AI in Higher Education: Student Motivations, Acceptance, and Emerging Signs of Dependency

Covaci Iustina-Andrada[1], Mitea Diana-Maria[2*] and Stoica Claudia[3]

[1] Lucian Blaga University, Faculty of Economic Sciences, Sibiu, Romania, iustinaandrada.covaci@ulbsibiu.ro
[2] Lucian Blaga University, Faculty of Economic Sciences, Sibiu, Romania, dianamaria.mitea@ulbsibiu.ro
[3] Lucian Blaga University, Faculty of Economic Sciences, Sibiu, Romania, claudia.stoica@ulbsibiu.ro
* Correspondence: dianamaria.mitea@ulbsibiu.ro

Abstract: The increasing integration of Artificial Intelligence (AI) tools into higher education is reshaping students' approaches to learning and academic performance. This study investigates the motivations behind university students' use of AI and examines how their perceptions, particularly regarding usefulness, ease of use, and behavioral intention, relate to actual usage patterns and potential dependency. Grounded in the Technology Acceptance Model (TAM), the research employs a quantitative, exploratory design based on survey data collected from 94 students enrolled at the Faculty of Economic Sciences, Lucian Blaga University of Sibiu, Romania. Results indicate broadly positive attitudes toward AI, with high average scores across all TAM dimensions and frequent usage driven by motivations such as enhanced understanding, time efficiency, and solution clarity. However, the data also point to emerging concerns, including signs of overreliance, avoidance of critical thinking, and habitual use even when unnecessary. These findings highlight the dual role of AI as both an enabler and a potential inhibitor of deeper cognitive engagement. The paper concludes by emphasizing the need for strategic, ethically informed integration of AI in academic settings to maximize benefits while mitigating risks to student autonomy and intellectual development.

Key words: Artificial Intelligence, Technology Acceptance Model, Student Motivation, Digital Learning Tools

JEL classification: I2, O31, O33

1. Introduction

The rapid advancement of artificial intelligence (AI) has transformed various sectors, including education, where AI tools such as ChatGPT, Grammarly, and GitHub Copilot are increasingly integrated into academic activities. These tools offer significant benefits, such as improving academic performance, accelerating task completion, and simplifying complex concepts. However, their widespread adoption raises critical questions about the potential for overreliance or dependency among students. While the Technology Acceptance Model (TAM) provides a framework for understanding how perceived usefulness (PU), ease of use (PEOU), attitude toward use (ATU), and behavioural intention (BI) influence technology adoption (Ghani, et al., 2019), less is known about how these factors may correlate with perceived dependence or addiction tendencies in an academic context.

The primary motivation for this study stems from the growing debate surrounding the ethical and psychological implications of AI integration in education. While AI tools undeniably enhance productivity and learning outcomes, their excessive use may lead to diminished critical thinking skills, academic dependency, and even addiction-like behaviours. This research seeks to determine whether students' positive perceptions of AI, rooted in its utility and ease of use, inadvertently foster reliance that goes beyond healthy adoption. By examining this phenomenon through the lens of TAM, we aim to uncover whether the very factors that drive technology acceptance also contribute to dependency. The findings will provide valuable insights for educators and policymakers to design balanced AI integration strategies that maximize benefits while mitigating risks.

This paper is systematically structured to provide a rigorous investigation into the integration of artificial intelligence (AI) within educational contexts. Commencing with an extensive review of the extant literature on AI applications in education and the Technology Acceptance Model (TAM), this study establishes a robust theoretical foundation. Subsequently, the methodological framework is explicated, detailing the deployment of a quantitative survey instrument administered to a representative cohort of university students. This empirical approach facilitates a comprehensive assessment of their AI utilization patterns, perceptual dispositions, and emergent dependency tendencies. The analytical segment presents a rigorous examination of the dataset, elucidating salient correlations between TAM constructs, and discernible indicators of AI dependency. The ensuing discussion critically engages with these findings, situating them within the broader scholarly discourse on educational technology. Furthermore, empirically substantiated recommendations are posited to foster judicious AI adoption in academic environments.

