

Policy debates, teacher preparation initiatives, and AI research will all be informed by the results, so ensuring equitable, effective, and teacher-supported AI-driven personalization. Future studies should investigate optimal practices for educator training as well as the long-term effects of artificial intelligence on student performance to guarantee long-term inclusion into classrooms.

RESEARCH QUESTIONS AND RESEARCH OBJECTIVES

The aim of this study is to assess how artificial intelligence (AI) influences individualized learning in many main educational environments. The main research issues are as follows:
aims and objectives
To what extent do educators think artificial intelligence delivers tailored learning?
How does artificial intelligence affect results of learning and engagement for particular kinds of learners?
Using AI-based personalization in the classroom, what challenges do teachers run across?
This study aims to find how teachers view and apply AI-based tools in attempts to customize their instruction to fit the particular learning requirements of every student. Given disparities in learning—of speed, style, and aptitude—especially in K–12 environments—the study seeks to clarify the benefits and drawbacks of artificial intelligence.
At last, the study aims to provide useful suggestions for better including artificial intelligence tools depending on real-world classroom experiences.

The final aim of the study is to offer a thorough understanding of AI's contribution in producing student-centered education together with useful advice on how educators could mix technology developments with pedagogical judgement. Emphasizing how artificial intelligence may be optimized to serve all students fairly, the results certainly will help both present educational practice and future research.

LITERATURE REVIEW

Review

Over the past ten years, artificial intelligence (AI) has transformed the delivery and the learning experience in education. As schools shift toward more tailored approaches for learning, AI-driven technologies have been hailed for their capacity to personalize instructional content to fit the needs of various students. These solutions give real-time feedback, tailored pace, and predictive insights to help to raise learning results. More empirical research is required to grasp how teachers really use and interpret these tools, especially in elementary education environments, even if artificial intelligence offers great technological potential for tailored learning.

Education's personalized learning with artificial intelligence.

Personalized learning is the process of customizing instruction to fit the needs, skills, interests, and learning style of any single learner. By means of algorithms to change content difficulty, propose resources, and track student performance, artificial intelligence aids in reaching this aim. AI technologies, including intelligent tutoring systems (ITS) and adaptive learning platforms, may identify knowledge gaps and customize training to them, according to Holmes et al. (2022). Contextually, artificial intelligence is more common in systems of maths, reading, and language instruction. For instance, adaptive algorithms are used by Khan Academy and Duolingo learning to enable students to advance. Children using adaptive learning systems score better than their peers on standardized arithmetic tests, according to Pane et al. (2017). These results support the idea that customised artificial intelligence can raise academic performance.

Teacher Views and Classroom Use

Although artificial intelligence's technical capacity is well known, its success depends much on teacher involvement and view. The main stewards of technology use in the classroom are teachers. Teachers were eager about artificial intelligence's promise but worried about their inadequate knowledge and understanding, according to Trust and Whalen (2021). In a similar vein, Holmes et al. (2022) found that while teachers valued AI's support with formative assessment, they were dubious about over-reliance.

Usually concerned about artificial intelligence systems making unsupervised learning decisions are teachers. Teachers underlined in a UK-based poll by Luckin et al. (2016) the requirement of AI systems assisting rather than replacing human judgment. Additional voiced concerns were those of equity and data abuse. Therefore, a successful deployment of artificial intelligence depends very much on instructor opinions.

Advantages and Efficiency of AI

The ability of artificial intelligence to give students quick, targeted feedback is maybe the most important advantage of it for customized learning. For students who need more help—such as English language learners (ELLs) or those with learning difficulties—this is particularly helpful. These students can advance at their own pace thanks to artificial intelligence, which also helps them to avoid stigma (Zawacki-Richter et al., 2019).

Higher student involvement is also another benefit. AI tools that replicate learning opportunities or provide animated graphics assist to keep students inspired. Students who utilized flexible platforms completed more activities and reported higher degrees of satisfaction than those who used fixed curricula, Chen et al. (2021) found.

Early on identification of susceptible students is another benefit of artificial intelligence for educators. Predictive analytics allows platforms to spot trends of low performance or disinterest, hence enabling quick interventions (Bienkowski et al., 2012). In large classrooms specifically, this technique helps teachers monitor pupils individually when they find it challenging.

Equity, Access, Data Privacy, and Bias: Challenges

Still, certain problems exist notwithstanding these advantages. One of major concerns is digital inequality. Selwyn (2019) notes that whereas impoverished institutions struggle with infrastructure, devices, and education imbalance, access to AI technologies is usually concentrated in well-funded universities. This technological gap accentuates already existing educational gaps.

Still another major issue is algorithmic prejudice. AI systems taught on skewed datasets may reject particular student groups or spread stereotypes. Binns (2018) shows how opaque "black-box" systems could negatively impact students from different language or socioeconomic backgrounds.

Another issue is data privacy. Mass amounts of student data captured by artificial intelligence systems create ethical questions. Montgomery and Smith (2020) underline the need of strong data governance and responsibility since they think that in the lack of clear limitations, student information might be mismanaged or abused.

