

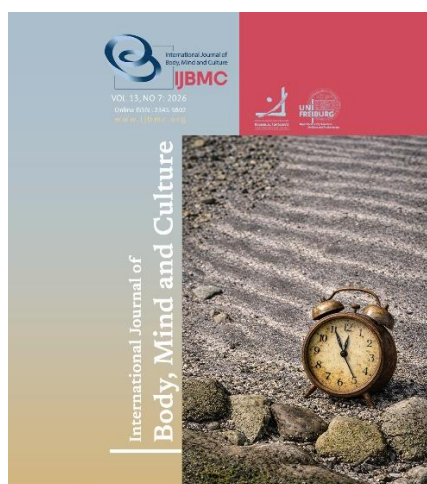
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Exploring the Relationship between AI Dependency and Academic Self-Efficacy: A Study of Diyala University Students

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ABSTRACT

Objective: This research was conducted to assess the relationship between academic self-efficacy and dependence on artificial intelligence among students at Diyala University.

Methods and Materials: The research was a descriptive cross-sectional design, conducted with 380 students at Diyala University. In collecting data, four tools were used for data collection: the Socio-Demographic Characteristics of the Student, Students' Information and Opinions Regarding Artificial Intelligence Technology, the Academic Situations Specific Perceived Self-Efficacy Scale (ASSPSE), and the Artificial Intelligence Dependence Scale. The data were analyzed and interpreted using the application Statistical Package for Social Sciences (SPSS), version 26.0. Data were analyzed using descriptive statistics, Kolmogorov–Smirnov, Shapiro–Wilk, Spearman, Mann Whitney U, and Kruskal–Wallis tests.

Findings: The result was that more than half of university students (54.5%) perceive moderate academic self-efficacy, while more than half of university students (56.6%) demonstrate low dependency on AI.

Conclusion: The results of this study indicate a significant negative correlation between dependence on artificial intelligence and perceived academic self-efficacy among university students. This indicates that higher dependence on AI is associated with lower levels of academic self-efficacy.

Keywords: Artificial Intelligence, Dependence, Academic Self-Efficacy, University Students.

Introduction

The academic education stage is basic in the student's journey, as its importance extends beyond laying the foundation for professional development to include skills development (Torres Cardeña, 2019). This process enhances students' ability to address educational challenges and enables them to provide meaningful support to society (Bernate & Guativa, 2020). In this area, believing in their own academic abilities is an important psychological factor, as achieving success with the increasing complexity of schoolwork depends on more than just what they have learned from experience. Students must adapt to advanced academic standards, which necessitate the development of fundamental competencies and effective management of their time and resources.

Academic self-efficacy, a specific dimension of general self-efficacy, directly impacts the educational environment. Academic self-efficacy refers to students' beliefs in their ability to face and overcome challenges in the university environment (Høigaard et al., 2015). This construct dates back to Bandura's (1977) theory of self-efficacy, which defines it as a person's belief in their ability to organize and execute the actions necessary to achieve specific outcomes. Self-efficacy theory points out four main ways that people build this belief in themselves: first, through mastery experience, which comes from past successes that boost confidence; second, through indirect experience, which involves seeing others succeed; third, through verbal persuasion, which is positive feedback from people close to them; and fourth, through physiological and emotional states, which influence how someone views their abilities.

Right now, how students feel about their academic abilities directly affects their success in school, as those who believe in themselves usually put in more effort, keep trying when things get tough, and develop better ways to learn. A wide range of factors can influence academic self-efficacy, including psychosocial support, personal expectations, and previous academic experiences. Social attribution of friends, family, and academic professionals can greatly affect learners by developing a safe and reliable environment (González-Cantero et al., 2021). In a related context, students who set clear and achievable goals tend to show higher self-

efficacy, as they can visualize their path towards achieving them more realistically (Saks, 2024).