By synthesizing insights from technology acceptance research and behavioural dependency paradigms, this study endeavours to advance a more nuanced and theoretically informed understanding of AI's pedagogical implications. The ultimate objective is to ensure that AI integration augments, rather than undermines, students' cognitive development and scholarly autonomy.

2. Literature Review

Artificial Intelligence (AI) has become an essential tool in education, offering students enhanced learning opportunities and simplifying academic tasks. Tools such as ChatGPT, Grammarly, or GitHub Copilot are frequently used for completing homework, generating explanations, correcting texts, or brainstorming. Survey data across various

studies confirms this trend, with many students reporting frequent use, daily or several times a week. The main motivations include time-saving, clearer understanding of concepts, and the availability of structured solutions.

To better understand students' interaction with such tools, it is necessary to employ theoretical models like the Technology Acceptance Model (TAM), which explains how individuals adopt new technologies based on perceived usefulness and ease of use. According to TAM, the likelihood of adopting AI tools increases when students find them effective in improving academic performance and easy to interact with. These dimensions are often measured through indicators such as (Masrom, 2007; Granić & Marangunić, 2019; Ghani, et al., 2019):

- Perceived Usefulness (PU): The belief that AI helps improve learning outcomes, facilitates faster task completion, and aids in understanding complex ideas.
- Perceived Ease of Use (PEOU): The perception that AI tools are intuitive and require minimal mental effort to operate.
- Attitude Toward Use (ATU): The overall positive or negative feelings toward using AI in academic contexts.
- Behavioral Intention to Use (BI): The extent to which individuals intend to continue using AI or recommend it to others.

Beyond these adoption factors, literature also highlights emerging concerns regarding overuse or dependency on AI tools (Young, 1998; Huang, et al., 2024; Naseer, Ahmad, & Chishti, 2025) Frequent users, especially those who rely on AI for a large proportion of their academic work, may experience reduced engagement in critical thinking or self-driven learning. Statements such as "I feel stuck without AI" or "I avoid thinking too much when I use AI" are indicative of a shift from support to reliance. Although time efficiency is a major advantage, it is sometimes achieved at the expense of cognitive effort or independent source verification.

In parallel, the integration of AI in education is part of a broader process of digital transformation. AI supports a range of academic functions, from intelligent tutoring and automated grading to plagiarism detection and adaptive learning platforms, enabling more personalized, scalable, and flexible learning environments. Universities adopt AI not only to improve teaching and learning, but also to streamline administrative processes and enhance decision-making through data-driven insights.

However, successful integration depends heavily on students' attitudes toward technology. Perceived benefits, prior digital experience, and digital literacy levels influence acceptance, while concerns about data privacy, transparency, or over-reliance may hinder full adoption. Therefore, promoting responsible and informed use of AI becomes a key priority.

Overall, the academic literature suggests that while AI brings substantial benefits to education, it also introduces challenges related to autonomy, ethics, and cognitive engagement. It is essential for educational policies to address these tensions, encouraging innovation while preserving academic integrity and fostering critical thinking skills.

3. Research methodology

This research adopts a quantitative and exploratory approach, aiming to investigate the motivations behind students' use of artificial intelligence (AI) in academic contexts. Grounded in the Technology Acceptance Model (TAM), the study adapts this theoretical framework to the context of higher education in order to better understand students' attitudes and behavioural intentions toward AI-based tools. This methodological perspective allows both the measurement of acceptance levels and the identification of usage patterns, offering insights relevant for future educational strategies and the integration of such technologies into learning environments.

The target population includes students from the Faculty of Economic Sciences at Lucian Blaga University of Sibiu, which, according to institutional data, comprises approximately 2399 individuals. Data collection was carried out via an online questionnaire distributed to this population, resulting in 94 valid responses. Although the sample size represents a relatively small proportion of the total student population (94 out of 2,399), it provides valuable insights within the framework of exploratory research, especially given the emerging nature of AI usage in academic settings. At a 95% confidence level, the estimated margin of error is approximately ±9.6%. While this limits the possibility of strict statistical generalization to the entire population, the sample remains adequate for identifying meaningful trends and informing preliminary conclusions.

