

Behind the Screen: Examining the Relationship between Artificial Intelligence Dependency and Academic Procrastination among Undergraduate Students

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ABSTRACT

The relationship among undergraduate students' Artificial Intelligence (AI) dependency and academic procrastination is examined in this study. The cross-sectional survey design was used. The sample consisted of 300 undergraduate students (150 males and 150 females) attending colleges and University of Haripur. Purposive sampling technique was used to select the participants. The Generative Artificial Intelligence Dependency Scale (Goh, Hartanto, & Majeed, 2025) and the Tuckman Procrastination Scale (Tuckman, 1991) were used to measure AI dependency and academic procrastination, respectively. Pearson correlation analysis and an independent-samples t-test were performed to analyze the data. Results indicated there was no significant difference between the gender and dependency on AI in the undergraduate students. The results showed that there was a significant positive correlation between AI dependency and academic procrastination, suggesting that the higher the level of AI dependency, the more likely the students were to display procrastinatory behaviors. The results indicate that overusing AI tools could be linked to difficulties in academic task completion and potentially have a negative effect on academic self-regulation. The study concludes that it is essential to support the use of AI technologies in the context of higher education in responsible and balanced ways, while also keeping in mind the possible adverse academic impacts.

Keywords: Artificial Intelligence dependency, procrastination, undergraduate students, cross-sectional survey, correlation analysis.

INTRODUCTION

In recent time, Artificial Intelligence (AI) has played a significant role in the world of higher education. With the proliferation of AI applications, students are now accessing information, finishing academic tasks and interacting with the learning process in ways that were unimaginable years ago. Access to tools like ChatGPT, Grammarly, and other AI-powered writing tools allows for instant academic assistance, tailored guidance, and instant information, thereby facilitating learning and making it more efficient and accessible. While there are educational advantages, there are also concerns about the escalating reliance of students on AI technologies and how they might affect their ability to think for themselves and regulate their learning.

Artificial Intelligence dependency is when individuals use AI tools too heavily, lacking in relying on their own cognitive abilities and problem-solving skills. Students will be more likely to

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rely on AI-generated answers for completing assignments and solving academic tasks instead of actively processing the information and forming their own understanding. While AI can be beneficial for improving productivity and learning efficiency, over-reliance can diminish students' critical thinking abilities, their capacity to absorb in-depth course material, and the acquisition of crucial academic skills. As a result, students might begin to depend excessively on AI, potentially affecting their learning styles and performance over time.

Procrastination can be a sign of overreliance on AI, one of the academic behaviors. Procrastination is the deliberate postponement of planned activities even when there will be negative outcomes. It is a very common problem among the university students and has always been associated with poor academic performance, high stress, poor time management and low self-regulation. The easy access and readiness of AI tools can lead to a sense of laziness among students, as they may think that assignments can be done in a matter of minutes using AI. There might be a tendency among students to procrastinate and delay academic tasks because of the ease and readiness of accessing AI tools, especially when they believe that tasks can be completed within a few minutes with AI help. This dependence can lead to coursework delays, inconsistent study habits and increased reliance on AI, particularly towards assignment deadlines.

While AI tools are quickly being introduced in higher education, studies on the psychological and behavioral impact of AI are still in their infancy. Specifically, there has been a lack of studies focusing on the influence of AI dependency on academic procrastination among undergraduate students, particularly in Pakistan. Thus, the present study is designed to explore the association between the use of Artificial Intelligence and academic procrastination among undergraduate students. This connection can offer valuable insight into the academic implications of over-dependence on AI and help shape the creation of policies and practices that encourage responsible, sustainable and effective use of AI technologies in higher education.

LITERATURE REVIEW

There have been a few recent studies that have looked into the acceptance and frequent use of different Artificial Intelligence (AI) tools among university students in academic environment. Galindo-Domínguez et al. (2025) employed a quantitative research design with 368 university students at the University of Málaga to examine their attitudes towards using ChatGPT for academic work. The results showed that ChatGPT was well accepted by students. Gender differences were not a significant factor in students' plans for using AI technology, indicating that all students had a positive attitude toward ChatGPT as an academic support tool.

The adoption of AI technologies has also sparked a concern about the growing reliance of students on these technologies. This study employed a quantitative cross sectional design to explore the relationship between AI dependency, learning outcomes and academic behaviour of university students in 2025, as studied by Mukhtar et al. (2025). The results mentioned that there was a significant positive correlation between using AI and academic procrastination. The more students used AI tools, the more likely they were to postpone academic tasks and to not complete their academic obligations.