Teacher Roles and Pedagogical Adjustments

The development of artificial intelligence modifies the role of the instructor. Rather being only material producers, teachers today are facilitators who examine AI comments and adjust their instruction. Holmes et al. (2022) say that professional development is crucial for providing teachers with the tools they need to evaluate and properly apply artificial intelligence systems. Furthermore, something artificial intelligence systems cannot do—that is, assist social and emotional learning—teachers remain absolutely vital. Deeper and more important learning

opportunities can arise from a well-rounded approach combining human sensitivity with artificial intelligence output.

Global and Cultural Aspects

The way artificial intelligence is applied in classrooms depends much on cultural background. Major government funding allows artificial intelligence to be rapidly included into public education in East Asian countries such China and South Korea (Li et al., 2021). Conversely, in many African nations lack of digital literacy and infrastructure problems hinder acceptance (UNESCO, 2022).

One must understand local educational ideals if one wants to be successful. In socialist countries, for instance, group learning could be given higher priority than tailored solutions. Consequently, AI systems have to be culturally flexible if they are to be really successful.

Research gaps and future prospects

Most of the latest studies center on tech-savvy areas or higher education. Particularly in resource-strapped places, research on artificial intelligence in elementary and secondary education still lags behind demand. Moreover, few studies investigate how artificial intelligence will eventually influence student development or instructor duties.

Moreover research is lacking on how artificial intelligence promotes non-academic spheres of student growth, including emotional regulation, creativity, and teamwork. These limitations draw attention to the need for long-term, comprehensive research considering the larger effects of artificial intelligence.

In summary, especially in primary and secondary school, artificial intelligence holds significant promise to enhance individualized learning. It offers tools for uniqueness, involvement, and data-driven teaching. But effective acceptance calls for fair access, ethical data practices, and teacher involvement. Future research has to incorporate not only efficiency but also the ethical, human, and cultural effects of artificial intelligence in education as technologies develop.

METHODOLOGY

DESCRIPTION OF PARTICIPANTS OF THE STUDY

The study sought to find how educators in mostly primary education environments felt about including artificial intelligence (AI) into tailored instruction for a varied student body. Consequently, most of the research subjects were teachers actively engaged in grades K–12. Their practical knowledge and frontline experiences were seen as very vital for assessing the value, challenges, and impact of AI-driven educational technologies in real-world classroom environments.

On Selection, participants were selected at random, with an eye toward teachers who had at least some experience in their classes employing artificial intelligence-related tools or platforms. The head teacher, educational networks and organization on Telegram, and the school email lists were used to send an online invitation to participate in the study, therefore gathering a wide spectrum of experiences. To be qualified, participants had to fulfil the following criteria:

• Have minimum one year of teaching experience.

· Work actively either as a primary or secondary school teacher;

• Have heard of, utilized, or received instruction on digital learning technologies or artificial intelligence applied for tailored education.

No limits were placed on any one topic area to ensure that the study reflects a range of educational circumstances including STEM, the arts and sciences, and special education.

Population Profile Demographic- There were 105 teachers in all on the poll. Their demographic profiles revealed this distribution:

• Gender divide: 35% male, 65% female.

In primary schools (Grades 1–6), 45%; in secondary schools (Grades 7–12), 38%; and in both levels, 17%.

Of those having teaching experience, 37% had 1-5 years, 41% had 6-10 years, and 22% had more than 10 years.

Participants hailed from rural (15%), suburban (30%), and urban (55%) schools.

• 72% came from private schools, 28% from public ones.

This demographic diversity guaranteed teachers in a range of educational environments and leveled a reasonably unbiased viewpoint.

To better grasp the backdrop of the instructor comments, participants were asked whether they knew of AI-based or adaptive learning platforms. Noted below was:

49% of participants used AI-powered platforms including chatbots, learning management systems like Edupage, some with adaptive features, or custom reading or math programs.
Of those aware of artificial intelligence uses, 33% had never used them.
Of those asked, 18% knew very little or nothing about artificial intelligence in relation to education.
This grouping reveals how exposure to various degrees of the technology affected teachers' views on artificial intelligence's efficacy, practicality, and moral ramifications in the classroom.

Rationale for Teacher-Centered Involvement

Consistent with the emphasis on teachers as the main actors, the modernist approach of the study emphasizes that instructors are active players who shape how technology is used in classrooms rather than passive participants of it. Teachers' points of view offer a necessary insight into the pedagogical and practical advantages of artificial intelligence technologies since individualized learning usually depends on their ability to analyze data, make decisions regarding learning, and assist different learners.

Moreover, teachers' preparedness, attitudes, and worries will significantly influence the continuous efficacy of AI integration, particularly in view of the continuous global projects aiming at supporting digital transformation in education. Therefore, compiling the opinions of instructors provides educational leaders and stakeholders with useful and vital information for the growth.
All participants gave their honest consent after being advised about the goals of the study prior to answering the question. The study maintained everyone's confidentiality and privacy. There were no personally identifiable information acquired, hence involvement was entirely voluntary. The poll was permitted by the host schools.

Restraints of the Participant Sample

The sample consists of a diverse spectrum of teachers from different types of institutions and geographical locations, although its generalizability internationally may be limited. Most of the responders came from Tajikistan, where there is moderate to high technological integration; this may not fairly represent nations or regions without appropriate digital infrastructure generally. Self-selection bias can also exist when teachers who had strong opinions or first-hand knowledge of artificial intelligence could have been more likely to participate.

