# Factors Influencing Teachers' Use of Artificial Intelligence for Instructional Purposes

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## Abstract

The current paper examined the impact of a set of individual, technological, and institutional variables on the adoption of artificial intelligence (AI) among teachers at private schools. The rationale for this study lies in its contribution to the understanding of how teacher characteristics, institutional support, and technological perceptions affect AI adoption in educational settings. The study used data collected from teachers (*n*=306) from seven schools located in Azerbaijan in 2024. The study suggested that perceived usefulness of AI increases teachers' use of AI for educational purposes, while perceived ease of use of AI has no statistically significant impact. The study also documented a statistically significant link between institutional policy and the use of AI by colleagues on the one hand, and AI adoption among schoolteachers on the other. Finally, the study found evidence relating to the link between AI adoption and the age of the teacher, such that teachers who are younger were more likely to adopt this technology. Surprisingly, personal innovativeness and level of openness to new experiences did not stimulate teachers to adopt AI for teaching. The findings contribute to improving the field's understanding of teachers' attitudes and motivations for using AI for instructional purposes. The study findings also highlight the role of administrative regulation and school policies in stimulating the adoption of new technologies. These findings contribute to relatively novel literature relating to the application of AI in education and provide useful recommendations for administrators of educational institutions.


*Keywords*: artificial intelligence, education, personality, technology acceptance, technology adoption innovativeness

Whilst the rapid advancement of technology continues to change the educational landscape, artificial intelligence (AI) is becoming a major influence on the methods and outcomes of education. The introduction of AI in teaching and learning processes presents numerous opportunities for improving efficiency in content delivery; however, AI should be implemented based on consideration of both technological and human aspects. The Technology Acceptance Model (TAM), designed by Davis (1986), provides an effective model for predicting the extent to which technology is accepted by educators. This model envisions perceived usefulness and perceived ease of use as key components influencing technology acceptability, which are particularly relevant when discussing the incorporation of AI in education (Davis & Granić, 2024).

The acceptability and application of AI in educational contexts are influenced by personality qualities articulated in the Big 5 model (Kaya et al., 2022; Sánchez-Prieto et al., 2019; Seibert et al., 2021; Sindermann et al., 2022; Stein et al., 2024). The Big 5 model categorizes personality traits into five broad dimensions: openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism. These attributes define how a person would react to change and new technologies, and, therefore, how they would approach AI tools when the latter are introduced into their teaching environment. According to Kaya and colleagues (2022), characteristics such as openness to experience and conscientiousness can have a substantial impact on a teacher's readiness to incorporate new technologies, such as AI, into their teaching practices. These characteristics influence how educators see the potential benefits and usefulness of AI tools, determining their readiness to adopt such technologies. The Big 5 traits provide comprehensive knowledge of the psychological aspects that might support or hinder technological transition in education, meaning that individual personality differences must be considered when devising targeted interventions to boost AI adoption (Stein et al., 2024). This psychological preparedness is vital since it complements the practical needs and pressures that educators face in their professional orientation.

In the context of education, teacher burnout has persisted as a major issue affecting teachers in the course of time and poses several implications for their willingness to accept and incorporate technological teaching aids into their teaching process (Sindermann et al., 2022). Researchers argue that teachers often work under pressure and stress originated from administrative tasks, as well as the urge to address students' individual learning needs, which can be aggravated by limited administrative support systems (Arvidsson et al., 2019). These practices can result in a high level of stress and burnout among teachers, therefore inhibiting their ability to perform effectively and foster a positive and constructive learning atmosphere. AI technologies may help reduce some of these stressors due to the adoption of new technologies and automation of processes which would improve the experience and work satisfaction of teachers, thereby promoting job retention, improved quality of teaching, and improved outcomes for students (Haleem et al., 2022). For instance, AI can aid in effective performance and individual assessments, thus minimizing the amount of work in this area of teachers' day-to-day activities and helping them focus on the teaching process and its effectiveness.

Thus, schools should prioritize the development of clear policies and support frameworks that address the technical and pedagogical aspects of AI integration (Ding et al., 2024; Karakose & Tulubas, 2024). In turn, by creating conditions for positive attitudes towards and usage of technologies in general and AI in particular, school leaders and administrators may enhance teachers' professional practice and expertise, hence, improving their students' outcomes.

The need to integrate these technological innovations in educational settings underlines the urge for proper policies at schools regarding the application of the technologies. Such a proactive approach will address several of the previously discussed concerns surrounding how AI can potentially reduce the workload in teaching without ever coming to fruition in practice for many teachers. For any policy to be effective, it should not only encapsulate the resolution of compatibility problems but also ensure that AI implementations are in line with education goals and aims, as well as consider teachers' needs to enable a harmonized adoption of AI to boost the teaching and learning environment (Fullan et al., 2023; Chan, 2023). This study aims to explore a range of factors affecting AI use in teaching. It does this by addressing the following research questions:

1. What is the impact of the perceived usefulness of AI technology on its adoption among teachers?
2. How does perceived ease of use influence teachers' willingness to employ AI tools in their instruction?
3. What role does teachers' innovativeness play in the acceptance and integration of AI into teaching?
4. How does openness to new experiences influence teachers' attitudes towards and engagement with AI technologies?
5. What influence do school policies have on the adoption and effective use of AI by teachers?

The significance of this research is underscored by the comprehensive analysis provided by the European Digital Education Hub's briefing reports (Le Borgne et al., 2024; Obae et al., 2024). These reports elaborate on the necessity of equipping educators with AI literacy and adapting curricula to include AI competencies as integral components of modern education. Specifically, Briefing Report 1 highlights the urgency of continuous professional development that addresses both the technological and pedagogical aspects of AI integration, ensuring that teachers are not only users but also informed implementers of AI technologies in their classrooms (Le Borgne et al., 2024). Briefing Report 4 discusses the crucial role of institutional support systems in facilitating the effective use of AI within educational frameworks. It emphasizes the importance of school policies that are flexible yet robust enough to support the dynamic nature of AI technologies, advocating for policies that can solve compatibility issues and foster an environment conducive to technological advancements and teacher acceptance (Obae et al., 2024).

