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Pedagogical university students' ethical attitudes and competences regarding artificial intelligence: An empirical study

Abstract

Research objectives and problems: The aim of the research was to examine the self-assessment and views of students from a pedagogical university on the ethical and moral aspects of using AI and their relationship with general attitudes toward AI, as well as competences and knowledge in this area.

Research methods: The diagnostic survey method was used, including an original questionnaire and the General Attitudes toward Artificial Intelligence Scale (GAAIS). The study sample consisted of 226 participants.

Process of argumentation: The article begins with an introductory section, followed by a presentation of the research methodology and the results obtained. It concludes with a discussion of the main findings.

Research findings and their impact on the development of educational sciences: Analysis of the responses showed that 65.04% of respondents always follow ethical principles when using AI, and 67.70% are mindful of privacy and information security issues. 50.45% believe that using AI for assignments and exams constitutes cheating or plagiarism, while only 45.13% consider it morally wrong. Respondents support regulations for the use of AI (72.12%) and favor preparing students

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for the ethical use of AI in their future work (85.84%). They are largely opposed to banning AI in educational institutions (69.47%). Students expressed more positive attitudes towards the benefits of AI (M = 3.22) than levels of understanding of its disadvantages (M = 2.72). Respondents rated their competences (M = 2.65) and knowledge (M = 2.85) regarding AI as below average.

Correlation analysis revealed that students who had more positive attitudes towards the benefits of AI, a better understanding of its disadvantages, and a higher self-assessment of AI competence were less willing to agree that:

- using AI for assignments and exams constitutes cheating or plagiarism and is morally wrong;

- regulations should be developed to define the extent of AI use in education;

- the use of AI in educational institutions should be banned.

Furthermore, students with more positive attitudes towards the benefits of AI were:

- more likely to support the idea that students should be prepared for the ethical use of AI in their future professional work.

Conclusions and recommendations: The research conducted constitutes an important starting point for a more in-depth analysis of students' knowledge and behavioural patterns in the context of AI use. The findings indicate that students generally exhibit a positive attitude towards the implementation of AI tools in educational settings and recognize their potential in both teaching and learning processes.

However, a concerning trend emerges: individuals who have higher levels of competence in using AI and who display a favorable attitude towards the technology often do not perceive a need for introducing regulations governing its use in educational institutions. Furthermore, they frequently do not view the use of AI in completing assignments or exams as a form of unethical conduct, such as cheating or plagiarism.

In light of these findings, the issue of properly preparing future teachers and specialists for working in environments where AI may become an integral element of children's and adolescents' education becomes particularly important. Accordingly, it is essential to incorporate topics related to the use of artificial intelligence into higher education curricula, with particular attention to ethical and moral considerations.

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Introduction

Over the years, numerous studies have been conducted to understand the mechanisms underlying the acceptance or rejection of technologies, including those based on artificial intelligence (AI) (see, e.g., Chatterjee & Bhattacharjee, 2020; Choi et al., 2023; Hong, 2022). Some of these studies have focused on the technical aspects of AI-based technologies, others on user motivations and human–AI interaction (Lv et al., 2022; McLean & Osei-Frimpong, 2019), and still others on the role of ethics in decision-making processes, particularly in educational contexts (Akgun & Greenhow, 2022).

A wide range of tools has been used in research to assess attitudes towards AI. Each has its strengths and limitations, and each emphasizes particular variables. For instance, the Technology Acceptance Model (TAM) (Davis et al., 1989) examines the cause-and-effect relationships between perceived usefulness, ease of use, user attitudes, behavioral intentions , and actual technology usage. The Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003) identifies four key constructs: performance expectancy, effort expectancy, social influence, and facilitating conditions. The updated UTAUT2 (Venkatesh et al., 2012) expands the model for consumer contexts with hedonistic motivation, price value, and habit. In turn, the AI AIDUA model combines self-efficacy, technology acceptance, and AI ethics into an integrated framework (Shao et al., 2024). The General Attitudes towards Artificial Intelligence Scale (GAAIS) (Schepman & Rodway, 2020, 2023) measures the psychological correlates of attitudes towards AI.