In a like manner, Uppal and Hajian (2025) investigated students' attitude towards ChatGPT and ChatGPT users, along with the relationship between students' life attitudes, procrastination, and academic achievement. Their findings indicated that while using AI tools helped boost

students' confidence and their academic performance, overreliance on ChatGPT had a negative correlation with academic integrity and increased procrastination. The research noted that excessive reliance on AI-generated content could make it more tempting for students to put off academic tasks.

Morales-García et al. (2024) also used a quantitative cross-sectional design to explore the association of being dependent on artificial intelligence with procrastination among university students. AI dependency emerged as a key factor of procrastination in the study. The students who relied more heavily on AI were more likely to fail to complete assignments timely, self-regulated learning was less, and the students were not more actively engaged in the learning process.

In the literature, the educational benefits of AI are also recognized. Rani et al. (2023) studied how AI technologies can alleviate academic pressure in higher education students. Their findings indicated that AI tools provide rapid academic assistance, facilitate access to information, and enhance the overall learning experience. The authors noted, however, that the adoption of AI tools could lead to a greater dependence on the technology by students over time.

Similarly, Zhu et al. (2023) talked about the opportunities and challenges of AI in education. Their research found that AI could enhance the learning experiences by offering instant academic assistance and customization. However, overreliance on AI can lead to a decline in students' independent learning, critical thinking, and the ability to learn and solve problems on their own.

The subject of procrastination has been studied in depth in the field of educational psychology. Steel (2007) defined procrastination as the deliberate postponement of an action that one intends to do, even when he/she expects something bad to happen. His thorough review showed the negative correlations between procrastination and motivation and self-regulation and the negative impact of procrastination on academic performance. The results showed that students with less self-regulatory skills tend to be more prone to delay academic work, which leads to low educational achievement.

Overall, the findings suggest that while AI technologies can have significant educational value by making information more accessible, offering academic support, and boosting learning efficiency, overreliance on these tools can have a negative impact on independent learning, self-regulation, and intrinsic motivation. All this can eventually lead to a rise in school procrastination. While there is some emerging evidence that a relationship exists between AI dependency and procrastination, empirical studies that examine this association are limited, especially in developing countries.

Additionally, there is a lack of research that particularly considers undergraduate students learning in smaller cities or semi-urban educational institutions. In the Pakistani context, the rapid uptake of AI tools in higher education institutions has been under-researched, and this is especially true of the impact on women students. Hence, the current study proposes to look at the relationship between the dependency on Artificial Intelligence with academic procrastination among the students of undergraduate level at Haripur, Pakistan. The conclusions will help clarify the potential impact of over-reliance on AI technologies on students' academic actions and self-regulation practices in higher education institutions.

Objectives

1. To measure the level of Artificial Intelligence dependency among undergraduate male and female students.
2. To assess the relationship between AI dependency, procrastination, among undergraduate students.

Hypotheses

H1: There will be no significant difference in AI dependency between male and female undergraduate students.

H2: AI dependency will be positively associated with procrastination among undergraduate students.

RESEARCH METHODOLOGY

A cross-sectional correlational research design was adopted to study the artificial intelligence dependency and procrastination among undergraduate students. A purposive sampling technique was applied to select participants who fulfilling the study criteria and willingly consenting to take part in the study.

Sample

The sample comprised of 300 undergraduate students (150 males and 150 females) between 18 to 25 years of age. Participants were drawn from colleges and universities of Haripur.

Inclusion Criteria

Participants included male and female undergraduate students aged 18–25 years possessing experience in the use of artificial intelligence tools (e.g., ChatGPT and other AI-based applications) for academic purposes.

Exclusion Criteria

Students studying on a postgraduate or diploma course, students who are younger than 18, rather, they are older than 25 years, and have had no prior experience using AI tools to assist with academic work. The study was conducted with only those willing to participate, and excluded those who were not.

Instruments

1. Demographic Information

In demographics data was about participants' age, gender, and year of study.

2. Generative AI Dependency Scale (Goh, Hartanto, & Majeed (2025))

This is an 11-item tool to evaluate cognitive, emotional and behavioral dependence on generative AI systems. Answers on the items are scored on a 5-point Likert scale from 1 (Strongly Disagree) to 5 (Strongly Agree). Subscale scores are averaged to get a total dependency score with

higher scores indicating greater AI dependency. The scale exhibited excellent reliability ($\alpha = .92-.93$).