The current study expands upon these premises by considering a wider range of factors affecting AI use in teaching, including teachers' traits like innovativeness and willingness to

experiment, characteristics of the learning environment, policies, and administrative support. By discussing these dimensions, this study attempted to create a bigger picture of the role that different factors are playing in the process of adopting new AI technologies in education. Thereby, it offers valuable insights for administrators and policymakers aiming to foster a more effective integration of AI in schools.

The remainder of the paper is structured as follows. 'Literature Review' develops the hypotheses. 'Data and Methodology' describes the methods of the study and data collection procedures. 'Results' presents the findings of the analysis. 'Discussion' describes the findings of the study, its theoretical and practical implications. The paper concludes with 'Conclusions and Recommendations'.

## Literature Review and Hypothesis Development

### Technology Adoption and the Use of AI in Education: The Role of Perceived Usefulness and Perceived Ease of Use

Introduced by Davis in 1986, TAM is a framework that provides a strong foundation for studying the adoption of technology in the educational landscape. This model revolves around two principal concepts that determine the attitude of educators towards accepting new technologies: perceived usefulness and perceived ease of use (Davis & Granić, 2024). In the context of AI for education, these constructs guide the evaluation of educators' judgments about what aid AI tools can bring and how they fit into current pedagogical practices (Kelly et al., 2023).

The perceived usefulness of AI in education is said to be connected to its capacity to revolutionize the pedagogical context. AI technologies, which are viewed as "an auxiliary system for education" (Uygun, 2024, p. 938), allow the education process to get more personal and optimal for achieving the utmost learning outcomes and providing space for adaptation to the individual psychological needs of students as related to "their autonomy, competence and social relatedness" (Ofosu-Ampong et al., 2023, p. 45). This also relates to the personalization of activities to reflect the specific pace and style of learning, as well as tailoring relevant constructive feedback and assessment that considers the strengths and weaknesses of individual students. It is argued that the qualities of AI, which directly support learning and teaching processes in improving student outcomes and developing "their creative ability to shape their thoughts", are useful for facilitating a more dynamic and interactive classroom environment (García-Martínez et al., 2023, p.188). Additionally, the ability of AI to reduce the amount of time spent on administrative workload related to tasks like grading or evaluating students' assignments is beneficial to the educator as it increases the amount of time that the educator spends on teaching and interacting with the student (Owan et al., 2023). The cumulative effect of these AI applications can help teachers ensure a challenging, however engaging, and positive learning environment in which both teachers and students can thrive. Through reducing burdens and enriching a positive teaching experience, AI can promote more sustainable and satisfying teaching practices.

The above arguments suggest that the perceived usefulness of AI motivates teachers to improve their teaching practices by introducing AI into the educational process. Therefore, we hypothesize that:

***Hypothesis 1:*** *a. Perceived usefulness of AI stimulates the use of AI for educational purposes*

Teacher burnout is a challenging issue in today's educational settings and is a condition of physical, emotional, and mental exhaustion that leads to negative and sometimes inappropriate responses towards students, their jobs, and colleagues in general. This occurs due to the myriad of demands that fall on teachers, which include but are not limited to administrative paperwork, constant assessment and evaluation of students' assignments, and the efforts to accommodate diverse learning types and preferences (Arvidsson et al., 2019). The increased emphasis on technology and especially on the use of AI provides the space for diminishing, or at least preventing, some of these stressors through the automation of menial tasks and simplifying complicated work processes, thus eliminating the risk of burnout (Bauwens et al., 2020). This supports the claim that AI not only empowers teaching practices but also enhances teachers' job satisfaction and their career sustainability within the teaching field. In this context, the transformation implies the introduction of AI in education by simplifying tasks and reducing workload, which naturally leads to the concept of perceived ease of use of the TAM framework, emphasizing the necessity of creating AI tools that are simple and easily adapted into the educational system.

Perceived ease of use represents the idea that teachers consider learning to use AI in their classroom practices to require minimal effort. Teachers can be more inclined to accept tools that they can easily understand or that do not require sophisticated technical skills and are compatible with the existent educational frameworks (Al Darayseh, 2023; Ofosu-Ampong, 2024). The lack of integration and noticeable gaps in how these technologies align with daily teaching activities are crucial factors in teachers' low acceptance of AI tools. The above arguments suggest that teachers are more interested in adopting AI for teaching purposes when their perception of its ease of use is high. Therefore, we hypothesize that:

***Hypothesis 1:*** *b. Perceived ease of use of AI stimulates the use of AI for educational purposes.*

**Acceptance of the AI by Teachers: The Role of Personality and Individual Factors**

The adoption of AI in educational environments is largely determined by personal characteristics (Kaya et al., 2022; Sánchez-Prieto et al., 2019; Sindermann et al., 2022). Historical shifts in education types, for example, the introduction of the internet, the rise of edtech, and the rapid pivot to online learning during COVID-19, have revealed differences in the degree of adaptability among educators (Haleem et al., 2022; Ng et al., 2023). These transformations show that some educators approach and master new technologies with ease, whilst others still have some hesitation due to their risk averse or conservative nature. Such

fluctuations in adaptation can be envisaged through the lens of the Big 5 personality dimensions. For instance, openness to experience encompasses such traits as curiosity and a predisposition to explore new things, which relates to teachers' innovativeness (Bauwens et al., 2020). Those who are high in this trait are more likely to incorporate AI technologies into their teaching practices since they are more open to change, possibly leading to more improved and efficient teaching experiences in schools.

Empirical research studies emphasize individual differences in technology adoption. Teachers with high levels of openness and innovativeness are the ones who usually experiment with new tools and are most successful in integrating these platforms into their teaching practices. As stated by Kaya and colleagues (2022) "openness to experience may increase the perceived practicality and ease of use of technology" (p. 508). Innovativeness in education is not only about technology but also about creativity in pedagogy and curriculum design that determines the direction of the evolution of educational practices (Seibert, et al., 2021).