The primary instrument for data collection was a structured questionnaire created in Google Forms. It was divided into several sections, covering demographic information such as gender, age, level and year of study, as well as aspects related to the frequency and type of AI use in academic contexts. A key component of the questionnaire was a series of items based on TAM, grouped into four main dimensions: perceived usefulness, perceived ease of use, attitude toward AI, and behavioral intention to use in the educational process. In addition to these, the instrument included open-ended and multiple-choice questions designed to capture students' motivations and preferences regarding AI tools.

Responses to TAM-related items were measured using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). To ensure content validity, the questionnaire was pilot-tested with a small group of students prior to the full data collection. The survey was active during April and May 2024 and was shared with students enrolled in the Faculty of Economic Sciences. Participation was entirely voluntary, with respondents being informed about the objectives of the research and their rights, including anonymity and data confidentiality. No identifying information was collected, and participation was not incentivized in any way.

The quantitative analysis was performed using Microsoft Excel. Initial steps included coding responses, extracting scores for each TAM dimension, and calculating individual averages using built-in functions. Descriptive

statistics were then computed for each dimension, including measures of central tendency (mean and median), dispersion (standard deviation), and distribution (minimum, maximum, and selected percentiles). Visual representations such as frequency charts were generated to illustrate the distribution of responses and the patterns of AI use among students. Where relevant, open-ended responses were also processed to generate visual summaries such as word clouds, offering additional insights into the personal motivations and tools mentioned by participants.

Throughout the research process, ethical principles were fully respected. Participants gave informed consent, and all data were treated with strict confidentiality. The study ensured anonymity, with all information being used solely for academic purposes, in compliance with relevant ethical guidelines for social research.

4. Results and Discussions

4.1 Demographic Overview of Respondents

As previously mentioned, the final sample included 94 valid responses. All participants were enrolled in a Bachelor's degree program in the Faculty of Economic Sciences at Lucian Blaga University of Sibiu. The gender distribution (Figure 1) shows a higher participation rate from female students (highlighted in blue), which aligns with common demographic patterns in social science surveys.

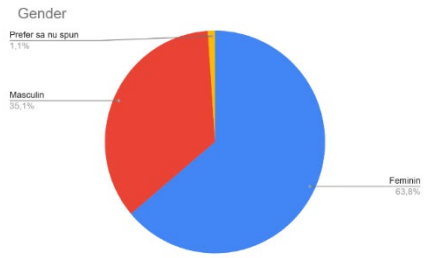

Figure 1. Gender Distribution
Source: Authors' own work, based on collected responses

Furthermore, the age distribution (Figure 2) reflects a typical undergraduate population, concentrated around early adulthood.

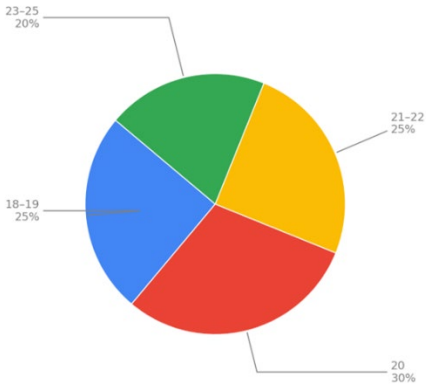

Figure 2. Age Distribution
Source: Authors' own work, based on collected responses

A majority of respondents were first-year students (Figure 3), suggesting a heightened curiosity and openness to technology like AI among newcomers.

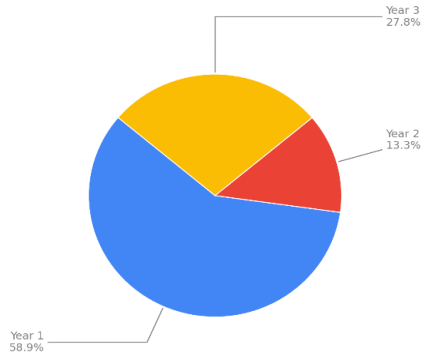

Figure 3. Year of Study
Source: Authors' own work, based on collected responses

4.2 Overview of TAM Dimensions

This section presents the results of the quantitative analysis based on the responses collected from students at the Faculty of Economic Sciences. The data are structured according to the three dimensions of the TAM model: Perceived Usefulness, Perceived Ease of Use, Attitude toward AI, and Behavioral Intention to Use. Additionally, the frequency and type of AI usage in academic activities were analysed.

