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Belief, History and Machines: How Religious Traditions Shape Students' Attitudes Toward Artificial Intelligence

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In recent years, Artificial Intelligence (AI) has rapidly entered the social sphere, including higher education. However, not all cultures perceive it in the same way. This comparative empirical study analyzes how students from two religiously homogeneous countries: Uzbekistan (predominantly Muslim) and Poland (predominantly Catholic) perceive AI in general and as a learning tool. Unlike most studies that focus on technical access or digital literacy, this paper examines the perception of AI from the perspective of historically shaped religious and cultural traditions after the collapse of the Soviet system. The study put forward and tested a research meta-hypothesis: historically shaped cultural and religious traditions should have a statistically significant effect on the perception of Artificial Intelligence by students from Muslim and Catholic countries. We used a standardized Likert-scale survey. The sample consisted of 439 undergraduate students (not majoring in IT). Professional and gender biases were excluded to focus on cultural and religious variables. The z-test at the 90% confidence level was used to test the four key hypotheses. The results showed that students from Uzbekistan have a significantly more positive attitude towards AI than students from Poland. This difference in perception applies to AI both in general and in the educational context. This difference reflects stable ideas about knowledge, traditions and technological progress. The obtained results have theoretical implications and practical significance.

***Keywords*:** Muslim students, Catholic students, religious identity, artificial intelligence, perception, higher education, post-Soviet history

The Soviet Union ceased to exist as a sovereign state on December 25, 1991. After 1991, the former Soviet republics developed independently without official ideological pressure. The present study aims to compare the perception of AI by students from two such countries (Uzbekistan and Poland) with an emphasis on the influence of religious traditions and historical context.

In recent years, artificial intelligence (AI) has been rapidly introduced into various areas of social life (Gabriel, 2019; Carley, 1996; Cox & Mazumdar, 2022; Lee, Kim, & Na, 2018; Nilsson, 1985; Bullock, 2019), including education (Dinh, 2025; Marshik, McCracken, Kopp, & O'Marrah, 2024; Okulich-Kazarin, Artyukhov, Skowron, Artyukhova, & Wołowiec, 2024; Malik, Ed.daran, & Elhajraoui, 2023; Barker, 1994; Rashid, 2020; Adams, Henderson, Yi, & Babyn, 2020; Tang et al., 2018). However, the perception of AI is not universal throughout the world: it is shaped by historical, cultural and religious factors that determine society's attitude to technology and knowledge. Religion can play an important role in the perception of AI, shaping basic ideas about the admissibility of replacing the human mind with machine logic; about trust in digital

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systems; about moral limitations of using such technologies.

The emergence of AI can be traced back to the 1950s (Caspari-Sadeghi, 2022), with pioneers such as Turing (1950), McCarthy (1959), Newell and Simon (Gugerty, 2006), and Feigenbaum (1965). Currently, there are many definitions of Artificial Intelligence (Cox & Mazumdar, 2022; Pantano & Scarpi, 2022). In our study, the definition used is: 'Artificial intelligence (AI) is the ability of computer systems to perform tasks that would normally require human-level intelligence' (Guan, 2019).

Most of the research focuses on digital literacy, access to technology, or ethical issues of AI implementation (Dinh, 2025; Hajam & Gahir, 2024; Marshik, McCracken, Kopp, & O'Marrah, 2024; Okulich-Kazarin, Artyukhov, Skowron, Artyukhova, Dluhopolskyi, & Cwynar, 2024; Malik, Ed.daran, & Elhajraoui, 2023; Ahmad, Abdallah S., Abbasi, & Abdallah A., 2023; Abdelwahab, Rauf, & Chen, 2022). However, there is a lack of comparative empirical studies in the scientific literature on how religiously different societies perceive AI and its educational applications.

This study fills this gap by relying on a cultural-historical approach, according to which the perception of innovations (including AI) depends on historically rooted traditions, values, and cultural scripts that have developed in a particular society. In this context, religion can act as a significant structuring force, shaping attitudes towards technology through the prism of ethics, morality, and social trust.