In ever-evolving education, with advancements in technology, the importance of such personality characteristics as innovativeness in technology acceptance needs to be appreciated (Haleem et al., 2022; Sánchez-Prieto et al., 2019). This individual orientation is useful not only in understanding why some educators are better at technology-enhanced learning but also in providing a more finely tuned view of technology integration in the educational world. Therefore, we suggest that:

***Hypothesis 2:*** *a. Teacher's innovativeness is positively associated with the adoption of AI for teaching purposes.*

In examining the nature of technology adoption by educators, the Big 5 personality model, particularly the trait of openness to experiences, is rather revealing (Kaya et al., 2022; Stein et al., 2024). This characteristic encompasses the person's inclination towards innovation and their open-mindedness to the demonstration of fresh concepts and strategies that reflect their readiness to assimilate and apply AI tools in their teaching practice. (Sánchez-Prieto et al., 2019).

A high level of openness in teachers highlights their curiosity, imagination, and being broadly keen on incorporating technologies into their pedagogical repertoire (Kaya et al., 2022; Sánchez-Prieto et al., 2019; Sindermann et al., 2022). Teachers, high in openness, are often the early adopters of new technologies who explore their potential to improve learning and teaching outcomes with much more enthusiasm than their less open colleagues. The correlation of openness to technology adoption is backed by recent empirical studies indicating that the teacher's personality traits play a significant role in the process of technology integration into classrooms. One of the examples is that educational professionals with a high degree of openness are not only quick to try out new tools but are also experts in incorporating these innovations in ways that promote student engagement and outcomes (Sánchez-Prieto et al., 2019).

The openness of teachers to new experiences allows for the customization of professional development programs. Such professional development programs should be developed to cater for the needs and wants of teachers regardless of their inherent passion for new technologies and to ensure a more effective and inclusive adoption of educational innovations.

Apart from openness, the Big 5 model incorporates other personality traits such as conscientiousness, extraversion, agreeableness, and neuroticism. The conjunction of these characteristics creates a complex image of the person that influences his or her conduct in various areas of life, including professional activities (Seibert et al., 2021). Comprehending these personality-driven aspects can help in implementing focused plans for technology integration in schools. Therefore, we hypothesize that:

***Hypothesis 2:*** *b. Teacher's openness to new experience is positively associated with the adoption of AI for teaching purposes.*

**AI Adoption and Institutional Policies: The Role of Administrative Support**

The incorporation of AI into educational settings is not a mere technological innovation but an involving process that needs strong administrative support. The adoption landscape of educational technology is quite diverse, with some schools being pioneer adopters of innovative tools and methods, while others are conservative and diligent, often slowing down the technological spirit. Such differences are mostly caused by the various levels of support and promotion that educational institutions offer (Chan, 2023; Rahman & Watanobe, 2023).

Schools that are inclined to promote the implementation of innovative technologies are generally progressive organizations that consider technological innovation as a fundamental tool to improve educational outcomes. These schools invest not only in the equipment and software needed but also in a culture of continuous learning and adaptability (Fullan et al., 2023; Karakose & Tulubas, 2024). Support services in these schools include continued professional development designed to help teachers integrate new technologies effectively into their pedagogy.

On the other hand, the difficulty that schools face in implementing technology is largely due to a lack of institutional support. Under these conditions, teachers become isolated in their attempt to introduce new tools and unsure of the possible consequences of failures (Sindermann et al., 2022). Fear of failure is a detrimental factor in educational settings where innovation does not have institutional recognition. Teachers in such environments are usually unwilling to stray from the accepted norms and practices owing to job security fears, criticism, and a lack of benefit from changing their teaching styles (Roczniewska et al., 2020).

Administrative support profoundly affects this by creating an environment in which technology experiments are viewed more as learning experiences than as a threat. As long as school leaders endorse the use of AI and other technologies as part of the school vision aimed at providing

future-ready education, it creates a setting that can erase fears and excite the staff (Fullan et al., 2023; Karakose & Tulubas, 2024).

However, this supportive orientation should also entail the provision of needed infrastructure – reliable internet access, up-to-date computing equipment, and technical support – that will make the adoption of new technologies a possibility and a less intimidating process for an educator. "This attempt not only requires enabling a more digitally enhanced learning environment but also integrating these technologies to practice effective management and leadership in contemporary schools" (Karakose & Tulubas, 2024). The implementation of AI technologies into teaching and learning environments demands "school leaders to constantly adapt and expand their technological knowledge and skills simply to remain ahead of the AI curve" (Fullan et al., 2023, p. 4). Additionally, incentives and reward systems that recognize innovative teaching related practices, can motivate teachers to experiment with and embrace the use of new technologies.

Such policies help educators understand how AI tools should be integrated into the learning process and how these tools can bring about better learning outcomes among students. Clear policies aid in creating the yardsticks for success and a framework within which teachers may innovate with confidence. Administrative assistance also provides continued support through training programs that enable educators to keep up to date with technological advancements and pedagogical strategies that utilize these technologies appropriately (Bauwens et al., 2020; Ding et al., 2024; Sindermann et al., 2022). For successful AI adoption, teachers should be taught not only how to use new tools but also why these tools will improve their students' educational experiences and outcomes. Therefore, we claim that:

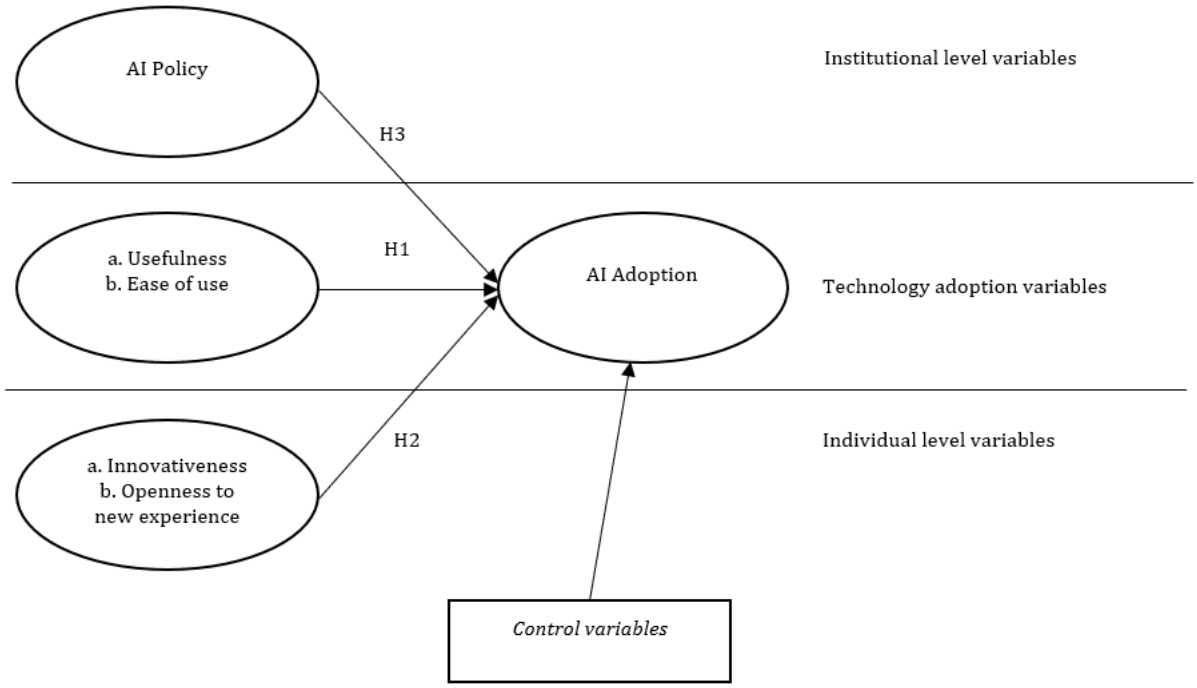
***Hypothesis 3:*** *Presence of school policy supporting the use of AI increases the use of AI for teaching purposes.*

## Conceptual Model

A review of the existing literature on the application of AI technology in education has identified a considerable gap for further investigation. Our study aims to contribute to this examination, particularly in relation to the sets of (H1) technology adoption factors (i.e., perceived usefulness and perceived ease of use), (H2) personality and individual variables (i.e., innovativeness and openness to new experiences), and (H3) institutional support (the school's AI policies). A conceptual model of the proposed study is presented in the following page.

**Figure 1**

*Conceptual Model of the Study*




## Data and Methodology

### Data and Its Collection

The study utilized a survey methodology, collecting data from teachers working at the seven largest private schools in Baku, Azerbaijan. The study's questionnaire was piloted among 12 teachers to improve its face and content validity. Then, anonymized copies of the questionnaire were distributed among all secondary teachers. The population of the study encompassed 956 teachers. The response rate comprised 32% with 310 teachers voluntarily agreeing to participate in the study. Four questionnaires were removed from the pool as they failed to answer the attention check questions correctly. Responses collected from 306 teachers constituted the dataset. Table 1 summarizes the descriptive statistics for the study sample. Ethical issues were closely followed throughout the investigation in accordance with APA 7 principles. Every participant received comprehensive details regarding the research, guarantees of their privacy and confidentiality, and knowledge of their freedom to discontinue participation at any moment without repercussions (American Psychological Association, 2017).

To further ensure the validity of the data, the following measures have been taken. Several Likert scale items have been reversed. A reliability test was conducted to measure the internal consistency of the collected data. Moreover, a factor analysis was performed to estimate whether the variables heavily loaded around a common factor.

**Table 1**

*Descriptive Statistics (n=306)*

| Variable | Range | Min | Max | Mean | SD |
|---|---|---|---|---|---|
| Gender of the respondent (GEN) | 1 | 1 | 2 | 1.58 | 0.49 |
| Age of the respondent (in full years) (AGE) | 46 | 21 | 67 | 37.56 | 8.79 |
| Highest education level (STAG) | 2 | 1 | 3 | 1.98 | 0.645 |
| Level of computer proficiency/skills (COM) | 2 | 1 | 3 | 2.76 | 0.44 |
| School policy that supports the use of AI (POL) | 1 | 0.00 | 1 | 0.31 | 0.46 |
| Use of AI by a colleague(s) (CUSE) | 1 | 0.00 | 1 | 0.73 | 0.45 |
| Use of AI by the respondent (USE) | 1 | 0.00 | 1 | 0.57 | 0.5 |
| Perceived usefulness (PU) | 17 | 4 | 21 | 17.97 | 3.05 |
| Perceived ease of use (PEU) | 21 | 7 | 28 | 24.03 | 3.36 |
| Attitude toward AI (ATT) | 8 | 6 | 14 | 11.56 | 1.92 |
| Internal Locus of Control (ILC) | 7 | 8 | 15 | 11.60 | 1.44 |
| Innovativeness (INN) | 17 | 18 | 35 | 29.34 | 4.04 |
| Hope | 11 | 10 | 21 | 18.63 | 1.93 |
| Optimism | 11 | 10 | 21 | 19.25 | 1.58 |
| Self-efficacy | 9 | 12 | 21 | 19.06 | 1.52 |
| Resilience | 11 | 10 | 21 | 17.81 | 2.75 |
| Openness (OP) | 9 | 19 | 28 | 25.67 | 1.75 |
| Psychological Capital (PSYCAP) | 42 | 42 | 84 | 74.75 | 5.98 |

*Note.* The table documents the descriptive statistics for the variables used in this paper. All variables are discussed in section 3.2. The sample period is from April to May 2024.