Table 1. Overview of TAM Dimensions

TAM Dimension	Average Score	General Interpretation
Perceived Usefulness	4.18	Students perceive AI as a helpful tool for learning
Perceived Ease of Use	4.12	Most respondents consider AI easy to use
Attitude toward AI	4.05	General positive attitude towards the use of AI
Behavioral Intention to Use	3.92	Increased intention to use AI in educational settings

Source: Author's Own Work

As shown in Table 1, all four dimensions recorded average scores above 3.90 on a 5-point Likert scale, indicating generally favourable perceptions of AI technologies among students. The consistently high scores suggest a supportive context for the integration and continued use of AI tools in academic settings.

- Perceived Usefulness (PU) – Mean: 4.18: Students generally recognize AI tools as valuable aids in their educational journey. Many respondents stated that AI helps them better understand theoretical concepts, facilitates the structuring of assignments, and improves overall learning efficiency.
- Perceived Ease of Use (PEOU) – Mean: 4.12: Respondents perceive AI tools as user-friendly, requiring minimal effort to learn or implement. Features such as intuitive interfaces, accessible platforms, and real-time assistance contribute to this positive evaluation.
- Attitude toward AI (ATAI) – Mean: 4.05: This score reflects a broadly positive emotional and cognitive stance toward AI in education. Most students reported openness to AI, curiosity in exploring new tools, and a willingness to integrate them into future learning experiences.
- Behavioral Intention to Use (BIU) – Mean: 3.92: Although slightly lower than the other dimensions, this score still indicates a strong intention among students to continue using AI in academic contexts. It may also suggest that while students are generally positive about AI, some remain cautious or undecided about relying on it long-term, potentially due to ethical concerns or uncertainty about its educational impact.

4.3 Descriptive Statistics for TAM Dimensions

The current subsection presents a deeper look into the descriptive statistics associated with the three core dimensions of the Technology Acceptance Model (TAM), as applied to the perceptions of students regarding AI tools. These metrics, i.e. mean, standard deviation, percentiles, and range, offer valuable insights into the consistency and distribution of student responses.

Table 2. Descriptive Statistics of TAM Dimensions

Indicator	Perceived Usefulness	Perceived Ease of Use	Attitude toward AI	Behavioral Intention to Use
Number of Respondents	94	94	94	94
Mean	4.18	4.12	4.05	3.92
Standard Deviation	0.77	0.75	0.91	0.97
Minimum Score	1.00	1.00	1.00	1.00
25^{th} Percentile	3.80	3.67	3.50	3.25
Median (50^{th} Percentile)	4.40	4.20	4.25	4.00
75^{th} Percentile	4.80	4.80	5.00	4.75

Maximum Score	5.00	5.00	5.00	5.00

Source: Author's Own Work

The statistical indicators displayed in Table 2 reinforce the general trends observed in the previous analysis, while providing more granular insights into how student perceptions vary across the three TAM dimensions.

Mean Scores remain relatively high for all dimensions, with Perceived Usefulness (4.18) and Perceived Ease of Use (4.12) slightly ahead of Attitude toward AI (4.05) and Behavioral Intention to Use (3.92). These values indicate that students generally recognize the usefulness of AI in academic contexts and find it relatively easy to adopt in their study routines.

Standard Deviations suggest varying degrees of consensus among respondents. Perceived Usefulness (0.77) and Perceived Ease of Use (0.75) reflect moderately consistent views. In contrast, Attitude toward AI (0.91) and Behavioral Intention to Use (0.97) exhibit greater variability, pointing to more diverse opinions, possibly related to ethical concerns, trust in AI, or uncertainty about long-term implications.