User attitudes towards AI are highly diverse and determined by numerous factors, such as the level of technological knowledge, prior experience, trust in digital systems, and socio-cultural context. A key element that determines the acceptance, implementation, and use of new technologies is the user's attitude towards a given innovation. When users recognize the benefits of using AI, exhibit curiosity, and do not fear loss of control or privacy, they are more likely to change their behavior. Such an attitude promotes openness to experimenting with technology and a stronger

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motivation to explore and regularly use AI in everyday life or work. As Galindo-Domínguez et al. (in press) point out, a positive attitude is the first and essential step in the process of technological adaptation, which can lead to the permanent integration of AI into various areas of user activity.

We are witnessing the rapid evolution of AI and its growing presence in nearly every aspect of our lives. At this stage, the consequences and effects of its use, particularly in science and education, are still unpredictable. Generative artificial intelligence (GEN AI) offers a wide range of capabilities, such as text generation and edition, collecting source materials, analysis of various sources, task-solving, and developing scientific projects. In early 2023, media reports indicated that ChatGPT had passed law exams in four subjects at the University of Minnesota and a business management exam at the University of Pennsylvania's Wharton School of Business (*Sztuczna inteligencja…*, 2023).

The vast majority of university students in Poland believe that AI should be permitted in educational settings (Wieretilo, 2023), while also calling for the introduction of clear regulations regarding its use (Malmström, Stöhr & Ou, 2023; Wieretilo, 2023). In the UK, one in three students used ChatGPT or other AI tools at least once a week in 2023, and one in nine used them daily (The Knowledge Academy, 2023). Over time, studies have documented an upward trend in the use of AI in educational contexts (Nam, 2023; Welding, 2023). Teachers, too, generally view the possibility of using AI in teaching positively, though they often have limited knowledge of how these tools can support their practice (Chounta et al., 2022; Galindo-Domínguez et al., in press; Polak et al., 2022).

With every advantage come disadvantages. In the case of AI, we can point to issues such as the spread of disinformation, copyright infringement, hallucinations, or academic dishonesty – specifically, when users present AI-generated work as their own without acknowledging that it was produced with the help of artificial intelligence. The ease with which AI can analyse documents, write essays, or draft reviews creates a strong temptation to use it and reduce the time required to complete these tasks independently. Improper use of AI may lead to unreliable research, data fabrication, and the spread of false information.

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Holden Thorp (2023), editor-in-chief of *Science*, notes that only 63% of abstracts generated by ChatGPT were identified as such by academic reviewers. AI is also capable of producing articles that can pass the editorial review process (Grimaldi & Ehrler, 2023), although AI-generated content – scientific or otherwise – is more likely to contain factual errors (Fyfe, 2023; Ma et al., 2023; Shin & Park, 2019). Consequently, there is growing concern about the ethical use of artificial intelligence in academic work (Grimaldi & Ehrler, 2023; Pourhoseingholi et al., 2023; Xiao, 2023).

Problems and purpose of research

The aim of the study was to understand education students' self-assessment and views on the ethical and moral aspects of using artificial intelligence (AI), and how these relate to their general attitudes towards AI, as well as their competences and knowledge in this area. The study was exploratory, and thus no research hypotheses were formulated. The following research questions were posed:

1. What is students' self-assessment of the ethical use of AI?
2. What are students' views on the ethical and moral aspects of AI use in various areas?
3. What are students' attitudes towards AI?
4. How do students assess their knowledge and competences related to AI?
5. Are there relationships between students' self-assessment and views on the ethical and moral aspects of AI use, and their positive and negative attitudes towards AI, as well as their self-assessed knowledge and competences in this area?

Research method and sample characteristics

The study used the diagnostic survey method and survey technique. The research tool was an original questionnaire, which included a summary, seven statements regarding the moral and ethical aspects of using AI, two statements on self-assessment of knowledge and competences in this area, and the General Attitudes toward Artificial Intelligence Scale (GAAIS) (Schepman & Rodway, 2020, 2023). The GAAIS assesses general attitudes towards AI and includes two subscales: one measuring positive attitudes toward the benefits of AI, and the other measuring attitudes towards its disadvantages.