## Measurement and Analysis

The purpose of the study was to measure the impact of individual, institutional, and technological factors on the use of AI in educational ecosystems as posed in our main research question. Specifically, it was hypothesized that the adoption of AI technology is stimulated by (H1) the components of the technology adoption, i.e., perceived usefulness and the perceived ease of use of AI technology, (H2) the presence of an AI support policy, and (H3) individual-level variables such as openness to new experiences, innovativeness. The ordinary least squares regression equation presented below was employed to test these hypotheses.

$$\begin{aligned} \mathrm{USE} = {} & \alpha + \beta_1(\mathrm{PU}) + \beta_2(\mathrm{PEU}) + \beta_3(\mathrm{POL}) + \beta_4(\mathrm{OP}) + \beta_5(\mathrm{INN}) + \beta_6(\mathrm{SCHL}) \\ & + \beta_7(\mathrm{AGE}) + \beta_8(\mathrm{GEN}) + \beta_9(\mathrm{SUBJ}) + \beta_{10}(\mathrm{STAG}) + \beta_{11}(\mathrm{CUSE}) \\ & + \beta_{12}(\mathrm{COM}) + \beta_{13}(\mathrm{ATT}) + \beta_{14}(\mathrm{ILC}) + \beta_{15}(\mathrm{PSYCAP}) + \varepsilon \end{aligned} \quad (1)$$

In the above regression equation, the dependent variable USE represents the use of artificial intelligence technology usage by teacher for educational purposes. For (H1), we used a PU variable to measure the degree of usefulness of AI and a PEU variable to measure the degree of ease of use of AI as perceived by teachers. For (H2), we used an INN variable to measure the degree of innovativeness and an OP variable to measure the openness to new experiences

by schoolteachers. For (H3), we used a POL variable to measure whether schools have policies supporting the use of AI for teaching and learning purposes in place.

- PU – perceived usefulness factor – component of TAM (Davis, 1989). It is suggested that perceived usefulness, which can be defined as a person's perception of the degree to which technology use can improve performance, should stimulate the use of AI technology. This factor is generated using the principal component analysis and calculated as a sum of answers to three out of four 7-degree Likert scale items e.g. *I would find AI technology useful in my work.* One item was dropped as a result of the reliability test, and the calculated Cronbach's alpha for perceived usefulness was equal to 0.832.
- PEU – perceived ease of use factor – another component of the technology acceptance model (TAM) measures P the level to which a person believes that using a particular system is free of effort (Davis, 1989). This construct originates from the concept of self-efficacy, which pertains to an individual's specific belief in their ability to successfully perform actions required for a future task. Similar to perceived usefulness, a higher degree of perceived ease of use should also lead to a higher likelihood of adopting AI technology according to the TAM model. The 7-degree Likert scale items, such as *I would find it easy to get AI technology to do what I want to do* was used to measure PEU. The latent variable was generated using the principal component analysis from four 7-degree Likert scales items. The calculated Cronbach's alpha for PEU scale is equal to 0.795.
- INN – innovativeness variable was measured using an adopted scale by De Jong and Den Hartog (2008). It contained 7-degree Likert scale items such as *I systematically introduce innovative ideas into work practices*. These were grouped into a single latent variable using the principal components analysis and calculated as a sum of five variables. Cronbach's alpha for this factor is equal to 0.812.
- OP – openness to new experience variable measured using the Big 5 Personality traits scale items. It included eight regular and two reversed 7-degree Likert scale items, such as *I see myself as someone who is curious about many different things.* These were grouped into a single Openness laten variable using the sum of four variables that were grouped around the common factor as a result of principal component analysis. Reliability analysis
- The other independent variable of interest is POL. It is a dummy variable measuring the school's support for the use of AI at a policy level, where 1=represents the presence of policy and 0=absence of school policy supporting the use of AI.

The differences across the schools were taken into account by controlling for the school (SCHL) variable. Moreover, the above regression equation also contains multiple personality and individual-level characteristics as control variables. These are:

- AGE – age of the respondent,
- GEN – gender of the respondent,

- SUBJ – subject teachers teach,
- STAG – stage of education,
- COM – degree of computer proficiency,
- ATT – general attitude toward artificial intelligence,
- PSYCAP – psychological capital of a teacher (calculated as a sum of for items: hope, optimism, self-efficacy, and resilience), and
- ILC – locus of control, which stands for the perceived degree of control over the things happening in one's life, including success and failure.
- Finally, we also believe that teachers are more likely to adopt AI should their work colleagues use AI for teaching purposes on a regular basis and measure it using the CUSE dummy variable where 1=colleague(s) are using AI for instructional purposes and 0=otherwise.

## Results

### Results of the Regression Analysis

Table 2 displays the correlations between the independent variables. The modest correlation between these variables suggests that the analysis is not subject to a problem of multicollinearity.

Main regression analysis results are presented in Table 3. As anticipated, statistically significant positive estimates are documented for multiple variables of interest. First, in relation to Hypothesis 1 (H1), the perceived usefulness of AI technology is found to be statistically very significant, suggesting that teachers who view AI as a beneficial tool are more likely to incorporate it into their teaching. Perceived ease of use of AI is found to be significant only at *p*-value=0.1 level. Concerning Hypothesis 2 (H2), teacher innovativeness was found to be a significant predictor of AI adoption, confirming the hypothesis that more innovative teachers are inclined to use AI in their educational practices. Contrary to expectations, openness to new experiences did not significantly influence AI adoption, indicating that teachers will use AI regardless of their degree of openness to new experiences. For Hypothesis 3 (H3), the presence of a school AI policy was significantly associated with AI usage, underscoring that the school that have AI policies in place better stimulate the use of AI for educational purposes by teachers. Additionally, the study suggests that adoption of AI among the teachers is also (i) negatively related to their age (younger teachers are more likely to use AI), and (ii) positively related to the use of AI technology by their colleagues.