Percentile Values offer deeper insights into response distributions:

- The 25th percentiles show that even the lower quartile of responses remains relatively high (above 3.25 in all dimensions), indicating a solid baseline of acceptance among students.
- The medians and 75th percentiles confirm that the majority of students rated their agreement above 4.00, highlighting a predominantly positive stance toward AI in education.

Minimum and Maximum Scores span the full range from 1.00 to 5.00 across all dimensions. This indicates that while most students are favourable toward AI, a minority express strong disagreement, underscoring the presence of individual scepticism or reservations.

Overall, the data reflect a generally optimistic attitude toward AI's role in education, especially in terms of its perceived practicality and ease of integration. However, the wider spread in Attitude and Behavioral Intention scores suggests the need for further qualitative research to explore the roots of hesitation or divergent perspectives among students.

4.4 Actual use and frequency of Using AI in Educational Settings

Understanding the motivations behind AI usage is crucial in gauging how students perceive and integrate these technologies into their academic lives. Table 3 provides insights into both practical and emotional factors that influence AI adoption, shedding light on the different ways students interact with AI and the role it plays in their learning experiences.

Table 3. Frequency of Motivation of Using AI

Motivation	Number of Selections	Percentage (out of 94)
Helps me understand better	80	85.1%
Saves time	72	76.6%
Provides clear solutions	61	64.9%
Helps when I have no other support	44	46.8%
Out of curiosity / entertainment	39	41.5%

Source: Author's Own Work

The most commonly cited motivation is "Helps me understand better" (85.1%), indicating that students primarily turn to AI for enhanced comprehension of academic material. This underscores AI's role as a learning aid that complements traditional instruction. The second most frequent motivation, "Saves time" (76.6%), highlights AI's perceived efficiency and time-management benefits. Together, these top two reasons suggest that students view AI as a practical tool that can improve both learning quality and productivity.

"Provides clear solutions" (64.9%) also ranks highly, suggesting that many students value AI for its ability to deliver direct, actionable answers, possibly in areas where conventional resources are too complex or time-consuming.

Less frequently, students reported "Helps when I have no other support" (46.8%), pointing to a secondary, but significant, emotional or situational motivation. This may reflect cases where students feel isolated or lack immediate help from peers or instructors.

Finally, "Out of curiosity/entertainment" (41.5%) reveals that a notable portion of students engage with AI beyond academic needs, either to explore its capabilities or for casual interaction, which reflects growing familiarity and comfort with AI technologies.

The pie chart below (Figure 4) presents the distribution of responses among participants regarding their usage of artificial intelligence in educational contexts. The majority of respondents (52.1%) reported using AI several times a week (blue segment), indicating a high level of integration of AI tools in their educational routines. Two other notable

groups are those who use AI daily (orange, 14.9%) and those who use it several times a month (green, 14.9%), further reflecting the growing reliance on AI in educational environments. Less frequent use was reported by:, those who use it once a week (yellow, 7.4%), once a month (red, 3.2%), and rarely or occasionally (cyan/light blue, 6.4%). A very small minority (1.1%) reported not using AI at all (gray segment).

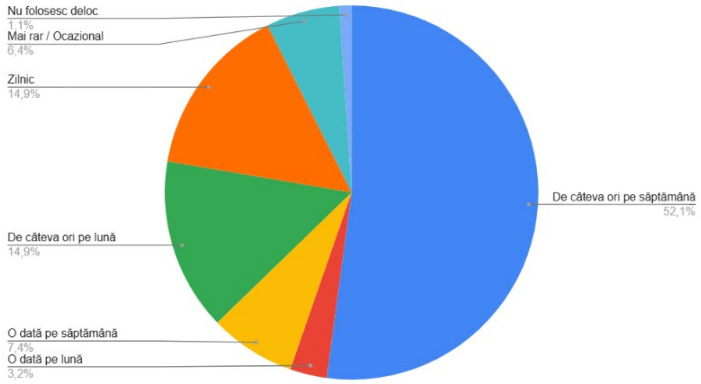

Figure 4. Participants' Reported Frequency of Using AI for Educational Purposes
Source: Authors' own work, based on collected responses

This distribution highlights a trend toward the regular and frequent use of AI among learners or educators, with over 80% of respondents indicating at least weekly usage. The findings suggest that AI technologies have become a significant tool in modern educational practices.