While academic self-efficacy refers to students' ability to face academic challenges with confidence and effectiveness, assessing the effects of these developments is an essential step in understanding their impact through modern digital tools, especially artificial intelligence (AI) applications. To enhance performance and efficiency through effective academic support, a wide range of students use artificial intelligence tools because they are easy to access and provide knowledge and customized guidance that offer practical support in solving academic problems (Estrada-Araoz et al., 2024). Artificial intelligence (AI) is a field encompassing technologies that imitate intelligent human behavior, including machine learning, computer vision, and natural language processing. Today, with advances in technology, AI applications are used in many areas, and healthcare is one of the most common fields where professionals will delegate tasks to AI in the future. Many AI applications, such as telehealth, mobile apps, and smart devices, have been developed for healthcare (Qahtan, 2025).

However, while artificial intelligence techniques can help with learning and boost self-confidence, overusing these technologies may cause students to rely on them too heavily, which can hurt their confidence and ability to learn and develop skills on their own (Huang et al., 2024).

Dependence on artificial intelligence is characterized by a persistent, compulsive need to use AI technologies for academic assignments or problem-solving, while neglecting alternative approaches or trusting one's own capabilities (Morales-García et al., 2024). Providing access to AI tools, available around the clock and designed to be intuitive, can reduce students' motivation to search for solutions independently over time (Chan & Zary, 2019).

Academic pressure from heavy workloads and high expectations in university education may lead many students to seek time-saving solutions, and artificial intelligence tools provide quick, effective solutions that often increase dependence on these technologies (Seo et al., 2021). Overreliance on AI in academia may adversely affect the cultivation of essential abilities in students, including self-regulation and critical thinking (Zhai et al., 2024). Education plays an important role in preventing

students from relying excessively on artificial intelligence (Ahmad et al., 2023). By employing digital learning methodologies and fostering self-regulation, instructors can help students recognize that AI is a beneficial tool rather than a substitute for their capabilities (Darvishi et al., 2024).

This research aimed to determine the correlation between academic self-efficacy and dependence on artificial intelligence among students at the University of Diyala. This research is relevant because it addresses a contemporary issue due to the increasing prevalence of artificial intelligence in education. The regular use of AI tools may affect self-efficacy perceptions, as they provide quick and accessible solutions that reduce the need to solve problems independently.

Methods and Materials

Study Design

Study design and participants: To achieve the study's aims, researchers employed a cross-sectional, quantitative, descriptive design.

Study Setting: The study was conducted at Diyala University in Baqubah City, a major academic institution in the City. The university is located in the middle of the city. The study community comprises 32,508 university students across various educational levels and scientific disciplines.

A sample of 380 students was selected by non-probability, convenience sampling. The students were distributed among several colleges at the University of Diyala, which were selected by simple random sampling (voting method) from the accessible population of 32,508 students. The colleges included physical education, psychology, Arabic, English, agriculture, science, administration and economics, mathematics, dentistry, medicine, veterinary medicine, and Islamic Sharia. Sample size calculation was performed using the Richard Geiger equation, with a 5% margin of error and a 95% confidence level. The minimum estimated sample size required was 380 respondents. Tools of the study: three tools were used for data collection:

Part 1: This section focuses on the socio-demographic characteristics of the students.

This part is concerned with the collection of demographic data obtained from the students through a questionnaire sheet, which includes (6) items related to

age, gender, marital status, perceived family income, academic level (study stage), and academic major (college).

Part 2: Students' Information and Opinions Regarding Artificial Intelligence Technology

This section focuses on gathering information and perspectives from students about the use of artificial intelligence technologies. The assessment has 12 items that evaluate students' awareness, attitudes, perceptions, and opinions regarding the use of AI in educational and everyday contexts.

Part 3: Academic Situations Specific Perceived Self-Efficacy Scale (ASSPSE)

The Academic Situations Specific Perceived Self-Efficacy Scale (ASSPSE) was administered. This single-factor scale assesses students' confidence in handling specific situations in an academic setting. It comprises 10 Likert-type items with 4 response options (never, sometimes, quite often, and always). The psychometric properties of the questionnaire were evaluated in a previous study conducted in Peru by Dominguez-Lara (2016), which reported high internal consistency ($\alpha = 0.800$).