**Table 2**

*Correlation Matrix*

| No. | Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Use Of AI | 1.000 | | | | | | | |
| 2 | Perceived Usefulness | .262 | 1.000 | | | | | | |
| 3 | Perceived Ease of Use | .158 | .717 | 1.000 | | | | | |
| 4 | School Policy | .194 | .165 | .038 | 1.000 | | | | |
| 5 | Openness | .071 | .188 | .200 | .112 | 1.000 | | | |
| 6 | Innovativeness | .160 | .147 | .219 | .076 | .271 | 1.000 | | |
| 7 | School | -.092 | .084 | .041 | -.073 | .196 | .024 | 1.000 | |
| 8 | Gender | -.009 | .158 | .146 | -.034 | .026 | .047 | -.105 | 1.000 |
| 9 | Age | -.135 | .066 | -.016 | .072 | .152 | .016 | .059 | -.119 |
| 10 | Teaching Area | -.082 | -.224 | -.145 | -.138 | -.102 | -.083 | .051 | -.046 |
| 11 | Stage | .061 | .178 | .201 | .033 | -.101 | .098 | -.197 | .071 |
| 12 | Computer Skills | .061 | .079 | .008 | .124 | .088 | -.162 | -.028 | .012 |
| 13 | AI Use by a Colleague | .270 | .213 | .223 | .151 | -.047 | -.009 | -.160 | .060 |
| 14 | Attitude Toward AI | .080 | .294 | .163 | -.025 | .259 | .318 | .225 | -.040 |
| 15 | Locus Of Control | .095 | .024 | .043 | -.053 | .151 | .139 | .023 | -.032 |
| 16 | Psychological Capital | .081 | .225 | .202 | .050 | .640 | .279 | .428 | -.049 |

*(cont.)*

| No. | Variables | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Use Of AI | | | | | | | | |
| 2 | Perceived Usefulness | | | | | | | | |
| 3 | Perceived Ease of Use | | | | | | | | |
| 4 | School Policy | | | | | | | | |
| 5 | Openness | | | | | | | | |
| 6 | Innovativeness | | | | | | | | |
| 7 | School | | | | | | | | |
| 8 | Gender | | | | | | | | |
| 9 | Age | 1.000 | | | | | | | |
| 10 | Teaching Area | -.066 | 1.000 | | | | | | |
| 11 | Stage | -.040 | -.018 | 1.000 | | | | | |
| 12 | Computer Skills | .001 | .004 | -.097 | 1.000 | | | | |
| 13 | AI Use by a Colleague | .014 | -.193 | .066 | .148 | 1.000 | | | |
| 14 | Attitude Toward AI | .031 | -.086 | .086 | -.102 | -.059 | 1.000 | | |
| 15 | Locus Of Control | -.035 | .013 | .003 | -.042 | .021 | .114 | 1.000 | |
| 16 | Psychological Capital | .177 | -.092 | -.092 | .069 | -.003 | .373 | .270 | 1.000 |

*Note.* The table documents the correlation between variables used in this paper. All variables are as discussed in section 3.2. The sample period is from April to May 2024.

**Table 3**

*Relationship Between the use of AI by Teacher, Individual-level Factors, Technology Acceptance Components, and Institutional Policies*

| Variables | Model (1) | Model (2) | Model (3) |
|---|---|---|---|
| Perceived Usefulness | 0.269*** | 0.313*** | 0.304*** |
| | (3.360) | (3.845) | (3.660) |
| Perceived Ease of Use | -0.065 | -0.091 | -0.136* |
| | (-0.812) | (-1.141) | (-1.705) |
| School Policy | 0.144** | 0.130** | 0.111** |
| | (2.57) | (2.305) | (1.993) |
| Openness | -0.017 | 0.026 | 0.018 |
| | (-0.302) | (0.442) | (0.254) |
| Innovativeness | 0.129** | 0.133** | 0.130** |
| | (2.232) | (2.291) | (2.191) |
| School | | -0.113** | -0.095 |
| | | (-1.982) | (-1.538) |
| Gender | | -0.80 | -0.079 |
| | | (-1.444) | (-1.443) |
| Age | | -0.176*** | -0.181*** |
| | | (-3.189) | (-3.323) |
| Teaching Area | | -0.004 | 0.027 |
| | | (-0.066) | (0.491) |
| Stage | | -0.011 | -0.008 |
| | | (-0.187) | (-0.142) |
| Computer Skills | | 0.037 | 0.007 |
| | | (0.660) | (0.123) |
| Ai Use by a Colleague | | | 0.216*** |
| | | | (3.780) |
| Attitude Toward AI | | | -0.014 |
| | | | (-0.227) |
| Locus Of Control | | | 0.057 |
| | | | (1.021) |
| Psychological Capital | | | 0.047 |
| | | | (0.585) |
| (Constant) | -0.371 | -0.216 | -0.556 |
| | (-0.878) | (-0.454) | (-1.124) |
| Observations | 306 | 306 | 306 |
| F-Value | 7.214 | 4.812 | 4.825 |
| R-Square | 0.107 | 0.153 | 0.200 |

*Note.* This table documents the relationship between the use of AI by teacher, individual-level factors, technology acceptance components, and institutional policies. The t-values based on the heteroscedasticity-robust standard errors are presented in parentheses. The outcome variable is USE (the use of AI technology for teaching purposes). The sample period is April to May 2024. OLS regression model is used. The symbols ∗, ∗∗, ∗∗∗ correspond to $p < 0.1$, $p < 0.05$, $p < 0.01$, respectively. All variables are as defined in the 'Measurement and Analysis' section.

## Additional Test

To examine the robustness of our results, the model was re-estimated by using an alternative proxy for the USE variable. The regression analysis was run to measure the impact of examined predictors on the Intention to use AI tech – INT as indicated in equation 2.

$$\begin{aligned} \mathrm{INT} = \alpha &+ \beta_1(\mathrm{PU}) + \beta_2(\mathrm{PEU}) + \beta_3(\mathrm{POL}) + \beta_4(\mathrm{OP}) + \beta_5(\mathrm{INN}) + \beta_6(\mathrm{SCHL}) \\ &+ \beta_7(\mathrm{AGE}) + \beta_8(\mathrm{GEN}) + \beta_9(\mathrm{SUBJ}) + \beta_{10}(\mathrm{STAG}) + \beta_{11}(\mathrm{CUSE}) \\ &+ \beta_{12}(\mathrm{COM}) + \beta_{13}(\mathrm{ATT}) + \beta_{14}(\mathrm{ILC}) + \beta_{15}(\mathrm{PSYCAP}) + \varepsilon \end{aligned} \quad (2)$$

Results of the alternative regression analysis were consistent with the previous findings with regards to the impact of the perceived usefulness. All three models suggested statistically very significant impact of perceived usefulness of AI on teachers' intention to use it for educational purposes. Similar to the previous model, the impact of colleagues' practices on the intention to use AI remains statistically significant whereas the individua-level variables, and institutional factors did not sustain their predictive value (Table 4).