4.5 Perceived Dependency and Tendency Toward AI Addiction

To explore the psychological and behavioral implications of AI use in education, a set of five items was designed to measure perceived dependency and a potential tendency toward addictive patterns. These items assessed students' reliance on AI in academic contexts, including emotional discomfort when AI is inaccessible, habitual use for simple tasks, avoidance of critical thinking, and the perception of AI as essential for completing homework. An illustrative item includes "I feel stuck when I cannot access AI for academic tasks," highlighting a possible emotional reliance. Another item, "I have started to avoid critical thinking, letting AI 'think' for me," reflects a cognitive displacement, where AI use may inhibit independent intellectual engagement.

The mean score obtained across these items was 2.28 on a Likert scale, suggesting a relatively low to moderate level of perceived dependency. While this average does not indicate a strong tendency toward addiction, it does reveal a meaningful pattern of mild reliance, particularly in terms of convenience and reduced cognitive effort. The finding that some students report using AI even when it is not strictly necessary points toward the early signs of habitual or automatic behavior.

These results warrant further investigation into the long-term cognitive and motivational consequences of AI use in educational settings. While AI can be a powerful support tool, its overuse or uncritical reliance may interfere with the development of essential academic skills such as independent reasoning, problem-solving, and self-efficacy.

4.6 Relationship Between TAM Dimensions, Usage Motivations, and Perceived Dependency

The results from the TAM analysis (Section 4.2 and 4.3) revealed a generally positive perception of AI tools among students, with all four core dimensions, i.e. Perceived Usefulness (4.18), Perceived Ease of Use (4.12), Attitude toward AI (4.05), and Behavioral Intention to Use (3.92), scoring well above the midpoint on a 5-point Likert scale. These findings suggest that students view AI technologies as practical, accessible, and valuable resources in their educational journeys. However, when these results are interpreted alongside the data presented in Sections 4.4 and 4.5, a more complex and nuanced picture begins to emerge.

The motivations reported in Section 4.4 strongly support the high TAM scores, particularly in terms of Perceived Usefulness. The most cited reasons for using AI - "Helps me understand better" (85.1%) and "Saves time" (76.6%) - are consistent with the functional and performance-enhancing aspects captured by the TAM framework. These motivations reflect that students are not only receptive to AI technologies but also actively rely on them to improve learning outcomes and efficiency. The co-occurrence of motivational factors (e.g., clarity, support in the absence of human help) further reinforces the idea that AI tools are integrated deeply into the academic experience.

However, the findings in Section 4.5 concerning perceived dependency raise important considerations about the boundaries of this integration. Although the average dependency score (2.28) indicates a low to moderate level of reliance, specific item-level responses, such as using AI even when unnecessary or avoiding critical thinking, hint at potential overuse and cognitive disengagement. This observation contrasts with the otherwise positive evaluations found in the TAM dimensions. It is possible that high Perceived Usefulness and Ease of Use may inadvertently encourage habitual or automatic reliance on AI, leading to reduced self-directed learning.

Moreover, the relatively lower score in Behavioral Intention to Use (3.92) compared to Attitude toward AI (4.05) could reflect an emerging awareness among some students about the risks associated with dependency. The discrepancy might suggest that while students value AI and feel positively about it, they are also beginning to question the appropriateness of its continuous use in all academic situations.

In this context, the positive TAM perceptions and frequent usage motivations must be balanced against the early signs of behavioral overreliance. The convergence of these findings suggests that while AI offers considerable benefits for educational enhancement, it may also present risks related to dependency, especially if students are not guided in developing critical engagement and autonomous learning habits.