Both the English and Turkish versions of the GAAIS have demonstrated good psychometric properties (Schepman & Rodway, 2020, 2023; Kaya et al., 2024). In accordance with applicable ethical research guidelines, the authors' permission was obtained to use and translate the tool into Polish for the purposes of this study. The translation process included both translation and back-translation by English language specialists. The internal consistency of the Polish version of the GAAIS subscales was confirmed by calculating Cronbach's alpha: 0.847 for the positive subscale and 0.805 for the negative subscale.

The research was conducted online in May 2024. All participants gave informed consent to participate. The study population consisted of students from the Maria Grzegorzewska University in Warsaw. A total of 239 responses were received. The responses of 13 participants (5%) were excluded due to failure to complete the attention checks in the GAAIS questionnaire correctly. Ultimately, the study sample consisted of 226 students, representing all academic years and fields of study offered by the university.

The majority of respondents were women (n = 189; 83.63%), while only 8.85% were men (n = 20). Eight non-binary individuals (3.56%) participated in the study. The same number of respondents (n = 8; 3.56%) selected the "I don't want to answer" category, and one person (0.44%) did not respond. The youngest participant was 18 years old, and the oldest was 55. The average age of respondents was 22.66 years (SD = 5.52; Me = 21).

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Data analysis procedure

The data was processed using MS Excel and IBM SPSS Statistics. A statistical description of ordinal variables was performed, including basic indicators – count and frequency – as well as quantitative measures, for which the mean (M), median (Me), standard deviation (SD), minimum (Min), and maximum (Max) were calculated.

To determine correlations, variable categories were assigned ranks using the following scale:

I strongly agree – 5, I somewhat agree – 4, I have a neutral opinion – 3, I somewhat disagree – 2, I strongly disagree – 1.

Spearman's non-parametric rank correlation test was used, with a 5% margin of error assumed (significance level $p < 0.05$).

Results

Ethical and moral aspects of using AI

Students were asked to respond to seven statements regarding various ethical and moral aspects of using artificial intelligence. The detailed distribution of responses is presented in Table 1. The first two statements concerned the respondents' behaviour. A majority of students agreed with Statement 1[1]: a total of 65.04% (n = 147) selected either "I strongly agree" or "I somewhat agree." One in four respondents gave a neutral response, which indicates that they were either unwilling or unable to assess whether they follow ethical principles when using AI. One in ten admitted that they do not follow these principles; "I somewhat disagree" and "I strongly disagree" were selected by a total of 10.62% of respondents (n = 24).

Statement 2, also related to behaviour, was phrased in reverse. Here, 67.70% (n = 153) disagreed with the statement, while 18.14% (n = 41)

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[1]   The full wording of the analyzed statements is provided below in Table 1.

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confirmed its truth. Slightly fewer respondents than in the case of the first statement, 14.16%, were unable or unwilling to assess their behaviour in this regard.

Table 1. Ethical and moral aspects of using AI

Response categories	1		2		3		4		5		6		7	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Strongly disagree	3	1.33	63	27.88	17	7.52	17	7.52	7	3.10	3	1.33	60	26.55
Somewhat disagree	21	9.29	90	39.82	30	13.27	47	20.80	9	3.98	5	2.21	97	42.92
Neutral	55	24.34	32	14.16	65	28.76	60	26.55	47	20.80	24	10.62	42	18.58
Somewhat agree	86	38.05	35	15.49	59	26.11	56	24.78	60	26.55	74	32.74	16	7.08
Strongly agree	61	26.99	6	2.65	55	24.34	46	20.35	103	45.58	120	53.10	11	4.87