Part 4: Artificial Intelligence Dependence Scale

The Artificial Intelligence Dependence Scale (Morales-García et al., 2024) was applied to assess the degree to which students depend on AI in their daily academic activities, considering factors such as frequency of use, trust in the technology's recommendations, and the impact of this dependence on decision-making. The single-factor scale consists of 5 items with 5 response alternatives ranging from 1 (completely false for me) to 5 (describes me perfectly).

Validity and reliability of the tools: The tools' validity and reliability were assessed by a panel of 10 experts in college nursing and hospital medicine; the panel agreed and provided comments. The Cronbach's Alpha analysis in this table shows excellent reliability for the "Academic Situations Specific Perceived Self-Efficacy Scale (ASSPSE)" and "Artificial Intelligence Dependence Scale," indicating that the questionnaires had an adequate level of internal consistency and equivalence.

A pilot study was conducted with 10% of the students at Diyala University to assess the tools' lucidity, clarity, feasibility, and applicability. Based on the pilot study

findings, some modifications were made, and those students were excluded from the main study sample.

Inclusion criteria were as follows: students enrolled at Diyala University; undergraduates from different colleges and academic stages (to maintain consistency); pupils who have completed at least one academic semester; participants must provide informed consent and be willing to complete the questionnaires related to the study variables.

Exclusion criteria included students who are not officially enrolled at Diyala University; participants who do not complete the questionnaire will be excluded from the final analysis and the pilot study sample.

Data Analysis

Analyzing data is an essential step in nursing research, in which various methods are employed to describe and assess the information gathered by the researcher. The choice of analysis method depends on the nature of the collected data, with quantitative

research specifically utilizing descriptive and inferential statistics to analyze numerical data (O'Connor, 2020). The data were analyzed and interpreted using the Statistical Package for the Social Sciences (SPSS), version 26.0.

Findings and Results

Table 1 describes the sociodemographic characteristics of the participating students (N = 380); the findings indicate that most students are young adults, with a mean age of 21 ± 2.2 years. The highest percentage is within the 20–21 age group (43.9%). Regarding sex, the sample is slightly male-dominant, with 53.4% males. The majority of students are single (90.3%). Most students perceive their monthly income as moderate (79.5%). The highest percentage of students is in the second academic year (36.1%). Nearly half of the sample belongs to humanistic disciplines (48.9%).

Table 1

Description of Students' Sociodemographic Variables (SDVs) (N= 380)

List	Variables		f	%
1	Age (Years) M±SD= 21±2.2	18 – 19	78	20.5
		20 – 21	167	43.9
		22 – 23	91	23.9
		24 +	44	11.6
2	Sex	Male	203	53.4
		Female	177	46.6
3	Marital status	Single	343	90.3
		Married	34	8.9
		Widowed/ Widower	2	.5
		Divorced	1	.3
4	Perceived monthly income	Low	32	8.4
		Moderate	302	79.5
		High	46	12.1
5	Academic grade	First	77	20.3
		Second	137	36.1
		Third	96	25.3
		Fourth	59	15.4
		Fifth	11	2.9
6	Academic specialty	Medical	46	12.1
		Scientific	148	38.9
		Humanistic	186	48.9

f: Frequency, %: Percentage, M: Mean, SD: Standard deviation

Table 2 shows that university students have low to moderate dependence on AI, with 56.6% reporting it as low and 39.7% as moderate. The mean score is $10.97 \pm$

3.834. Only 3.7% of students show a high level of dependence on AI use.

Table 2

Overall Assessment of Dependence on Artificial Intelligence among University Students (N= 380)

Dependence	f	%	M	SD	Ass.
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Low	215	56.6	10.97	3.834	Low
Moderate	151	39.7			
High	14	3.7			
Total	380	100			

f: Frequency, %: Percentage

M: Mean for total score, *SD*: Standard Deviation for total score, *Ass*: Assessment

Low= 5 – 11.66, Moderate= 11.67 – 18.33, High= 18.34 – 25

Table 3 shows that university students perceive moderate to high levels of academic self-efficacy, with 54.5% reporting moderate and 41.3% reporting high.