The aim of this study is to identify differences in the perception of AI by students from two religiously homogeneous but culturally different countries: Uzbekistan (a country with dominant Islam) and Poland (a country with dominant Catholicism). We assume that the influence of historically established religious and cultural norms may lead to differences in the perception of AI. The research is based on a cultural and historical approach, according to which attitudes towards technological innovations are shaped by social traditions, religious values, and historically fixed ideas about knowledge and progress. In Poland (Preamble) and Uzbekistan (Article 49), the Constitutions speak about religion. In Uzbekistan, this is the "duty of citizens to protect... spiritual ... the heritage of the people of Uzbekistan". In Poland, this is also a duty: "we owe it to our ancestors... for our culture, which has its roots in the Christian heritage of the nation...".

The study was conducted at universities in Uzbekistan and Poland in 2023-2025. The sample included undergraduate students not studying in information technology-related specialties. This allowed us to exclude professional bias and focus on religious differences. Standardized questionnaires (Likert scale) and z-statistics methods were used to test the hypotheses.

Research meta-hypothesis: Historically formed cultural and religious traditions should have a statistically significant effect on the perception of Artificial Intelligence by students from Muslim and Catholic countries, determining the degree of its acceptance as a socially acceptable and educational tool.

Thus, the article combines a theoretical analysis of the historical and cultural foundations of AI perception and an empirical study of the differences in the attitudes of students in the two countries.

Literature review

1992-2024: How Has Scientific Discourse About AI Changed?

The introduction of Artificial Intelligence into the social sphere, technology and economy changes the scientific discourse (Hammack, 2008). Scientific discourse, as a part of scientific culture, influences the general culture of youth. An analysis of the number of scientific publications by the keyword "Artificial Intelligence" in the Scopus database showed their growth from 2220 in 1992 to 104171 in 2024 (Figure 1).

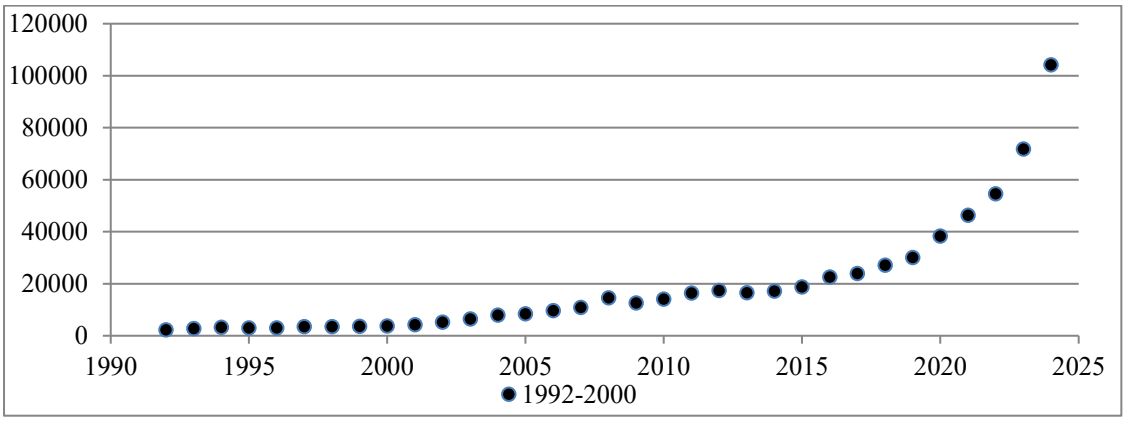

Figure 1. Scientometric analysis by relevance for the keyword 'Artificial Intelligence' in Scopus, based on 626,864 publications published between 1992 and 2024

Figure 1 covers the historical period, which is characterized by a sharp decrease in the ideological burden on the youth of the former Soviet republics and countries. At the beginning of the period, the scientific discourse on Artificial Intelligence had little effect on young people. We had no reason to study students' attitudes towards Artificial Intelligence. The end of this period is characterized by a strong scientific discourse on Artificial Intelligence. In particular, on November 30, 2022, OpenAI launched the ChatGPT (Generative Pre-trained Transformer) chatbot, which quickly attracted the attention of people, including students (Geerling, Mateer, Wooten, & Damodaran, 2023). It is of scientific and practical interest to see the result of a 30-year development of two countries with a different religion.