5. Conclusions

This study provides a comprehensive exploration of how artificial intelligence (AI) tools are being integrated into the academic routines of undergraduate students at the Faculty of Economic Sciences, Lucian Blaga University of Sibiu. The findings underscore a clear trend: students increasingly rely on AI technologies not only to improve learning efficiency and task management, but also to support their understanding of academic content. The consistently high scores across all dimensions of the Technology Acceptance Model (TAM), particularly in perceived usefulness and ease of use, demonstrate strong student confidence in AI as a reliable educational aid. Students appear to value AI most for its ability to provide structured, comprehensible, and timely assistance during independent study.

Importantly, the motivations behind AI usage extend beyond utilitarian goals. While efficiency and clarity remain primary drivers, the data reveal deeper psychological and emotional factors. For many students, AI serves as a compensatory mechanism in the absence of academic support, suggesting that AI tools may fill critical gaps in student guidance and feedback. Additionally, curiosity and a desire to explore new technologies further motivate engagement, indicating that students are not merely passive users, but active experimenters with evolving digital learning environments.

However, the study also points to emerging concerns about the overuse of AI tools. The moderate average score (2.28) on the perceived dependency scale suggests that while most students do not report addictive behaviors, a significant number exhibit early signs of habitual reliance. The tendency to use AI even for simple tasks or to avoid critical thinking raises questions about the long-term impact on student autonomy, cognitive development, and academic integrity. These concerns are especially relevant when viewed in relation to the high behavioral intention to use AI tools, indicating that favourable perceptions may inadvertently encourage uncritical dependence.

Taken together, the findings highlight the need for balanced and responsible integration of AI technologies in education. While students are open and optimistic about AI, institutions must provide a guiding framework that includes clear policies, ethical standards, and support from faculty members. Such frameworks are essential to ensure that AI remains a complementary tool that enhances learning, rather than a substitute for cognitive engagement and personal effort.

AI has the potential to transform higher education, but this transformation must be managed with pedagogical foresight and strategic governance. By fostering digital literacy, promoting self-regulated learning, and ensuring equitable access, educational institutions can harness the benefits of AI while mitigating its potential drawbacks. Ultimately, the successful integration of AI will depend not only on technological advancement, but on the human capacity to use it wisely.

While this study offers valuable insights into students' motivations, perceptions, and behavioral intentions regarding AI use in academic contexts, key main limitations must be acknowledged. These limitations, inherent to the study's design and scope, also inform potential avenues for future research.

First, the study relies on a relatively small and non-random sample of 94 students from the Faculty of Economic Sciences at Lucian Blaga University of Sibiu. Although this sample size is acceptable for an exploratory investigation, it represents only a fraction of the total faculty population (approximately 3.9%) and yields a margin of error of ±9.6% at a 95% confidence level. Consequently, the findings cannot be generalized with high statistical confidence to the broader student population. Thus, future studies should aim to include larger, randomly selected samples from multiple faculties or institutions to enhance representativeness and external validity.

Second, the current research focuses exclusively on a single institutional context. The use of a geographically and academically limited sample may not capture the full diversity of perspectives across different educational systems or cultural environments. Expanding the scope of investigation to include other universities, nationally or internationally, would allow for comparative analyses and more robust conclusions about the role of AI in varied educational settings.

Third, the study employs a purely quantitative design, which, while effective in identifying patterns and trends, does not capture the depth and complexity of individual experiences with AI. The structured questionnaire format, though standardized and efficient, may constrain participants' ability to express nuanced views or contextual motivations. To address this, future research could incorporate qualitative methodologies such as semi-structured interviews, focus groups, or case studies. These approaches would offer richer insights into students' attitudes, ethical considerations, and critical thinking behaviors associated with AI use.

Moreover, although the study measured key constructs from the Technology Acceptance Model (TAM), it did not examine potential moderating variables such as digital literacy, academic performance, or previous exposure to AI tools. Incorporating such variables in future models would allow for more granular analysis of the factors shaping AI

adoption. Additionally, the psychological dimension of dependency, while explored through a separate set of items, could be more rigorously validated and examined through longitudinal studies that track behavioral changes over time.

In summary, the current study lays a foundational understanding of AI adoption in higher education from the student perspective. However, further research, both broader in scope and deeper in analysis, is needed to fully grasp the pedagogical, psychological, and ethical implications of AI use in academic life.

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