The mean score is 29.74 ± 5.242 . Only 4.2% of students perceive a low level of self-efficacy.

Table 3

Overall Assessment of Academic Perceived Self-efficacy among University Students (N= 380)

Self-efficacy	f	%	M	SD	Ass.
Low	16	4.2	29.74	5.242	Moderate
Moderate	207	54.5			
High	157	41.3			
Total	380	100			

f: Frequency, %: Percentage

M: Mean for total score, *SD*: Standard Deviation for total score, *Ass*: Assessment

Low= 10 – 20, Moderate= 20.1 – 30, High= 30.1 – 40

Table 4 illustrates a significant negative correlation between dependence on artificial intelligence and academic perceived self-efficacy among university students ($r = -0.217$, $p = .001$). This indicates that higher dependence on AI is associated with lower levels of

academic self-efficacy. The mean scores further support this interpretation: students show a relatively low level of AI dependence ($M = 10.97 \pm 3.834$) alongside a moderately high level of academic self-efficacy ($M = 29.74 \pm 5.424$).

Table 4

Relationship between Dependence on AI and Academic Perceived Self-efficacy among University Students (N= 380)

Correlation		Dependence	Self-efficacy
Dependence on AI	Pearson Correlation	1	-.217**
	Sig. (2-tailed)		.001
	Mean $\pm$ SD	10.97 $\pm$ 3.834	29.74 $\pm$ 5.424
Academic Perceived Self-efficacy	Pearson Correlation	-.217**	1
	Sig. (2-tailed)	.001	
	Mean $\pm$ SD	10.97 $\pm$ 3.834	29.74 $\pm$ 5.424

***. Correlation is significant at the 0.01 level (2-tailed).*

Discussion and Conclusion

The findings of the present study reveal that the majority of students are young adults, with a mean age of 21 $\pm$ 2.2 years. The majority of participants are between 20 and 21 (43.9%), followed by those between 22 and 23 (23.9%). Only 11.6% of participants are 24 years old or older. This result is consistent with a study conducted in China, which found that most participants were vocational college students, with a significant concentration in the 20–21 age group. This category also demonstrated superior levels of self-efficacy in digital

innovation and greater proficiency in using artificial intelligence applications within educational frameworks (Huang & Li, 2025).

Research in Peru, where 89.2% of participants were aged 16 – 24, further supports these findings (Estrada-Araoz et al., 2025). From the researcher's perspective, the predominance of the 20–21 age group suggests that students at this critical educational juncture face intensive research requirements. This academic pressure may drive them to rely on artificial intelligence (AI) applications as a coping mechanism to manage complex tasks and to compensate for perceived gaps in

their academic self-efficacy during this transformative period.

The sample is almost evenly split, but there are a few more men than women (53.4%). Additionally, this research found that the highest percentage of students, 90.3%, were unmarried. This finding is similar to a study conducted in Zimbabwe by [Revesai \(2025\)](#), which indicated that the majority of participants were male students (54.0%). A distinct investigation, juxtaposing the results of this research conducted in the Philippines by [Dumanjug et al. \(2024\)](#), indicated that 80.4% of the participants were female. The researcher noted that the increasing percentage of unmarried males in the current study is attributable to the characteristics of participants at the University of Diyala, where unmarried male students exhibit a greater inclination toward the use of modern technologies, including artificial intelligence. This tendency occurs because unmarried male students have greater access to current technologies. In contrast, married students face significant familial responsibilities that limit their time for study and for using these technologies.

Regarding perceived monthly income, most students report a moderate level (79.5%). This finding is similar to a study conducted in Pakistan (2021), which indicated that the vast majority of participants were vocational college students, with the largest proportion of the sample concentrated on the average monthly income (44.7%) ([Serdaneh & Qutami, 2025](#)). The researcher explains that the middle-income group is the most keen on social and academic progress, as its members see artificial intelligence applications as a means of independence and empowerment, giving them a competitive advantage at no additional financial cost.