Theoretical framework

The theoretical basis of the study is the Cultural-Historical Approach (Geertz, 1973; Hall, 1976; Hammack, 2008; González Rey, 2015). The essence of the approach is in the study of phenomena in the context of historical development. This approach states that in education, the cognitive and behavioral reactions of the individual are formed in interaction with the socio-historical and cultural context. Technological innovations, including artificial intelligence, should be perceived through the prism of the socio-historical and cultural context (Geertz, 1973; Tool, 1977; Inglehart, & Welzel, 2005; Blanco & Rosa, 1997; Mayisela, 2024).

Thus, according to Geertz (1973), culture is a system of symbols that give meaning to social reality. Within this system, religion performs the function of interpreting the world and establishing the boundaries of what is acceptable. Religious traditions, rooted in the history of a particular society, shape not only moral attitudes, but also attitudes toward knowledge, technology, and social transformation (Geertz, 1973; Tool, 1977; Inglehart & Welzel, 2005).

In religiously homogeneous societies such as Uzbekistan and Poland, the perception of new technologies, including AI, may be mediated not so much by the level of technical literacy as by ideas about the role of humans, morality, and the acceptable limits of automation. For example, Islam, in the context of modernization and an emphasis on access to education, may contribute to a positive perception of AI as a development tool in Uzbekistan (5G in Tashkent, 2021; U.S. Department of State, 2010; Law of the Republic of Uzbekistan, 2018; Zulkarnain et al., 2025). The Catholic tradition, in contrast, tends to be cautious about technological determinism and places importance on the humanistic foundations of education (Hicks, 2012; Prończuk, 2019; Kopińska, 2020; Klatt, 2023; Rada Ministrów, 2020). The social doctrine of Catholicism is the most developed in comparison with other Christian denominations and movements. It contains the well-known maxim "in necessity - unity, in doubt - freedom, in everything - love" (Jordan, 2012). The priorities of education related to societal improvements in the name of a "social cohesion" vision do not represent a global understanding of the initiatives that education usually includes (Green & Janmaat, 2016). "Polonism" is evident in policy discourses in documents since 2016, where a special emphasis is placed on "attitude formation" and "education" (Klatt,

2023). Therefore, AI may raise doubts about both the general ethics and the admissibility of its use in higher education. This attitude is reinforced by a cultural legacy of a critical attitude towards technocratic development models, inherited, among other things, from the experience of the post-socialist transition (Klatt, 2023; "FTSE Russell Upgrades Poland," 2017). Du, Guerra, Chen, Lindsay, & Nørgaard (2023) point to the need for "trust building". Poland, as an Eastern European country, has problems with recognizing students as subjects of the educational process (Okulich-Kazarin, 2020). The European Union has set ethical and legal limits on the implementation of AI (Al-Amoudi, 2023; Klatt, 2023; Mazur & Włoch, 2023). It may also influence students' perceptions of AI.

Thus, students' perception of AI can be seen as a consequence of cultural scripts anchored in a specific religious and historical environment. In addition, Hall (1976) noted that technologies act as an extension of human capabilities, but do not replace them. This allows us to consider AI as a tool whose effectiveness and appropriateness depend on the context of its application.

To ensure conceptual consistency and empirical measurability, the study identifies two key constructs reflecting students' attitudes towards artificial intelligence (AI) in general and its use in the educational process. Both constructs are based on the classical models of the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT), as well as on later adaptations focused on the perception of artificial intelligence in education.

The first construct, "General attitude towards artificial intelligence", is defined as an individual's emotional and cognitive orientation towards artificial intelligence as a social phenomenon, including a willingness to accept its existence and trust its application in society. This construct reflects the fundamental level of technology perception and is based on the attitude towards use dimension highlighted in the TAM model.