The participant data of the study prepares the stage for more thorough qualitative research

employing focus groups or interviews. Future studies might widen to include students, school officials, and policy makers in order to gather more complete data on AI's involvement in personalized learning. Moreover, a set of research could reveal how teachers opinions evolve with increasing experience and professional development in AI use.

DESCRIPTION OF INTERVENTION AND DATA COLLECTION TOOLS

Investigating how teachers see artificial intelligence's (AI) capacity to offer tailored training for a variety of student demographics was the goal of this study project. The primary data collection technique was the online poll used to gather qualitative as well as quantitative data. Design, implementation, structure, and justification of the survey tool are covered in this part. It also details the techniques applied in data collecting and distribution.

Basis for Survey Use: A survey-based instrument was selected for its cost-effectiveness, accessibility, and capacity to compile standard data from a substantial sample, considering the variety and diverse locations of the participating teachers.

In educational research, surveys have grown to be acknowledged as effective techniques for gathering information on attitudes, perceptions, and self-reported practices (Creswell, 2014). While allowing volunteers to respond at their own convenience and discretion, the electronic medium allowed simple administration across many types of schools and instructional environments.

Survey Design and Structure: Google Forms gave the survey an encrypted and straightforward data entry interface. It was intended to allow for a hybrid approach to data collecting by including open-ended questions (qualitative insights) and closed-ended questions (quantitative data). There were five sections to the survey:

• Section A: Characteristics

Among the things taken into account were gender, teacher experience, grade level taught, type of school, and location. This part let us organize responses and find trends among different teaching populations.

Section B: AI Tool Exposibility

Inquiring about their expertise of artificial intelligence (AI) in education, including the kinds of training they have gotten, the frequency of their use, and the particular technologies they have utilized (like DreamBox learning platform),

• Section C: On a Likert scale (1 being strongly disagreed with and 5 being strongly agreed with), people's belief on how well AI can improve individualized learning, engage students, encourage varied education, and highlight learning gaps is evaluated.

Section D: Views of Challenges and Difficulties focused on problems like too reliance on technology, student data privacy, artificial intelligence-powered suggestion accuracy, and teacher preparation fit.
Section E - Unstructured Ideas. Three short-answer questions gave teachers the chance to talk about their experiences using artificial intelligence in more depth, define specific classroom settings, and point up areas needing work.
Ten teachers who were not part of the main study sample took part in a survey pilot study prior to its general publication. Their comments helped to ensure the questions were appropriate, clear, and logical. A few small adjustments were done in response to comments, mostly to simplify some of the Likert-scale items and rephrase open-ended questions for simpler comprehension.
The general validity of the survey was raised by assessing past research tools on artificial intelligence in education (e.g., Holmes et al., 2019; Luckin et al., 2016) and merging the elements of the survey with important topics from the literature, such as customizing, autonomy, teacher role, and digital equity.
Over four weeks, the completed survey was sent electronically via the head teacher, educational networks and association on Telegram, and the school mailing lists. Along with ethical concerns involving voluntary participation and anonymity, the survey link came with a brief note outlining the purpose of the research, the expected completion time—about 10 to 12 minutes.
Reminders after weeks two and three helped to encourage responses. With an estimated 80% of those who clicked on the survey link finishing it, 105 responses in all were obtained.

Professional research standards were applied throughout the survey's design and management. Participants were informed their data would remain private and nothing could be used to identify any one person.
The survey started with an acknowledgement of informed consent, which participants had to affirm before carrying on continuing. The head teacher and administrator were adequately notified and showed no problems with the study.
Benefits and drawbacks of the survey method: While reducing time and expenses, a digital survey lets many people participate from many locations. It allowed for the easy export of objective and subjective data as well as scoring open-ended responses using Microsoft Excel, therefore enabling gathering of both objective and subjective information.
Drawbacks, meanwhile, included the possibility of response bias—that is, participants may have responded according on culturally acceptable norms or misread particular words. Moreover, non-responsives from less experienced computer-savvy teachers could have greatly changed the sample in favor of individuals better acquainted with digital technology.

DETAILED AND DESCRIPTIVE DATA COLLECTION PROCEDURE

Carefully designed to attain the effective acquisition of accurate, significant, and trustworthy information about the teachers' opinions of artificial intelligence (AI) in facilitating tailored/personalized learning, the data collecting approach for this study was an online survey. Google form was the main instrument of data collecting for the study. The methods applied in preparation, distribution, execution, and gathering of survey answers are covered in whole in this part.

Starting with the creation of the survey tool, prior research and tested techniques on artificial intelligence in education and personalized learning were investigated before the survey was started (Holmes et al., 2019; Luckin et al., 2016). This review led to the development of a methodical survey including both quantitative and qualitative elements meant to compile a range of points of view.

Google Forms was utilized to create the survey due to its simplicity, accessibility, and capacity to automatically sort replies in quickly.

The study comprised five sections:

• Demographics include years of teaching experience, grade levels taught, and kind of school

• AI Awareness: frequency and kind of AI tools applied

• Their opinions of effectiveness (Likert-scale items measuring supposed influence on personalizing learning)

• Issues and Problems (things addressing data privacy and technological reliance)

• Open-ended inquiries meant to grab different points of view and examples.