This interpretation is consistent with recent evidence highlighting the growing dependence on generative artificial intelligence among university students and its impact on academic performance ([Revesai, 2025](#)). Accordingly, the researcher believes that the stability of income at this motivational level has transformed artificial intelligence from a mere technology into a fundamental partner that supports their self-efficacy in the face of the challenges and requirements of the study.

The academic grade shows that the highest percentage of students is in the second academic year (36.1%). This result is consistent with a study conducted in Zimbabwe in 2025, which indicated that second-year

students had the highest percentage of reliance on artificial intelligence, at 26.2%, compared with other academic year levels ([Revesai, 2025](#)). In contrast to the findings of the present study, a 2025 study conducted in China found that third-year students had the highest dependence on artificial intelligence, at 37.42%, compared with other academic levels ([Miao et al., 2025](#)). The researcher indicates that the elevated proportion of second-stage students signifies their engagement in more challenging and intricate academic activities compared with previous stages. Yet, their academic maturity and independent learning skills remain underdeveloped. This phase signifies a notable transition, as rising academic challenges and demands compel students to rely excessively on artificial intelligence tools to enhance their academic performance.

Regarding academic specialty, nearly half of the sample belongs to humanistic disciplines (48.9%). This result is consistent with a 2024 study conducted in China, in which students in humanities specialties accounted for the largest share of the sample, at 38.0% ([Jia et al., 2025](#)). In contrast to the current study, a 2025 study conducted in the United Kingdom reported that participants were predominantly from scientific disciplines (73.6%) ([Alghamdi, 2025](#)). The researcher explains that the representation of the largest percentage of students from human disciplines in the sample reflects the importance of this group in adopting academic behavior, as well as its prominent role in using cognitive tools within the university environment.

The present study shows that more than half of university students (56.6%) demonstrate low dependency on AI. The results of this study are consistent with previous research conducted on programming science students in the Philippines in 2025, which recorded a relatively low level of reliance on artificial intelligence tools. The authors explained this low dependence by citing factors including limited technological infrastructure and insufficient exposure to smart tools and technologies ([Hernandez et al., 2025](#)).

The findings of this study align with another study conducted among 872 university students in the Philippines in 2025, which found that students show a trend toward limited or moderate use of artificial intelligence techniques. This study reported that 62% of students had limited dependence on these tools.

Students were aware of the technical and academic benefits of AI tools. Still, they exercised caution about fully relying on AI for academic purposes or for psychological and social support, preferring traditional resources and direct human interaction instead. These ratios revealed that most students use these tools in a limited or moderate way rather than extensively (Hernandez et al., 2025). In 2025, researchers conducted another study among university students in the United States of America, which contradicts the results of the current study. The results showed that students rely on artificial intelligence tools to varying degrees, categorized into three levels: low dependence, appropriate dependence, and high dependence.

The study indicated that a large proportion of students were overly dependent on these tools, accepting AI outputs without critical review, resulting in inaccurate solutions and a decline in the quality of education (Pitts et al., 2025). The researcher explained that the findings of the present study, which revealed a significant decrease in students' dependence on artificial intelligence at Iraqi universities, contradict many initial studies that indicated the risks of increasing digital dependence. Contextual factors within the local educational environment may account for this discrepancy. The arithmetic mean was classified as low.

The finding shows that more than half of university students (54.5%) perceive moderate academic self-efficacy. The results of the current study are consistent with those of Serdaneh & Qutami (2025), who conducted a study in Jordan on a sample of students at the University of Jordan and showed that students' academic self-efficacy was average. This study focused on students' ability to organize and enhance their skills to achieve academic goals and overcome academic challenges in the educational environment. The results of the current study reinforce a 2025 study conducted in Turkey on a sample of university students, which confirmed that academic self-efficacy is a key factor in ranking students' academic performance and in the guidance and skill in using digital educational tools. The results of that study showed that students exhibit a high level of academic self-efficacy, which affects their ability to self-regulate their learning and use educational tools effectively (Akçay, 2025).