The summary of this analysis is summarized in Table 5. As can be seen, all hypotheses except for H2b are supported according to the results of Test 1 and only H1a found support based on the results of Test 2.

**Table 4**

*Relationship Between the Intention to Use AI by Teacher, Individual-Level Factors, Technology Acceptance Components, and Institutional Policies*

| Variables | Model (1) | Model (2) | Model (3) |
|---|---|---|---|
| Perceived Usefulness | 0.310*** | .330*** | 0.351*** |
| | (3.868) | (3.982) | (4.098) |
| Perceived Ease of Use | -0.072 | -0.062 | -0.110 |
| | (-0.900) | (-0.760) | (-1.331) |
| School Policy | 0.089 | 0.090 | 0.069 |
| | (1.579) | (1.582) | (1.209) |
| Openness | 0.067 | 0.051 | 0.040 |
| | (1.155) | 0.845 | (0.545) |
| Innovativeness | 0.042 | 0.061 | 0.075 |
| | (0.723) | (1.034) | (1.230) |
| School | | 0.038 | 0.050 |
| | | (0.654) | (0.777) |
| Gender | | -0.072 | -0.077 |
| | | (-1.276) | (-1.366) |
| Age | | -0.059 | -0.070 |
| | | (-1.058) | (-1.242) |
| Teaching Area | | 0.032 | 0.053 |
| | | (0.561) | (0.934) |
| Stage | | -0.067 | -0.059 |
| | | (-1.157) | (-1.020) |
| Computer Skills | | 0.048 | 0.019 |
| | | (0.850) | (0.331) |

| | | | |
|---|---|---|---|
| AI Use by a Colleague | | | 0.148** |
| | | | (2.523) |
| Attitude Toward AI | | | -0.087 |
| | | | (-1.357) |
| Locus Of Control | | | 0.018 |
| | | | (0.316) |
| Psychological Capital | | | 0.074 |
| | | | (0.883) |
| (Constant) | -0.353 | -0.297 | -0.438 |
| | (-0.979) | (-0.719) | (-1.009) |
| Observations | 306 | 306 | 306 |
| F-Value | 6.939 | 3.721 | 3.428 |
| R-Square | 0.104 | 0.122 | 0.151 |

*Note.* This table documents the relationship between the intention to use AI by teacher, individual-level factors, technology acceptance components, and institutional policies. The t-values based on the heteroscedasticity-robust standard errors are presented in parentheses. The outcome variable is USE (the use of AI technology for teaching purposes). The sample period is April to May 2024. OLS regression model is used. The symbols ∗, ∗∗, ∗∗∗ correspond to $p < 0.1$, $p < 0.05$, $p < 0.01$, respectively. All variables are as defined in the 'Measurement and Analysis' section**.**

**Table 5**

*Summary of the Analysis Results*

| # | | Hypothesis | Test 1 Results | Test 2 Results |
|---|---|---|---|---|
| 1 | a. | Perceived usefulness of AI stimulates the use of AI for educational purposes | Supported*** | Supported*** |
| | b. | Perceived ease of use of AI stimulates the use of AI for educational purposes | Supported* | Not supported |
| 2 | a. | Teacher's innovativeness is positively associated with the adoption of AI for teaching purposes. | Supported** | Not supported |
| | b. | Teacher's openness to new experience is positively associated with the adoption of AI for teaching purposes. | Not supported | Not supported |
| 3 | | Presence of school policy supporting the use of AI increases the use of AI for teaching purposes. | Supported** | Not supported |

*Note.* The symbols ∗, ∗∗, ∗∗∗ correspond to $p < 0.1$, $p < 0.05$, $p < 0.01$, respectively. All variables are as defined in the 'Measurement and Analysis' section.

## Discussion

This research centers on examining the impact of individual, technological, and institutional factors on the use of AI for instructional purposes. Through an examination of these factors and their impact on the adoption of AI by instructors in private schools in Azerbaijan, the study finds important components that either help or impede the real-world implementation of AI technology in education.

The results of the current research posit perceived usefulness and supportive institutional policies as key factors influencing the incorporation of AI technologies into learning environments. According to recent studies, the perceived usefulness of AI plays a major role in adopting these tools in academic settings. This implies that the more the teachers understand the benefits of AI regarding improving teaching efficiency and students' performance, the more likely they are to incorporate the technologies in their teaching practice (Kelly et al., 2023). School policies are also a significant factor in the implementation of AI in classrooms. Schools need to develop clear policies and framework support for AI integration so that teachers feel more secure about using novice technologies and avoid rejection of AI tools (Chan, 2023; Fullan et al., 2023). These findings shed light on the importance of teachers, heads of schools, and other educational managers to support innovative approaches, which include leveraging AI teaching methods.

Another important factor that impacts the use of AI is peer influence: teachers are more likely to use AI if they observe other teachers using it. This peer effect highlights the need for developing a community of practice where innovative teachers and their colleagues can learn from each other and inspire others to test the advantages of AI (Sánchez-Prieto et al., 2019; Stein et al., 2024). Thus, school leaders should ensure that they support and encourage the early adopters of AI to prompt further development of the technology in their schools. These findings have theoretical and practical implications for the use of AI in an educational landscape, suggesting that understanding the integration of these technologies requires consideration of pertinent school polices, teachers' perceptions, and educational contexts.