The second construct, "Attitude towards the use of AI in education", is understood as the perceived usefulness, relevance and permissibility of using artificial intelligence in educational activities, which correlates with the measurement of perceived usefulness and behavioral intention in the UTAUT model. This construct reflects the applied dimension - the level of AI adoption within a specific institutional context (university).

The perception of artificial intelligence (AI) is considered not from the standpoint of technical parameters, but as a socio-cultural phenomenon that is formed in the context of historical and religious traditions. The basic idea is that a person's attitude to technology reflects deep cultural attitudes that determine the permissibility, trust, and moral acceptability of new forms of knowledge.

From this point of view, differences between countries with different religious traditions (Islamic and Catholic) can be seen as the result of historically established scenarios of trust in sources of knowledge and the power of technology. In religiously homogeneous societies, such scenarios are fixed not only in the doctrine of faith, but also in educational practices, forming stable ideas about what is considered acceptable in the learning process.

Thus, both constructs, "general attitude to AI" and "attitude to AI in education", are interpreted as socio-psychological reflections of cultural norms, rather than as technical indicators of readiness to use technology. This simplified but conceptually holistic definition allows us to preserve the cultural and historical framework of the study and avoid over-complicating the model.

The proposed approach allows us to interpret differences in the perception of AI not as individual fluctuations, but as a manifestation of historically established cultural attitudes associated with religious tradition (Lalueza & Macías-Gómez-Estern, 2020). It sets a framework for analysis in which respondents' behavior is not considered in isolation, but as a reflection of broader collective meanings (Grimalt-Álvaro & Ametller, 2021; Portes & Salas, 2007; del Río & del Río, 2007; Hammack, 2008).

Method

Research design

This study is based on a quantitative comparative analysis and relies on a standardized Likert scale questionnaire. This design provides a quantitative assessment of students' attitudes toward artificial intelligence (AI) in two religiously homogeneous countries with different historical and cultural backgrounds: Uzbekistan and Poland. The method was chosen taking into account the identified gap in the literature: the lack of empirical cross-cultural data on the influence of religion on the perception of AI in the educational sphere.

The research meta-hypothesis was divided into 4 hypotheses.

The hypothesis 1 is: There is a statistically significant difference in the overall perception of AI between students from Uzbekistan and Poland, due to differences in cultural and religious traditions.

The hypothesis 2 is: Students from Uzbekistan assess the use of AI for educational purposes more positively than students from Poland, reflecting differences in religious and cultural attitudes towards innovation.

The hypothesis 3 is: There is no statistically significant difference between the perception of AI in general and as a tool in higher education among students from Uzbekistan.

The hypothesis 4 is: There is no statistically significant difference between the perception of AI in general and as a tool in higher education among students from Poland.

Population and sample

The study involved 439 undergraduate students studying at universities in Uzbekistan and Poland (Table 1). Uzbekistan was chosen because Uzbekistan is a practically monoreligious country. In 2020, 94.78% of the population professed Islam (https://www.thearda.com/world-religion/national-profiles?u=236c). Poland was chosen for the same reason. In 2020, 96.61% were Christians, of which 90.10% were Catholics (https://www.thearda.com/world-religion/national-profiles?u=180c). That is, historically, religion in each country has a dominant influence on the cultural context.

Table 1

General characteristics of the respondents, 2023

No	Indicator	Female	Male	Sum	Students
1	Uzbekistan	39	36	75	Bachelor, non-information sciences, 1-2 year
2	Poland	283	81	364	Bachelor, non-information sciences, 1-3 year
	Total	322	117	439	-

Source: own data

Table 1 shows that the total number of respondents is 439. All respondents did not study AI as part of a mandatory educational program and did not specialize in the field of information technology, which minimized professional distortions of perception. Gender and academic specialization were taken into account to eliminate structural biases. Gender composition: 322 women, 117 men. The sample was purposeful, focusing on the religious homogeneity of countries and the representativeness of the student community. The survey was anonymous and voluntary.