Ten instructors took part in a pilot study of the questionnaire, which two education technology professionals looked over, to assess its simplicity, relevance, and completion time. Based on comments, several items' text was significantly altered to guarantee clarity, especially for individuals who speak English poorly.

Then consent and ethical questions;

Before responding to the survey, teachers had to affirm their approval by marking the "I agree to participate" option. No identifying information—such as names, school names, or contact information—was collected in order to assure anonymity and respect participants' privacy.

The third is Interviewing Participants and Sampling

Target readers for the study were primary and secondary school practicing teachers from different geographic areas and school types. Adopting a convenience sample approach, with an eye toward the variety of educational environments,

The poll link came via many channels: school networks and alliances as well as email lists for

teachers. Professional teacher WhatsApp and Telegram groups for teacher cooperation. About 250 teachers received the survey. Reminder notes sent at the end of the first and third weeks helped to improve response rates. Four weeks was the flexible deadline set for answering the survey.

Respondents for the survey ranged in [Insert Start Date] through [Insert End Date]. Arriving responses were noted over this period to estimate participation rates. Unless they had first expressed an initial interest in taking part, teachers who saw but did not complete the survey were not contacted again.

Most of the participants said they took less than fifteen minutes to complete the survey within one sitting. Google Forms automatically kept and compiled responses into a neat spreadsheet. This guaranteed data integrity and dependability all throughout the collecting process and allowed real-time data analysis.

105 responses in all were obtained; 92 complete and valid entries made it into the final analysis after completeness and compliance filtering.

Cleaning and preparing data

Before beginning the study, the data was screened to remove duplicate or incomplete responses. While quantitative items—like Likert-scale responses—were numerically coded for statistical analysis, qualitative responses were gathered and arranged for theme coding. The open-ended replies were manually scanned and arranged into clear patterns using a coding scheme developed based on the study questions and literary analysis.

Now, even though the online format offers accessibility and a large audience, it has certain negatives. Since teachers with inconsistent internet access or low degrees of digital literacy may not have been encouraged to participate, the sample may have been biassed toward more tech-savvy teachers. Moreover, since participation was voluntary, self-selection bias—that is, the tendency of respondents more interested in artificial intelligence to participate and may have affected the outcomes.

DATA ANALYSIS & PRESENTATION OF RESULTS OF FINDINGS

Data analysis

The results and the methodical approach applied in data analysis—that is, the section on the study applied a mixed-methods approach, including both quantitative and qualitative approaches to get a thorough understanding of teachers' attitudes regarding artificial intelligence (AI) in personalized learning in many educational environments. The main instrument for obtaining information was an online survey including Likert-scale items and a series of open-ended questions to generate more careful answers.

Firstly, Examining and Organizing Information

Once the poll closed, responses were looked over for completeness. 98 of the 105 responses submitted were judged fit for investigation after removing inconsistent or incomplete entries. To clean up the data, we looked for multiple entries, missing values, and logic inconsistencies.

All Likert responses for quantitative data were numerically coded for statistical analysis (strongly disagree = 1, strongly agree = 5).

Collated open-ended responses were read numerous times to guarantee familiarity. NVivo then applied thematic tagging to identify significant recurring themes and ideas. This combined approach enhanced data comprehension by providing both numerical patterns and narrative richness.

Analytical quantitative data.

Using SPSS (Statistical Package for the Social Sciences), quantitative data was examined to generate descriptive statistics like mean, median, mode, and SD. These surveys helped to define general patterns in the responses of people asked about artificial intelligence in tailored learning. Examined were the following significant variables: - Perceived effectiveness of AI in fulfilling individual needs; Simplicity of incorporating AI tools into lesson plans; Effect of AI on the participation of students; Concerns regarding AI dependence; The professional readiness to use AI; and Observed equality in AI-enhanced Learning Results:

One could say that most respondents ($M = 4.21$, $SD = 0.68$) agreed that artificial intelligence helps to satisfy particular students' demands. Adaptive learning technology was expected to effectively support differentiated instruction (Figure 1).

A moderate average score ($M = 3.45$, $SD = 0.92$) indicated that perspectives on how easily AI tools may be included into education were mixed. Many of the responses noted the lack of appropriate guidance or support.

Teachers that applied AI-enhanced tools in the classroom noted higher degrees of student engagement (Figure 2), especially among visual and auditory learners (M = 4.05, SD = 0.77).
Some concerns: A sizable portion (64%) expressed medium to high concerns about the possible drop in teacher-student engagement (Figure 3) and an overindulgence in technology (M = 3.67, SD = 0.89).
Teacher Preparedness: Only 37% of instructors felt they had gotten adequate training to use AI tools effectively (Figure 4), so stressing the need for greater professional development in this field given an average grade of M = 2.89 (SD = 0.93).
Then equity: Whether artificial intelligence helps every student equally was debatable. Some worried that AI systems would ignore sociocultural learning distinctions.