The significance of this study lies in its contribution to a deeper understanding of the way the institutional support, technology capabilities, and teacher traits interact to enable the adoption of AI in educational ecosystems. Through the identification of the critical roles of perceived utility, policy support, and peer influence, the study offers practical insights that might assist educational institutions in formulating policies for more successful integration of AI into the curriculum.

## Theoretical Implications

In line with previous research, the present study has posited the factor of perceived usefulness as a major predictor for adopting AI technologies among educators (Davis & Granić, 2024; Kelly et al., 2023). The research synthesizes TAM and the Big 5 model, which enables tracing a deeper picture of the factors that may facilitate or hinder the acceptance of technologies (Sánchez-Prieto et al., 2019; Stein et al., 2024). Personality characteristics may play a crucial role in influencing teachers' receptiveness to AI and their willingness to adopt it in their classrooms, thus calling for the development of targeted professional learning interventions that take into account the diverse personality profiles.

The research also establishes that institutional policies are crucial in the integration of AI in learning institutions, making it a critical area that requires policy support and effective policy formulation in learning institutions (Chan, 2023; Fullan et al., 2023). In other words, the more

a school advocates for and encourages the utilization of AI, the higher the levels of AI usage among the staff will be. This requires deliberate planning and measures where educational leaders consider not only the technology resources but also the culture of risk-taking.

## Practical Implications

There are several practical implications of this study for educators, school administrators, and policymakers involved in the implementation of AI in education. These implications present recommendations to be applied towards improving the utilization of AI tools in educational environments.

The results of this study highlight the need for designing and delivering administrative support and professional development opportunities that consider the personality traits of teachers. Since such characteristics as openness to experience and innovativeness strongly relate to AI use (Sánchez-Prieto et al. 2019; Stein et al. 2024), professional development programs should account for existing diversity in teachers' technological literacy and openness for change. For example, the teachers with lower levels of openness might need the AI technologies to be introduced to them in step-by-step manner through the professional development sessions and through the hands-on training that addresses their concerns (Ding et al., 2024). For those educators who are ready for innovations, advanced workshops focusing on innovative uses of AI in pedagogy could be more appropriate.

In this context, school policies have paramount importance in promoting the use of AI. Schools are recommended not only to establish strong supportive policies that go beyond providing the appropriate resources, including access to AI tools and technical support, but also to foster a culture of innovation (Chan, 2023; Fullan et al., 2023). Policies should also consider the physical and social aspects of deploying AI in schools. This involves creating an environment that encourages experimentation and diminishes the fear of failure among teachers. Effective communication of the benefits of AI can further enhance teacher buy-in and support for these initiatives. To mitigate the bias inherent in AI systems, schools should develop policies on data protection, consent, and data usage.

## Limitations of the Study

This study also has the following limitations, which might have an impact on the generalizability of the findings. Initially, the study is based on self-reported data; it should be acknowledged that this type of data is subjected to interpretation errors. Although several techniques were used to minimize these biases, it cannot be claimed that they have not been completely eradicated. Second, the sample of educators participating in the study was limited to teachers from private schools in Azerbaijan, which may hinder the generalization of the findings to the population of teachers in other countries and various educational environments. There are also other contextual factors related to AI that likely affect the extent to which teachers use AI, including the internet connection or the school's technological infrastructure as well as IT assistance. Expanding the range of methodological approaches, involving more

participants, and considering the circumstances in which teachers integrate AI technologies into their practice will contribute to a better understanding of the field.

## Conclusion and Recommendations

This research has established that perceived usefulness and supportive institutional policies are crucial in contributing to the adoption of AI technologies in education. The study emphasizes how crucial it is that educators comprehend and acknowledge the real-world advantages of AI, such as increased pedagogical effectiveness and customized learning opportunities for students (Kelly et al., 2023). These insights facilitate the easier incorporation of AI tools into educational settings. Educational institutions are encouraged to foster an environment that not only supports but actively promotes the integration of AI through clear policies and frameworks. This support is essential for educators to feel secure and competent in utilizing AI technologies, thus reducing the resistance associated with adopting new technologies in the classroom (Obae et al., 2024).

Notably, institutional support is one of the significant factors that emerged in the analysis of the findings. To support AI adoption, educational institutions need to enhance policies that create a favorable environment that stipulates AI's usage and provide extensive training for such purposes (Chan, 2023; Fullan et al., 2023). These policies should also guarantee the provision of the underlying technologies, as well as support the culture of innovative use of AI in the class and remove the culture of fear of trying new ideas from educators by embracing the failure attempts as a positive step towards achieving the necessary integration of AI in the learning process. The research findings advocate for educational reforms that will assist the integration of AI literacy into existing curricula, suggesting that such integration should be informed by an evidence-based approach to enhance the content and effectiveness of AI education. It is crucial that these educational strategies encompass both the technological and pedagogical aspects of AI to ensure that teachers are not only users but proficient implementers of AI tools (Le Borgne et al., 2024).

In addition, the results of this study indicated that there is a need for continuing professional development in conjunction with the identified strategies. This would assist educators in appropriately adapting to further advancements in AI technology for use in teaching. Such training should be more nuanced to reflect the differences in readiness and perceptions towards technology among teachers, in order to meet a range of needs starting from a fundamental introduction to AI technology up to the methodological applications of this concept (Ding et al., 2024).

Looking ahead, there are some ideas that are worth exploring in more detail in the future. More in-depth quantitative research may help to describe long-term changes in teachers' technological beliefs as well as examine the various conditions that may have an impact on the use of AI among teachers. This approach can encompass one-on-one interviews or focus group discussions to obtain detailed information in regards to the psychosocial effects of AI in learning environments.

Furthermore, a longitudinal study could explore how the incorporation of AI into teaching and learning would impact teaching practices and learners' performance in the long-run, which would be instrumental in tackling the question of the sustainability of technology integration in learning and development as well as its benefits and drawbacks over time. A further investigation of AI adoption in different education settings, like public schools or institutions from different geographical regions, will also add to the knowledge of the factors that affect the implementation of AI in an educational arena.

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