Instrument

The main tool used was a structured questionnaire, including:

- Metrics (country, gender, year of study),
- Two questions:

1) How do you feel about Artificial Intelligence,
2) How do you feel about using Artificial Intelligence in the teaching process.

The assessment was carried out on a Likert scale with five levels of gradation:

- definitely yes = 4;
- rather yes = 3;
- hard to say = 2;
- rather not = 1;
- definitely no = 0.

This scale allowed us to record the general emotional and cognitive attitude towards AI. Although the questions are conceptual, the Likert scale is appropriate here, since it allows us to reflect the degree of agreement with the positive perception of AI as a phenomenon and tool.

The questionnaire was developed by the authors based on similar studies published in the FWU Journal of Social Sciences and other peer-reviewed journals (e.g., Ahmad et al., 2023; Abdelwahab et al., 2022; Okulich-Kazarin, Artyukhov, Skowron, Artyukhova, & Wołowiec, 2024). The questionnaire was pre-tested with experts in the fields of psychology and education in Poland and Uzbekistan (Okulich-Kazarin, Artyukhov, Skowron, Artyukhova, Dluhopolskyi, & Cwynar, 2024). The reliability of the questionnaire was assessed qualitatively: through an analysis of the wording, their interpretation, and comprehensibility for respondents (Okulich-Kazarin, Artyukhov, Skowron, Artyukhova, & Wołowiec, 2024). Although a formal test of internal consistency (e.g., using Cronbach's α) was not conducted, expert validation confirmed the content relevance and logical consistency of the scale. We acknowledge this as a limitation that could be addressed in further research.

The study deliberately used a minimalistic measurement tool consisting of two key questions aimed at identifying students' general attitudes towards artificial intelligence (AI) and attitudes towards its use in the educational process. This approach is due to the pilot nature of the study, the main purpose of which was to identify cultural and religious differences in the perception of AI, rather than building a complete model of technology adoption.

When formulating the questions, their correspondence to the key dimensions of the "general attitude to AI" and "attitude to AI in education" (perceived usefulness) models was taken into account. This made it possible to assess the emotional and cognitive attitude to technology at a basic level.

Thus, the tool used should be considered as a pilot diagnostic tool for preliminary cultural validation before the possible use of extended scales in future studies. In the future, it is planned to adapt and localize multifactorial questionnaires that include cognitive, behavioral and emotional components of attitudes towards AI, which will increase the depth of analysis and cross-cultural comparability of data.

Data collection procedure

Data collection and processing took place between November 2023 and March 2025 at one university in Poland and two universities in Uzbekistan. The survey was conducted online using the cloud of National Louis University (Poland). Before the survey, all participants were warned about the voluntary and anonymous nature of the answers. Students who did not agree to give answers did not take part in the survey.

Statistical analysis techniques

The z-statistic for independent samples was used to test the four key hypotheses:

- confidence level: 90%,
- two-tailed test,
- sampling error: 4%.

Under these conditions, a minimum sample size is 423 respondents. Thus, the number of respondents in the study meets the requirements of statistical standards (Kingston University, 2010; Scanmarket, n.d.).

Statistical processing included calculation of mean values (M), standard deviations (δ), and testing of statistical significance of differences between groups. The choice of z-analysis was due to the sample size and

normal distribution of estimates, which was confirmed by preliminary testing.

To verify statistical hypotheses, the respondents' answers were assigned the following values:

- definitely yes = 4;
- rather yes = 3;
- hard to say = 2;
- rather not = 1;
- definitely no = 0.

The answers "Rather yes" and "Definitely yes" were assigned values 3 and 4. The neutral value in the survey was the answer "Hard to say". This answer characterizes undecided students. This answer was assigned a value of 2. The answers "Rather not" and "Definitely no" were assigned values 1 and 0.

Each key hypothesis was transformed into a pair of statistical hypotheses, a null and an alternative (z-statistics).

Null hypothesis H_{01}: There are no differences in the perception of AI between students from Uzbekistan and Poland ($\mu_1-\mu_2 = 0$).