Source: Authors' research

Statements:
1. *When using applications or products based on artificial intelligence systems, I always comply with ethical principles;*
2. *I never pay attention to privacy and information security issues when using applications or products based on artificial intelligence systems;*
3. *Using tools based on artificial intelligence systems to complete assignments and exams constitutes cheating or plagiarism;*
4. *Using tools based on artificial intelligence systems to solve tasks and exams is morally wrong;*
5. *It is worth developing regulations that will determine the extent to which students, pupils, and teachers can use artificial intelligence in education (writing programs, diploma theses, articles, scenarios, etc.);*
6. *It is worth preparing students to ethically use tools based on artificial intelligence systems in their future professional work;*
7. *All tools based on artificial intelligence systems should be banned in educational institutions.*

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The next statements concerned the respondents' views on the ethical and moral aspects of using AI in various areas. The first one was about completing tasks and exams. Slightly more than half of the respondents (50.45%; n = 114) believed that such use constitutes cheating or plagiarism, and 20.79% (n = 47) were of the opposite opinion. Almost one-third of the respondents had a neutral opinion. A similar distribution of answers was observed for statement 4.

45.13% (n = 102) of respondents agreed with this statement, while 28.32% (n = 64) disagreed. One in four respondents had no opinion on this subject. The respondents (72.12%; n = 163) supported the development of regulations that would determine the extent to which students, pupils, and teachers can use artificial intelligence in education. Only 7.08% (n = 16) did not see such a need, and one in five did not take a position, selecting the category "I have a neutral opinion." The respondents also supported preparing students to ethically use AI-based tools in their future careers (85.84%; n = 194). Only eight people (3.54%) disagreed, and one in ten respondents did not express an opinion.

It is worth emphasizing that although the surveyed students appear to support the use of AI in educational institutions (69.47%; n = 157), 11.95% (n = 27) agreed with statement 7, and one in five respondents had a neutral opinion.

Attitudes towards AI,[2] self-assessment of knowledge and competences in the field of AI

Table 2 presents the indicators determined for the GAAIS subscales. A higher mean score was found for the positive scale (M = 3.22) than for the negative scale (M = 2.72). Students have more positive attitudes towards the benefits of AI than understanding attitudes towards its disadvantages. Respondents demonstrated above-neutral attitudes towards

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[2] For more information, see the authors' article "Students' attitudes towards artificial intelligence and their digital competence."

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AI on the positive subscale and slightly below-neutral attitudes on the negative subscale. It is worth emphasizing that the variation in results on the negative subscale was greater than on the positive one.

Table 2. Descriptive statistics for the GAAIS subscales

Variables	*M*	*SD*	*Me*	*Min*	*Max*
Positive GAAIS	3.22	0.653	3.25	1.17	4.50
Negative GAAIS	2.72	0.751	2.63	1.13	4.63

Source: Authors' research

The respondents rated their knowledge of AI and their competences related to its use on a five-point scale, where 1 represented a very low rating and 5 a very high rating. The calculated indicators are presented in Table 3.

Table 3. Self-assessment of knowledge and competences regarding AI

Variables	*M*	*SD*	*Me*	*Min*	*Max*
Level of knowledge about AI	2.85	0.877	3	1	3
Competencies in the use of AI	2.65	0.987	3	1	5

Source: Authors' research

The average assessment of the level of knowledge about AI (M = 2.85) is higher than the assessment of competences related to its use (M = 2.65). In both cases, however, the ratings are below the neutral midpoint. Respondents' assessments of their competences in using AI show greater variability than their assessments of knowledge about AI.

Correlations

To determine the relationships between students' self-assessment and their views on the ethical and moral aspects of using artificial intelligence, as well as their general attitudes towards AI and their assess-

ments of knowledge and competences in this area, an analysis of Spearman's rank correlation coefficients was carried out. The results are presented in Table 4. No correlations were found between the variables analyzed and the level of agreement with statements 1 and 2 only.