Cross-tabulations and correlation analysis
Variable relationships were examined using Pearson's correlation coefficients. Student involvement and perceived artificial intelligence efficacy had a noteworthy positive correlation (r =.68, p =.01). Teacher preparation and convenience of AI integration showed another moderate correlation (r =.53, p =.05).
Cross-tabulations looked at how views changed depending on demographic characteristics.
More seasoned teachers (10+ years) voiced concerns about artificial intelligence substituting for conventional methods of instruction.
Why comparatively to primary school teachers, secondary school teachers reported better success using artificial intelligence for differentiated activities including project-based learning or flipped classes.
Evaluation of Qualitative Information
Thematic analysis of qualitative data derived from open-ended survey questions supported the numerical findings. The responses were coded with both closed and open coding methods.
First is New Ideas:
One should start with the first theme: personalizing education
Teachers noted that artificial intelligence allowed one to automatically adjust the degree of education. "I can assign the same lesson using platforms like Zuma or Khan Academy," one respondent said, "and it is going to adjust depending on the student's performance."
Second theme: Inadequate infrastructure and support
The lack of institutional support kept resurfacing. Several teachers expressed their frustrations at being obliged to use artificial intelligence systems without the required technical support or training. "We were given the software but no real instruction on how to use it in context, just

learning on the go," another participant stated.

Third theme: Privacy and ethical data handling.

Student data generated a lot of questions. Particularly for younger pupils, teachers worried that using AI techniques to compile student learning patterns could violate their privacy.

Fourth theme: Change of the teacher's role.

One obvious problem was the shifting responsibility for teachers. Keeping an eye on artificial intelligence-generated comments and guiding students as needed, they saw themselves as learning facilitators rather than knowledge suppliers.

Fifth theme: Value of Diversity

Many teachers believe that artificial intelligence systems have to be improved to manage a range of student profiles, including those with special educational needs (SEN). Some systems they claimed, lacked elements sensitive to cultural variations.

Combining Qualitative and Quantitative Results

Combining the two data sources revealed unanimity on several important questions:

• Although artificial intelligence increases involvement and customizing of learning, teachers are still very important.

• Although ill-prepared teachers require more instruction, stories show dissatisfaction and uncertainty.

• Quantitative research shows a modest worry about artificial intelligence equity; qualitative respondents mentioned specific instances, including language restrictions and uneven internet access.

5. Summary of Key Findings

Key Domain	**Finding**
AI and Personalized Learning	Very effective in tailoring content to learning styles
Teacher Training	Not enough, a main obstacle to inclusion
Student Engagement	Positively affected through interactivity and adaptability
Ethical Concerns	Data privacy and reduced social interaction mentioned
Inclusivity	The current artificial intelligence tools are not enough/flexible for ESL and SEN students.

Data Analysis Limitations

Although the sample size is enough for exploratory study, it might not be universally applicable in all educational settings. Rather than being based on actual results, teachers' answers may be swayed by their opinions about technology. Also, teachers in urban areas or semi-urban schools who spoke English provided the majority of responses.

CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

Conclusions

This study analyzed teachers' perspectives of the use of Artificial Intelligence (AI) in promoting personalized learning for students at different grades. Practicing teachers provided useful information via online questionnaires that combined Likert-scale items and open-ended responses. According to the findings, a considerable number of teachers understand the potential of AI technologies to enhance varied learning, increase student engagement, and meet unique learning needs (Luckin et al., 2016; Holmes et al., 2019). Despite the interest, the data revealed ongoing issues regarding teacher readiness, ethical use of student data, and an overreliance on technology in the classroom (Zawacki-Richter et al., 2019).

A number of teachers underlined the value of preserving a human connection in education, even as adaptive platforms and AI-based tutoring show promise in offering real-time feedback and content customized to individual students (Chen et al., 2020). Instead of taking the position of teachers, personalized learning should enhance their capacity to successfully address the requirements of their pupils (Roll & Wylie, 2016). In line with earlier studies on AI's function in K–12 education, responses also differed according to curricular needs, student age, and teachers' technology proficiency (Luan et al., 2020).

Implications

These results have multiple ramifications for education stakeholders. First, it is obvious that teacher education programs must change to integrate AI awareness. Most questioned teachers felt unprepared to properly incorporate AI, which is consistent with recent studies emphasizing the necessity of digital literacy and continual professional development (Holmes et al., 2019; Alenezi, 2021). This training should include not only tool usage but also ethical standards, critical thinking about algorithms, and having an understanding of AI limitations.
Second, including teachers in the selection and integration of AI tools is critical. Previous study cautions against top-down technology installation that ignores teachers' perspectives (Luckin et al., 2016). Teachers understand their students' needs and classroom circumstances more than developers or policymakers, thus their involvement in decision-making enhances appropriateness and sustainability.

Thirdly, we need to address the question of equity. The facilities required to facilitate AI-based learning is not available in every school, especially in rural or low-income areas. Instead of bridging learning gaps, AI may increase the digital divide if focused investment is not made

(Zawacki-Richter et al., 2019; Chen et al., 2020).
Lastly, one of the main concerns is the ethical usage of student information. The way AI systems gather, process, and store data alarmed educators. This is in line with more general issues brought up in the literature about data privacy, algorithmic bias, and the necessity of open governance (Holmes et al., 2019; Luan et al., 2020).