Alternative hypothesis H_{11}: Differences in perception of AI between students from Uzbekistan and Poland are statistically significant ($\mu_1-\mu_2 \neq 0$).

Null hypothesis H_{02}: There are no differences in perception of AI in education between students from Uzbekistan and Poland ($\mu_1-\mu_2 = 0$).

Alternative hypothesis H_{12}: Students from Uzbekistan and Poland have different opinions about AI in education ($\mu_1-\mu_2 \neq 0$).

Null hypothesis H_{03}: Students from Uzbekistan perceive AI in general and in the educational context in the same way ($\mu_1-\mu_2 = 0$).

Alternative hypothesis H_{13}: There is a statistically significant difference between these two aspects of AI perception ($\mu_1-\mu_2 \neq 0$).

Null hypothesis H_{04}: Students from Poland perceive AI in general and in the educational context in the same way ($\mu_1-\mu_2 = 0$).

Alternative hypothesis H_{14}: There is a statistically significant difference between these two aspects of AI perception ($\mu_1-\mu_2 \neq 0$).

In the above statistical hypotheses:
μ_1 - mean of the first population,
μ_2- mean of the second population.

Statistical calculations and verification (z-statistics) were performed according to the standard methods described in (Kingston University, 2010; Okulich-Kazarin, 2024).

Results

Assessing the general attitude of students towards artificial intelligence

To identify differences in the general perception of AI between students from Uzbekistan and Poland, the answers to the question: "What is your general attitude towards artificial intelligence?" were analyzed (Table 2). Two Polish respondents did not answer this question.

Table 2

Distribution of students' answers to the question: How do you feel about Artificial Intelligence?

No	Answer	Uzbekistan	Poland
1	Definitely positively	25	60
2	Rather positively	38	164
3	Hard to say	10	100
4	Rather negatively	2	32
5	Definitely negatively	0	6
6	M(x)	3.1467	2.6630
7	δ_x	0.7428	0.8312
	Total	75	362

Source: own data

Table 2 shows that most of the answers are in the positive area ("Rather yes" and "Definitely yes") for both groups of respondents. The number of undecided respondents ("Hard to say") is higher among Polish students.

The average Likert scale values were M(x) = 3.15 (Uzbekistan) and M(x) = 2.66 (Poland), indicating a more pronounced positive perception among Uzbek students. Standard deviations: 0.74 and 0.83, respectively.

In both samples, positive assessments predominate, but Polish students more often choose the neutral option ("hard to say"), which may indicate greater doubt or cognitive ambiguity regarding AI.

Assessing attitudes towards the use of AI in education

The answers to the second question: "How do you feel about the use of AI in the educational process?" showed a similar trend (Table 3). Two Uzbek respondents did not answer this question.

Table 3

Distribution of students' answers to the question: How do you feel about using Artificial Intelligence in the teaching process?

No	Answer	Uzbekistan	Poland
1	Definitely positively	27	71
2	Rather positively	28	156
3	Hard to say	14	82
4	Rather negatively	2	43
5	Definitely negatively	2	12
6	M(x)	3.0411	2.6346
7	δ_x	0.9571	1.0276
	Total	73	364

Source: own data

Table 3 shows that the number of negative responses ("Rather not" and "Definitely no") increased compared to the responses in Table 2 for both groups of respondents.

The average value in Uzbekistan is M(x) = 3.04, in Poland M(x) = 2.63. Both groups are on average positive about the use of AI in education, but Polish students demonstrate a greater degree of caution or uncertainty. The obtained result is statistically significant (90.0%).

Comparative statistical analysis between countries (Hypotheses 1 and 2)

To test the statistical significance of differences between countries, z-tests of two independent samples were used. The results are shown in Table 4.