3. Tuckman Procrastination Scale (Tuckman, 1991)

This is a 15 item instrument to assess persons' tendency to delay academic work. Responses on the items are based on a 1-5 Likert scale, with 1 indicating Never happens to me and 5 indicating All the time happens to me. The scores of the relevant items are reversed and then added together with the scores of the other items, with higher scores signifying more procrastination. The scale showed good reliability ($\alpha = .89$).

Procedure

In the beginning approval for the research topic was obtained and permission to conduct the study was granted by the Department of Psychology. An official authorization letter was issued to verify the researcher's academic affiliation and to confirm that the study was being conducted in partial fulfillment of Bachelor of Science degree in Psychology.

After obtaining permission from the respective educational institutions, the researcher visited the selected institutions and established rapport with the participants by introducing herself and explaining the purpose and significance of the research study. Students were informed that their participation was entirely voluntary and they could withdraw from the study at any stage. Confidentiality and anonymity of the information provided were assured before the administration of the questionnaires.

Informed consents were obtained and standardized instructions were given to all participants regarding how to complete the questionnaires. The research instruments were administered in a classroom setting under the researcher's supervision to ensure uniformity in the administration process and to address any queries related to the instructions without influencing participants' responses. Participants completed the questionnaires individually, and the average time required to complete both instruments was approximately 15–20 minutes.

At the end participants were thanked for their cooperation and provided with a brief explanation of the purpose of the study. The completed questionnaires were carefully screened for completeness, coded, and entered into SPSS Version 27 for statistical analysis. Throughout the research process, participants' privacy, confidentiality, and ethical rights were strictly maintained.

RESULTS

Table 1

Demographic Characteristics of Students (N=300)

Characteristics of Variables	f	%
Gender		
Males	150	50%
Females	150	50%
Years of study		
First year	97	32.3

Characteristics of Variables	f	%
Second year	100	33.3
Third year	54	18
Fourth year	49	16.3

The demographic characteristics about participants in terms of are given in Table 1. gender and year of study were the two other factors considered. Sample comprised 300 undergraduate male and female students, with almost equal numbers of males (50%) and females (50%). In terms of year of study, the majority of participants studied in the 1st year ($n = 97$, 32.3%) and 2nd year ($n = 100$, 33.3%). The third-year students were 54 (18%) of the sample and fourth year students were 49 (16.3%). Overall, the distribution has a relatively even representation by academic year.

Table 2

Psychometric Properties for Scales (N=300)

Scales	N	M	SD	Range	Cronbach's α
GAI	11	30.91	8.69	11-106	.64
TPS	15	42.75	8.82	21-89	.72

Note. GAI = Generative Artificial Intelligence Dependency, TPS = Tuckman Procrastination Scale, N = Number of items, M = Mean, SD =Standard Deviation, α = Cronbach's Alpha

Table 2 summarizes the psychometric properties for the scales. The reliability analysis indicates that the Cronbach's α value for Generative Artificial Intelligence Scale is .64 ($<.80$) which shows satisfactory internal consistency. The Cronbach's α value for Tuckman Procrastination Scale is .72 ($<.80$) indicating good internal consistency.

Table 3

Mean, Standard Deviation and t-value of Males and Females on Generative Artificial Intelligence Scale

Variable	Male M	Male SD	Female M	Female SD	t	p	Cohen's d
GAI	2.83	0.71	2.78	0.86	0.46	0.647	0.05

Note: M = Mean, SD = Standard Deviation, p = level of significance, GAI = Generative Artificial Intelligence Dependency

The mean, standard deviation and t value for male and female participants in terms of Artificial Intelligence Dependency Scale are presented in Table 3 below. The results showed that there was no significant difference in AI depend N= Total no of sample, M = Mean, SD = Standard Deviation AI dependency scores between male and female undergraduate students. Female participants (M =2.79, SD = 0.86) reported slightly lower AI dependency scores than male participants (M = 2.83, SD = 0.72), $t(298) = 0.46$, $p = .647$. The effect size obtained was Cohen's d which was 0.05, indicating a very small effect size. The results indicate that gender has no statistically significant influence on the dependency of AI. Thus, the hypothesis that there is no significant difference between male and female students in dependency of artificial intelligence is supported.

Table 4

Variables	M	SD	1	2
1. Artificial Intelligence Dependency	2.81	.79	————	.703**
2. Procrastination	2.85	.58	.703**	————

Note: N= Total no of sample, M = Mean, SD = Standard Deviation

Table 4 shows the Pearson correlation between Artificial Intelligence Dependency and Procrastination among undergraduate students. The results indicated that there was a high positive and statistically significant relationship between Artificial Intelligence Dependency and Procrastination ($r = .703$, $p < .01$). This means that, if students use frequently the AI tools, they will be more likely to experience higher levels of procrastination. Procrastination was more likely to be reported by those who had greater dependency. Hence, the hypothesis was accepted and the correlation between Artificial Intelligence Dependency and Procrastination was found to be high and positive among the undergraduate students.