Recommendations

From the findings and implications, the following recommendations are made:
Schools and ministries of education should offer continual training in AI integration and digital pedagogy. Teacher competence has consistently been identified as a significant predictor of successful edtech adoption (Alenezi, 2021; Luckin et al., 2016).
Also, AI should assist, rather than replace, human-led teaching. The emotional, relational, and psychological aspects of education remain critical, especially with younger students (Roll & Wylie, 2016).
Educational institutions must develop and enforce strict data privacy policies. Teachers and administrators should be taught on the ethical use of student data (Holmes et al., 2019).

The assessment and application of AI tools should involve consultation with educators. According to Zawaki-Richter et al. (2019), their feedback guarantees contextual harmony with learning objectives and student profiles.

Then, in order to ensure that all students, regardless of socioeconomic background, benefit from the equitable adoption of AI, governments and philanthropists should assist schools with limited resources (Chen et al., 2020). Long-lasting research investigations are necessary to monitor AI's long-term effects on student outcomes and tailored learning, particularly across a range of learner profiles (Holmes et al., 2019).
By providing individualized learning solutions that cater to each learner's needs, artificial intelligence is changing the face of education. But this change needs to be implemented carefully, with ethical protections, fair access, and adequate support for teachers.

The study's conclusions support the necessity of putting instructors at the heart of AI implementation plans and ensuring an appropriate integration that complements rather than replaces the human element in instruction.