Table 4. Correlations (Spearman's rho) between the analyzed variables

Variables		1	2	3	4	5	6	7
Positive GAAIS	*Spearman's rho*	-0.088	0.095	**-0.291**	**-0.283**	**-0.207**	**0.154**	**-0.505**
	p	0.186	0.154	**< 0.001**	**<0.001**	**0.002**	**0.021**	**< 0.001**
Negative GAAIS	*Spearman's rho*	-0.036	0.015	**-0.220**	**-0.265**	**-0.135**	0.072	**-0.260**
	p	0.590	0.824	**< 0.001**	**< 0.001**	**0.042**	0.280	**< 0.001**
Level of knowledge about AI	*Spearman's rho*	0.020	-0.097	0.029	-0.030	-0.010	-0.046	-0.095
	p	0.764	0.146	0.665	0.652	0.886	0.488	0.157
Competencies in the use of AI	*Spearman's rho*	-0.037	-0.033	**-0.216**	**-0.200**	**-0.158**	-0.011	**-0.240**
	p	0.584	0.625	**0.001**	**0.003**	**0.017**	0.866	**< 0.001**

Statements: see Table 1.
Statistically significant associations are shown in bold.
Source: Authors' research

The level of acceptance of Statement 3 was negatively correlated with both the positive and negative GAAIS subscales, as well as with self-assessed competence in the use of AI. This means that the more strongly respondents agreed that using artificial intelligence to complete assignments and exams constitutes cheating or plagiarism, the less positive their attitudes towards the benefits of AI, the less understanding their attitudes towards its disadvantages, and the lower their self-assessed competence in using AI. The strength of these correlations was weak.

Similarly, the level of acceptance of Statement 4 showed a negative correlation with both GAAIS subscales and with competence in AI use. In other words, the more strongly respondents agreed that using AI to solve tasks and exams is morally wrong, the less positive their attitudes were towards AI, the weaker their understanding of its drawbacks, and

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the lower their self-assessed competence in its use. Again, these correlations were weak.

In the case of Statement 5, a negative correlation was also found with both GAAIS subscales and competence in the use of AI. This suggests that the more strongly respondents agreed with the idea of developing regulations to define the extent to which participants in the educational process may use AI, the less positive their attitudes towards the benefits of AI (weak correlation), the weaker their understanding of its disadvantages (minimal correlation), and the lower their self-assessed competence in using AI (minimal correlation).

The level of acceptance of Statement 6 was positively correlated with the positive GAAIS subscale. This means that the more strongly respondents agreed that students should be prepared for the ethical use of AI in their future professional work, the more positive their attitudes were towards the benefits of AI. However, this correlation was minimal.

Additionally, the level of acceptance of Statement 7 negatively correlated with both GAAIS subscales and with competence in the use of AI. This indicates that the more strongly respondents supported the idea of banning AI tools in educational institutions, the less positive their attitudes were towards AI's benefits (moderate correlation), the weaker their understanding of its disadvantages (weak correlation), and the lower self-assessed competence in using AI (weak correlation).

Discussion

The analysis conducted indicates that students from the pedagogical university generally rate their ethical use of AI positively. A total of 65.04% of respondents claim that they always follow ethical principles. However, it should be noted that one in ten admit they do not. A similar percentage (67.70%) report paying attention to privacy and information security issues when using AI, though nearly one in five students is not interested in them. Slightly more than half (50.45%) believe that using AI to complete assignments and exams constitutes cheating or plagiarism,

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while only 45.13% agree that using AI-based tools for this purpose is morally wrong.

A closer analysis reveals that among those with a positive self-assessment of their ethical use of AI, just over half (83 out of 147) believe that using AI for exams constitutes plagiarism, and about half (72 out of 147) believe it is morally wrong. For comparison, a study by BestColleges found that more than half (54%) of students believe the use of AI tools during university classes constitutes cheating or plagiarism (Nam, 2023). In contrast, over 70% of participants in a study by Cabała et al. (2023) believe that using ChatGPT in class is ethical. Findings from various studies on the ethical use of AI and the willingness to use AI are not clear (see, e.g., Cuéllar et al., 2022; Cabała et al., 2023; Shao et al., 2024). Some suggest that increased awareness of ethical concerns may reduce willingness to adopt AI, while others find that those who consider AI use ethical are more likely to see it as useful.