DISCUSSION

The main goal of the current study was to explore the association between the dependency on Artificial Intelligence (AI) and procrastination in academic tasks among undergraduate students. In addition, the current study aimed to investigate gender differences in AI dependency. Artificial Intelligence dependency means that students are overly depending on AI to complete their academic tasks, while academic procrastination is when they intentionally delay their work even after they know they need to do it. The Generative AI Dependency Scale (Goh et al., 2025), and the Tuckman Procrastination Scale (Tuckman, 1991) were used to assess the participants (undergraduate students). There were 300 participants ($N = 300$), of which 150 were male and 150 female. Pearson correlation analysis and an independent-samples t-test were used to as the most suited analysis.

The first hypothesis suggested that the level of dependency of undergraduate students with respect to Artificial Intelligence would not significantly differ between males and females. The independent-samples t-test revealed no significant difference between the mean AI dependency score of males and females students. Thus, the null hypothesis was accepted. The results align with those found by Galindo-Domínguez et al. (2025) who found no significant difference in students' intention to use ChatGPT in higher education between genders. The results indicate that there are comparable trends of using AI and dependence on the AI use among male and female students, which may be due to similar access to technological resources and similar academic requirements.

The second hypothesis suggested that there was a significant positive correlation between Artificial Intelligence Dependency and academic procrastination among the undergraduate students. Based on the results showed a Pearson correlation analysis, the academic procrastination with the level of AI dependency was found to be a strong and positive correlation with statistical significance. Thus, the hypothesis was supported. The results suggest that students who rely more on AI are more prone to procrastinatory activities. The findings align with those of Mukhtar et al. (2025) that found a positive association between the use of AI and procrastination among university students. Likewise, Morales-García et al. (2024) identified excessive reliance on AI technologies as being an important predictor of procrastination. Similarly, Uppal and Hajian

(2025) noted that students with strong usage of ChatGPT exhibited greater academic procrastination.

The overall result of this study shows that there is a significant positive relationship between the academic procrastination and AI dependency of undergraduate students, and no significant gender difference was found in AI dependency.

The results underscore the need to foster responsible and ethical practices with AI tools in higher education. Practicing the use of AI tools as a learning tool and not a replacement for independent learning can help to bring down the over-reliance and minimize the risks of students accepting AI-generated content as the final answer. Encouraging students to use AI as a learning tool and not as a replacement for independent thinking can help to bring down the over-reliance and minimize the risks of students accepting AI generated content as the final answer.

Limitations

1. The results in the study (N = 300) might not be widely applicable.
2. Purposive sampling technique was used hence the findings may not be generalized to the total population of the students.
3. The results were restricted to other region since data were collected from colleges and universities only in Haripur.
4. This study has employed a self-report method that can have a social desirability bias and a response bias.

Recommendations

1. Additional and more diverse samples of educational institutions and regions should be used in the future.
2. More representative findings should be obtained by using probability sampling techniques.
3. For understanding the relationship of the dependence of AI and procrastination over the year, researchers can use longitudinal research design and experimental research design.
4. Future studies need to consider other psychological and academic correlates of AI dependency and procrastination.

Implications

1. The outcomes can help in disseminating awareness among educational institutes of the usage of AI by students excessively in education.
2. Institutions of higher learning could create awareness programme to promote the responsible and balanced use of AI tools.
3. To decrease procrastination, facilitate self-regulation, time-management and independent learning skills.
4. The paper is one of the few research papers that help in understanding the problem of dependency on artificial intelligence and procrastination among undergraduates in Pakistan.

CONCLUSION

This study examined the relationship between Artificial Intelligence (AI) dependency and academic procrastination among the undergraduate students. The results showed that there were no significant differences between males and females in AI dependency, indicating that both groups reported similar levels of dependence on AI tools. In addition, a positive and statistically significant correlation was found between AI dependency and academic procrastination, indicating that the higher the level of AI dependency, the higher the level of academic procrastination. In summary, the results indicate that while AI can offer significant academic assistance, there is potential for over-reliance on these technologies that could lead to higher rates of procrastination among students. Therefore, educational institutions should promote the responsible and balanced use of AI tools to foster effective learning, independent thinking, and greater academic engagement.

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