Table 4

Testing the hypothesis about the difference in the general perception of AI (Hypothesis 1) and the hypothesis about the difference in the perception of AI in education (Hypothesis 2)

Calculation stage	The hypothesis 1		The hypothesis 2	
	Uzbekistan	Poland	Uzbekistan	Poland
The size of a sample, N	75	362	73	364
The expected value, M(x), %	3.1467	2.6630	3.0411	2.6346
$\mid M(x_1) - M(x_2) \mid$	0.4837		0.4065	
$\mu_1 - \mu_2$	0.00		0.00	
The standard deviation for the sample, $\boldsymbol{\delta_x}$	0.7428	0.8312	0.9571	1.0276
Average error, $\dot{S}_{\bar{X}} = \boldsymbol{\delta_x} / \sqrt{n}$	0.0858	0.0436	0.1128	0.0539
$\dot{S}_{\bar{X}}^2$	0.0074	0.0019	0.0127	0.0029
$\mid z_{stat} \mid$	6.5222		4.1063	
The value z_{tabl} for the standard testing level of 0.10	1.645		1.645	
Result, $\mid z_{stat} \mid > z_{tabl}$	Yes		Yes	

Source: obtained from own data

If in Table 4, z-statistics $\mid z_{stat} \mid$ is larger than the z_{tabl}, so the Null hypothesis is rejected. And the Alternative hypothesis is accepted in both cases, if random deviations are not taken into account. This means that students from Uzbekistan perceive AI more positively than students from Poland, both in general and in the context of higher education. The obtained result is statistically significant (90.0%).

Comparison of attitudes within each country (Hypotheses 3 and 4)

Table 5 presents the process and results of verification of statistical hypotheses for hypotheses 3 and 4.

Table 5

Comparison of the general perception of AI and its application in education within two countries

Calculation stage	The hypothesis 3		The hypothesis 4	
The size of a sample, N	75	72	364	364
The expected value, M(x), %	3.1467	3.0411	2.6630	2.6346
$\mid M(x_1) - M(x_2) \mid$	0.1056		0.0284	
$\mu_1 - \mu_2$	0.00		0.00	
The standard deviation for the sample, δ_x	0.7428	0.9571	0.8312	1.0276
Average error, $\dot{S}_{\bar{X}} = \delta_x / \sqrt{n}$	0.0858	0.1128	0.0436	0.0539
$\dot{S}_{\bar{X}}^2$	0.0074	0.0127	0.0019	0.0029
$\mid z_{stat} \mid$	1.4505		0.8981	
The value z_{tabl} for the standard testing level of 0.10	1.645		1.645	
Result, $\mid z_{stat} \mid > z_{tabl}$	No		No	

Source: obtained from own data

If in Table 5, z-statistics $\mid z_{stat} \mid$ is less than the z_{tabl}, so the Null hypothesis is accepted in both cases, if random deviations are not taken into account. This means that students from both countries have a positive attitude towards the use of AI, both in general and in higher education. For both countries, the differences between general attitudes towards AI and attitudes towards its educational applications are not statistically significant. The obtained result is statistically significant (90.0%).

Discussion

The findings support the research hypothesis that cultural and religious traditions influence the perception of artificial intelligence. Students from Uzbekistan, where the Islamic tradition is combined with a state focus on technological modernization, demonstrate higher rates of acceptance of AI both in general and in the context of education. In contrast, Polish students, who are formed in the context of the Catholic humanist tradition and European critique of technocracy, demonstrate a more reserved and less certain attitude.

Unlike other studies that have focused primarily on access to technology (e.g. Abdelwahab et al., 2022; Hajam & Gahir, 2024), our study shows that the cultural-religious context factor may play an equally important role. This is also supported by the findings of Ahmad et al. (2023), where the perception of AI depends on the cultural environment and the level of trust in digital solutions. However, not all results of other studies fully coincide with our findings. For example, Marshik et al., (2024) show that students in the United States have a positive but fragmented attitude towards AI, not tied to religious or cultural background. This may indicate a more individualized perception in multicultural societies, as opposed to religiously homogeneous countries.

The obtained results help to more accurately take into account cultural and religious differences when implementing AI in educational processes. This is especially important for international projects, academic mobility programs and transnational initiatives in the field of digitalization of education. However, it is impossible to deny the importance of the results for national educational systems.