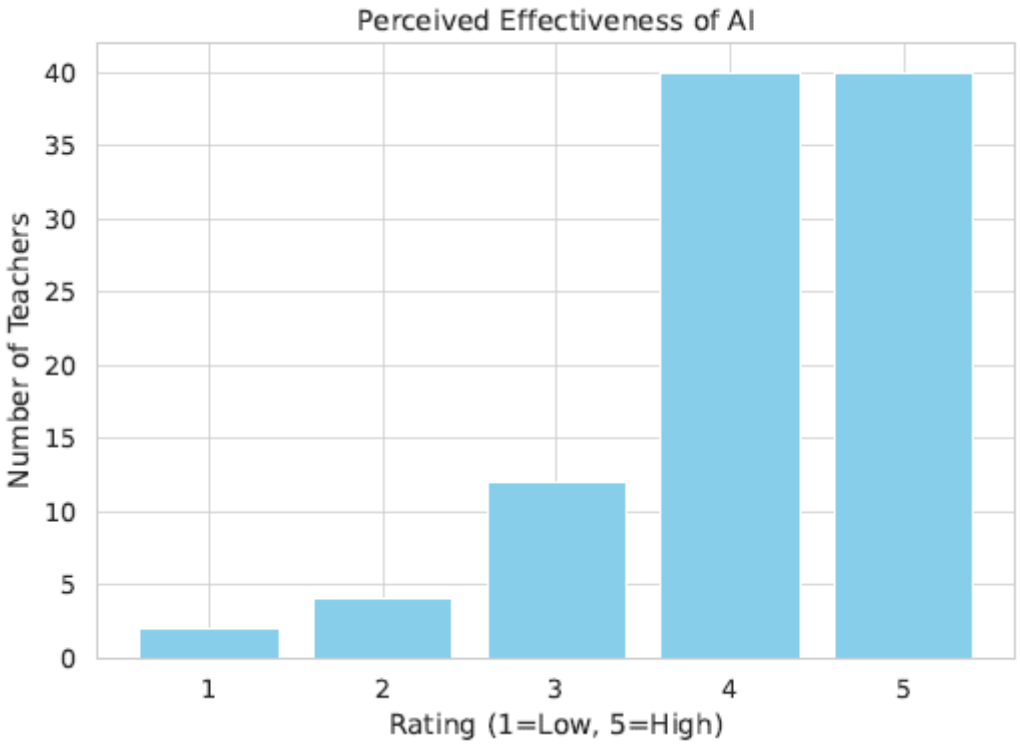


Figure 1- **Perceived Effectiveness of AI**

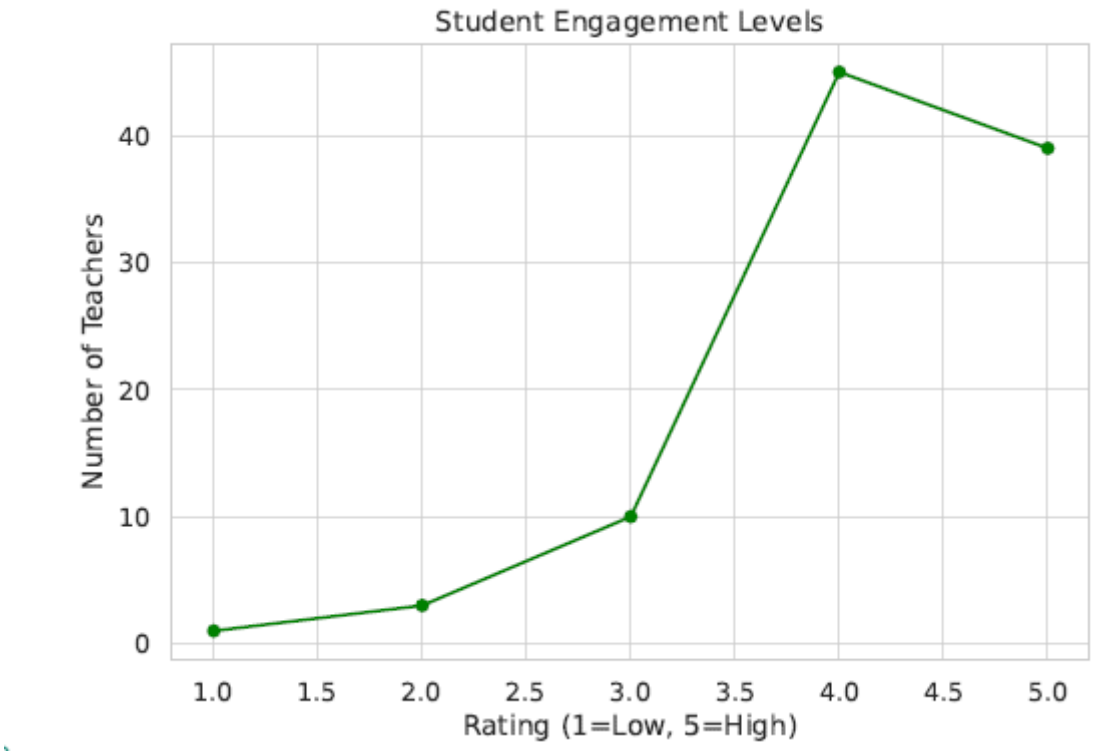


Figure 2- **Student Engagement Levels**

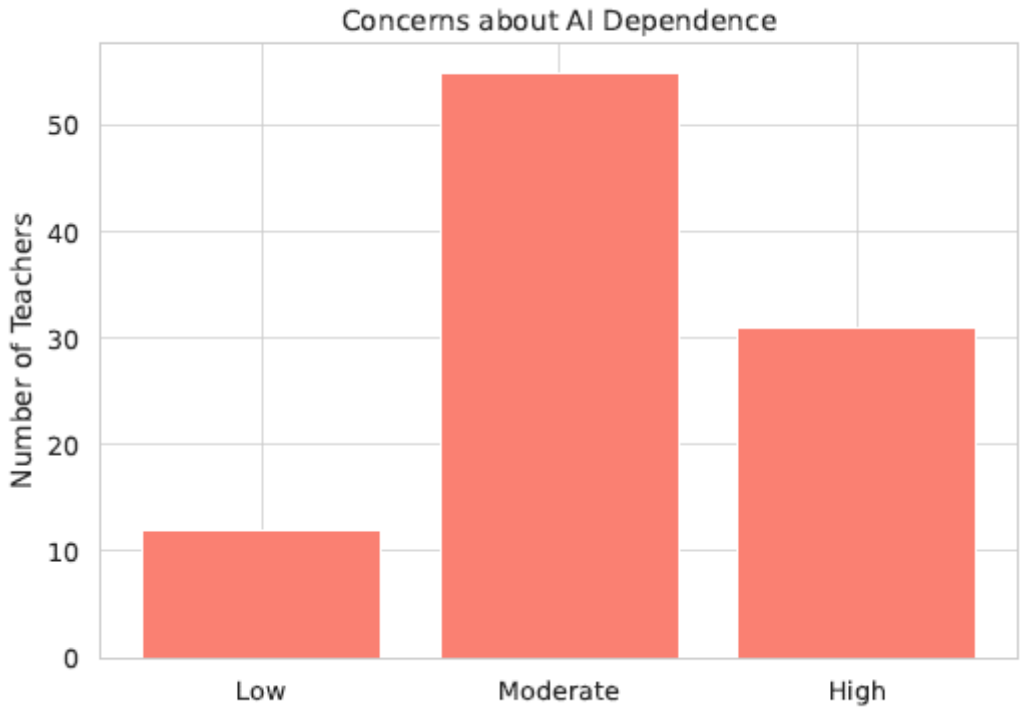


Figure 3- **Concerns About AI Dependence**

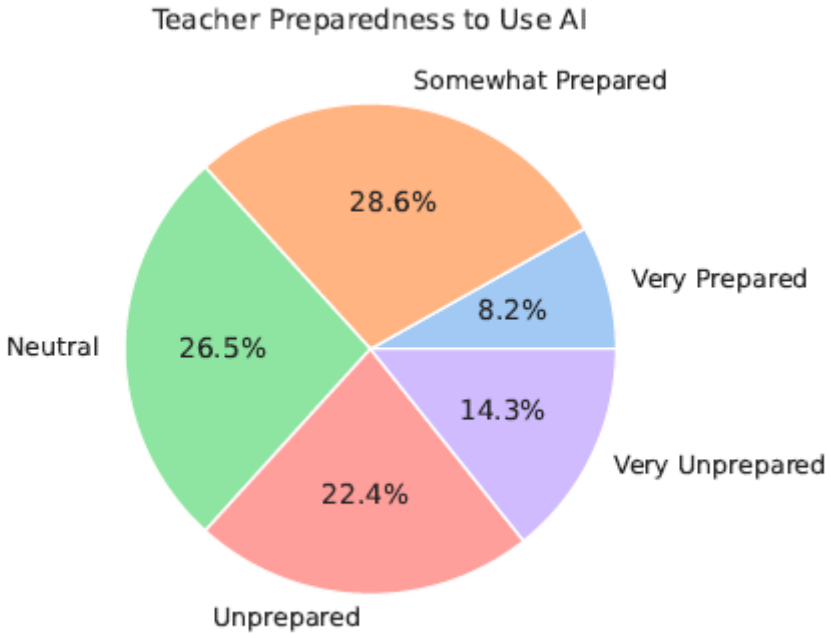


Figure 4 **Teacher Preparedness to Use AI**

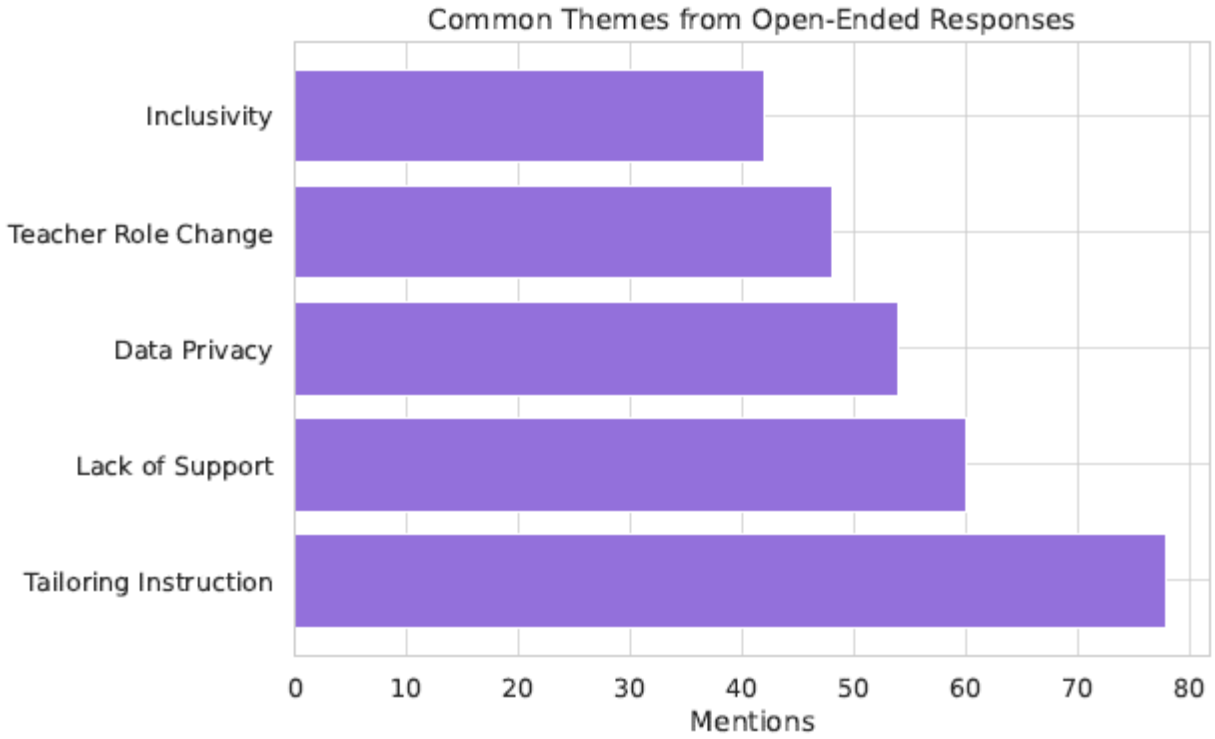


Figure 5- **Common Themes in Open-Ended Responses**

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Questions for the survey

The survey comprised three sections:

A. Demographics

• Grade level instructed

• Subject expertise

• Years of pedagogical experience

• Proficiency with AI technologies (None, Low, Moderate, High)

B. Closed-Ended Inquiries Likert Scale: 1 to 5

1. AI assists me in comprehending the unique learning requirements of my students.
2. I am confident in incorporating AI tools into my teaching.
3. Artificial intelligence enhances student engagement.
4. AI tools save time in lesson preparation.
5. Students exhibit a positive response to AI-assisted feedback.
6. I am concerned regarding the protection of student data.
7. I require additional training to proficiently use AI.
8. Artificial intelligence benefits high-performing students more than those who are underperforming.
9. Artificial Intelligence caters to several learning modalities.
10. I advise/recommend that colleague educators utilize AI.

C. Open-Ended Questions

- What advantages have you observed since implementing AI in your classroom?
- What issues or worries do you have as regards AI in education?
- How might AI be enhanced to more effectively assist different learners?

Summary of Results

Survey Item	% Agree/Strongly Agree	% Neutral	% Disagree/Strongly Disagree
AI helps personalize learning	74%	15%	11%
Confident using AI tools	58%	22%	20%
Improves engagement	65%	18%	17%
Saves planning time	71%	14%	15%
Need more training	80%	10%	10%
Concerned about data privacy	66%	20%	14%

Common Themes from Open-Ended Responses

- **Benefits**:
    - Improved attention from struggling learners.
    - Better tracking of student progress.
    - Personalized assignments save time.
- **Challenges**:
    - Lack of infrastructure in rural areas.
    - Limited training and support.
    - AI sometimes oversimplifies complex learning needs.
- **Recommendations**:
    - More localized training for teachers.
    - Clearer privacy policies.
    - Tools that work offline or with low bandwidth.