The findings of the current research differ from a study conducted in China (Jia et al., 2025) and show that

excessive use of generative artificial intelligence systems can create a false sense of confidence among students. She revealed that an actual improvement in academic performance does not align with the high sense of efficiency among students but rather reflects an excessive technical dependence that creates a false sense of mastery, masking shortcomings in students' self-learning skills and self-cognitive investment. The researcher explained that the results obtained at the University of Diyala, which showed a high average level of academic self-efficacy, indicate a complex relationship among various personal, environmental, and academic factors. These factors include a supportive cultural environment that helps education and encourages students to take academic responsibility; social support from family and friends that increases students' confidence in their success; the motivation and self-discipline of the students; effective teaching that promotes positive interactions and gives ongoing feedback to improve academic performance; and the nature of the measurement tools used, which might favor positive self-efficacy results.

Compared to other studies, these studies showed low or different levels of self-efficacy, with a high percentage of low-competent students observed, and found that stress and procrastination played a clear role in the decline in self-efficacy levels. Academic studies show that self-efficacy results vary widely and are not consistent across the board; they are influenced by factors like the environment, social and academic support, the characteristics of the group being studied, and the tools used for measurement, which highlights that students at the University of Diyala have a higher self-efficacy compared to findings from other studies.

The results of this study indicate a significant negative correlation between dependence on artificial intelligence and academic perceived self-efficacy among university students. This data indicates that higher dependence on AI is associated with lower levels of academic self-efficacy. The findings of this study align with those of a study conducted in Peru (Estrada-Araoz et al., 2025), which found that as university students' academic self-efficacy increases, their use of artificial intelligence techniques decreases. In contrast to the findings of the present study, research in the United Arab Emirates (Anierobi et al., 2025) was conducted. Examined the influence of artificial intelligence techniques on the

academic self-efficacy of university students. The results showed a positive correlation: as the use of artificial intelligence techniques increases, the higher the levels of academic self-efficacy, which contributed to improving the educational performance of students.

The researcher explained that the negative relationship between reliance on artificial intelligence and academic self-efficacy is influenced by the demands of Iraqi universities, which are affected by various factors related to the educational environment and the local academic context. Given the significance of Iraqi universities, their high course density, an increase in academic assignments, and time constraints that hinder the development of self-learning skills and critical thinking within the classroom, students often resort to quick solutions to complete their homework. The lack of proper training on how to use artificial intelligence effectively in education, due to the absence of rules and guidance, causes some students to use these technologies as a substitute for their thinking instead of as a helpful tool for learning, which in turn decreases their participation in analyzing, drawing conclusions, and solving problems. Modern educational approaches sometimes prioritize results over the learning process, fostering a reliance on quick fixes that allow students to produce satisfactory outcomes without truly enhancing their academic competence. Additionally, students experience increasing psychological and academic pressures due to fear of failure and anxiety from exams and high performance requirements. These pressures lead them to rely on artificial intelligence techniques to relieve stress and avoid academic failure, ultimately diminishing their confidence in their abilities. The sum of these factors creates a false sense of efficiency that hides weaknesses in independent learning skills and cognitive effort management, which negatively affects students' academic self-efficacy.

Based on the findings of the current study, the researcher suggested the following recommendations: encouraging faculty members to guide students to use artificial intelligence application technologies as an auxiliary tool in academic scientific work, and not as a substitute for personal intellectual effort, while determining the limits of the academically acceptable use of these technologies. Emphasizes the need to support and enhance students' self-learning and academic scientific independence, thereby reducing

excessive dependence on artificial intelligence techniques and maintaining a high level of academic self-efficacy, and supporting educational and academic institutions in developing clear policies and standards that regulate the use of artificial intelligence applications in the academic scientific environment, ensuring commitment to scientific honesty and maintaining the efficiency of learning outcomes.

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Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Declaration of Helsinki, which provides guidelines for ethical research involving human participants. Ethical considerations in this study were that participation was entirely optional.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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Authors' Contributions

All authors equally contribute to this study.

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