The results can be used:

• by government bodies - when forming educational policy in the field of digital transformation;

• by developers of educational tools and platforms - when designing interfaces and functionality taking into account the level of trust in AI in countries with different cultures;

• by universities - to adapt digital solutions to the peculiarities of perception of students with different historical backgrounds.

Knowing how historically conditioned values influence the adoption of AI technologies makes it possible to build more accurate and sustainable strategies for their implementation.

The study contributes to the development of a cultural-historical approach by applying it to the analysis of the perception of digital technologies in the educational environment. It shows that attitudes towards AI are formed not only under the influence of the level of digital literacy or professional training, but also as a continuation of cultural, religious and historical contexts. The results expand the scope of the cultural-historical approach, extending it to the sphere of modern technological innovations. The results confirm that technologies are interpreted not in isolation from culture, but as its continuation or challenge.

Thus, differences in students' perceptions of AI cannot be explained solely by personal preferences or levels of digital literacy. They are mediated by historically established scenarios for interpreting technologies, which are based on religious ideological foundations.

The study is limited to a sample of undergraduate students from two countries and does not include master's, postgraduate, advanced training students or teachers. The respondents were not trained in IT specialties, which helps to avoid professional bias. However, the professional composition of the respondents does not reflect the perception of AI among the technical audience. The Likert scale used reveals general perceptions, but does not capture the motivational or value bases of the answers. The study also focuses on two religiously homogeneous countries (Uzbekistan and Poland) and does not include multi-confessional contexts.

Conclusions

The results of the study confirmed the main hypothesis: students' perception of artificial intelligence is formed not only on the basis of individual experience, but also reflects the influence of historically established religious and cultural traditions. Students from Uzbekistan, where Islam is combined with a positive attitude towards technological progress, demonstrate a higher level of acceptance of AI both in general and in the educational sphere. At the same time, students from Poland (a country with a predominantly Catholic tradition) express a reserved or uncertain attitude towards the use of AI in education.

These differences have both theoretical and practical implications. From a theoretical perspective, the study extends the application of the cultural-historical approach to the study of digital technologies. It demonstrates that the perception of AI is not universal, but is conditioned by symbolic systems that are formed in specific religious and socio-cultural contexts.

From a practical perspective, the results may be useful:

• for educational policy: when developing national and transnational strategies for digitalization of education, taking into account cultural sensitivity;

• for developers of digital platforms and educational solutions: when designing interfaces, functionality and levels of autonomy of AI systems depending on trust in them in various cultural environments;

• for universities: when introducing AI into educational processes through pilot projects that take into account local attitudes and values of students.

There are three multi-level managerial recommendations:

• government bodies need to perform a preliminary analysis of the cultural and historical aspect when forming educational policy in the field of digital transformation;

• developers of educational tools and platforms need to adapt the design brief / technical requirements according to the perception of AI by students before starting to design interfaces and functionality;

• universities need to draw up plans for the implementation of AI technologies in pedagogical practice, taking into account the cultural background of students' perception of AI.

Therefore, unified technological solutions require cultural specificity and subsequent adaptation. This is especially important for international academic programs, mobility programs, and distance learning platforms.

Limitations and future research directions

One of the limitations of the study is the difference in the volume of national subsamples (364 Polish and 75 Uzbek students). This imbalance is due to the different availability of respondents, but it does not affect the correctness of statistical analysis: standard methods of comparing samples of different sizes were used to test hypotheses (Kingston University, 2010). With a confidence level of 90% and a total sample size (n = 439), the results remain statistically reliable. Future studies plan to distribute the sample more symmetrically between countries.

The study is also limited to a sample of non-IT-related undergraduates from two religiously homogeneous countries. In the future, it seems important to:

1. expand the geography and religious diversity of the sample by including countries with a multi-religious structure;
2. conduct in-depth interviews to understand the motivations and reasons behind positive or negative attitudes towards AI;
3. conduct a follow-up study in 3–5 years to record possible dynamics of perception against the background of technological and regulatory changes.

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