Most respondents in our study (72.12%) support the development of a regulatory system that would define how students, pupils, and teachers may use AI in education. Students tend to favor clear, well-structured guidelines (Álvarez-Álvarez & Falcon, 2023). At the same time, a significant majority (69.47%) oppose banning the use of AI in educational institutions. Although students support the development of regulations, those with more positive attitudes toward the benefits of AI and higher competence in its use are more likely to believe that such regulation is unnecessary. Other research has shown that exposure to information about the implementation of AI regulations increases the importance that users attach to various ethical issues and is associated with slower rates of AI adoption (Cuéllar et al., 2022).

Equipping students with the skills and knowledge necessary for success in their future professions, in which AI will play a major role, is an essential aspect of education (Herane, 2024; UNESCO, 2021). It is noteworthy that 85.84% of respondents in our study support preparing students for the ethical use of AI-based tools in their future careers. Similarly, American teachers point out the need for at least basic education on the ethical use of AI, with 60% recommending comprehensive instruction

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in this area (Hamilton, 2024). Well-designed educational programs have the potential to change both attitudes towards AI and willingness to adopt it (Choi et al., 2024). Although many free online training courses on the use of AI are currently available, also in education, respondents expressed a clear expectation that ethical preparation for AI use should be integrated into formal academic curricula.

Our research shows that students have more positive attitudes towards the benefits of AI than the level of understanding of its disadvantages. It is worth noting that the average scores on both the negative and positive GAAIS subscales are statistically significantly lower than those reported in English and Turkish studies using the same tool (Baum & Trzcińska-Król, 2024; Kaya et al., 2022; Schepman & Rodway, 2020, 2023). Correlation analysis revealed that students who have more positive attitudes toward the benefits of AI and a better understanding of its disadvantages are less likely to agree that: using AI for assignments and exams constitutes cheating or plagiarism and is morally wrong; regulations should be developed to specify the extent of AI use in education; or that AI tools should be banned in educational institutions. Respondents who support preparing students for the ethical use of AI in their future work also tend to have more positive attitudes towards the benefits of AI.

Students rated both their knowledge and competences in using AI as below neutral, with knowledge rated slightly higher. This may be due to a lack of formal education in this area. Correlation analysis further revealed that individuals who rated their AI-related competences higher were also less likely to agree that: using AI for assignments and exams constitutes cheating or plagiarism and is morally wrong; regulations should be developed specifying the degree of AI use in education; or that AI should be banned from educational institutions. Lucas and colleagues (2024) found a significant positive relationship between AI knowledge, trust in AI, and digital competence, with AI knowledge emerging as a strong and consistent predictor of AI trust. Moreover, their findings suggest that digital competences do not influence attitudes towards AI.

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Conclusions

One of the biggest challenges that teachers face today is plagiarism. Students are already turning in AI-generated essays as their own. In response, New York public schools have banned the use of AI-based tools that could facilitate cheating. But are such bans truly a solution to potential problems? Would it not be more effective to supplement study programs with content related to artificial intelligence, to develop digital competences and AI-related skills for use in education, and to prepare students for critical engagement with AI?

Rather than penalizing students for using publicly available tools, educational institutions should establish clear guidelines for the ethical use of AI and begin gradually implementing them in academic practices. It is essential to equip both students and teachers with the knowledge and skills necessary to use AI-based technologies effectively and ethically.

Research shows that students have a generally positive attitude towards the implementation of AI tools in education, recognizing their potential in both teaching and learning. However, a concerning trend is that individuals with higher competences in using AI and more positive attitudes toward it often do not see a need to introduce regulations regarding its use in educational institutions. Moreover, they do not necessarily consider the use of AI in assignments or exams as unethical behavior, such as cheating or plagiarism.

In light of these findings, it becomes especially important to appropriately prepare future teachers and specialists to work in educational environments where AI may become an integral component of children's and youth education. A key challenge is the development of academic programs supplemented with content related to the use of AI in education. Maciej Sysło (2022) proposes such solutions at the primary school level and presents a framework for an AI Module that should be included in the curriculum. This solution may become a valuable reference for developers of higher education curricula and policymakers in the field of academic education.

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