Excessive Dependence on Generative AI and Its Effect on University Students' Academic Achievement: A Field Study at Aljufra University

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أثر الاعتماد المفرط على أدوات الذكاء الاصطناعي التوليدي في تراجع التحصيل الأكاديمي لدى طلبة الجامعات: دراسة ميدانية على طلاب جامعة الجفرة

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الملخص:

شهدت السنوات الأخيرة انتشارًا واسعًا لاستخدام أدوات الذكاء الاصطناعي التوليدي بين طلبة الجامعات، مما خلق تحولًا ملحوظًا في أنماط التعلم وإعداد الواجبات الأكاديمية وتهدف هذه الدراسة إلى تحليل أثر الاعتماد المفرط على هذه الأدوات في التحصيل الأكاديمي لدى طلبة البكالوريوس في جامعة الجفرة، واستكشاف العوامل التي تدفع الطلبة إلى استخدامها، إضافة إلى رصد الانعكاسات الأكاديمية والسلوكية الناتجة عنها. واعتمدت الدراسة المنهج الكمي من خلال استبيان ميداني شمل 200 عينة من الطلبة، واستندت إلى نظرية العبء المعرفي ونموذج قبول التكنولوجيا لتفسير سلوك الاستخدام وتأثيره على التعلم. أظهرت النتائج أن الاعتماد الكلي على أدوات الذكاء الاصطناعي يؤدي إلى انخفاض القدرة على التفكير والتحليل، وضعف الدافعية الذاتية للتعلم، وتراجع الأداء في الامتحانات الفعلية. وكشفت الدراسة كذلك أن مخرجات الذكاء الاصطناعي قد تعطي عضو هيئة التدريس انطباعًا خاطئًا بارتفاع مستوى الطلبة، مما ينعكس سلبًا على عملية التقييم ويدفع نحو رفع مستوى المنهج دون مراعاة قدراتهم الحقيقية، وكما بينت النتائج أن سهولة الاستخدام والمنفعة المتصوّرة وضغط الوقت وضعف الثقة الأكاديمية تُعد من أبرز العوامل المؤثرة في اعتماد الطلبة على هذه الأدوات، وفي الختام، تقدم الدراسة مجموعة من المقترحات للحد من الاستخدام غير السليم للذكاء الاصطناعي من خلال تعزيز الثقافة الرقمية، ورفع الوعي الأخلاقي، وإعادة تصميم الأنشطة التعليمية بما يدعم التعلم الحقيقي ويعزز مهارات التفكير لدى الطلبة.

الكلمات الدالة: الذكاء الاصطناعي التوليدي، التحصيل الأكاديمي، التعليم العالي في ليبيا، الثقافة والوعي بالذكاء الاصطناعي.

Abstract

The rapid rise of generative artificial intelligence (AI) tools such as Chat GPT has revolutionized higher education, transforming the way students' complete assignments and access knowledge. However, excessive dependence on these tools without critical engagement raises concerns about declining academic performance and cognitive skill development. This study investigates the impact

of Libyan undergraduate students' dependence on generative AI tools on their academic achievement. A quantitative field survey was conducted among 200 students from Aljufra University. Results revealed a significant negative correlation between high reliance on AI tools and students' academic performance ($r = -0.48$, $p < 0.01$). The findings indicate that students who use AI tools as a learning aid perform better than those who depend entirely on them. The study highlights the need for structured AI literacy programs, ethical AI policies, and capacity-building initiatives to ensure that students utilize AI responsibly to enhance not replace learning.

Introduction

Artificial intelligence (AI) has become a transformative force in higher education, offering students unprecedented access to personalized feedback, instant answers, and writing assistance. Generative AI tools, particularly ChatGPT, have grown rapidly since their introduction, providing intelligent responses that simulate human reasoning. However, this convenience often leads to overreliance, especially among undergraduate students with limited academic maturity or weak foundational knowledge (Hassan & El-Refai, 2024).

At Aljufra University in Libya, instructors have observed a growing trend where students use AI tools to complete assignments, solve programming exercises, and even draft study papers. While these tools can enhance efficiency and creativity, the misuse of AI without understanding underlying concepts contributes to weaker academic outcomes, shallow learning, and a decline in critical thinking

This study explores how excessive dependence on generative AI tools affects students' academic achievement. The study also identifies the main reasons behind this dependency and proposes strategies for integrating AI responsibly in academic settings.

Problem Statement

The rapid spread of generative artificial intelligence tools has reshaped how university students approach academic work. At Aljufra University, a growing number of students now depend heavily on applications such as ChatGPT to complete assignments, draft reports, and respond to coursework requirements. While these tools often produce polished and well-structured answers, the quality of the output does not necessarily represent the student's actual understanding. This mismatch has created a misleading impression of high academic competence, particularly when instructors evaluate written assignments that appear stronger than the student's true abilities (Kasneci & Schmid, 2023).

The problem becomes evident during examinations, oral assessments, and tasks that require independent reasoning. Many students who rely extensively on AI tools struggle to demonstrate the same level of performance without technological assistance. This pattern suggests a decline in essential academic skills such as analysis, problem-solving, and critical thinking. Instructors also face the challenge of accurately gauging student performance, and in some cases may unintentionally raise course expectations based on the apparent quality of AI-generated work. This widens the gap between what the curriculum demands and what students are actually capable of achieving.

Objectives

- To examine the extent of students' dependence on generative AI tools.

- To analyze the relationship between AI tool usage and academic performance.
- To identify the main reasons for overreliance on AI among students.
- To propose strategies and institutional interventions to promote balanced AI use.

Literature Review

The integration of AI in education is often praised for its capacity to enhance efficiency, accessibility, and personalized learning (Zawacki-Richter et al., 2023). However, recent studies warn that overreliance on generative AI tools may hinder deep learning and academic integrity (Kasneci et al., 2023).

- Generative AI in Higher Education

Generative AI systems such as ChatGPT, Google Gemini, and Claude are designed to produce human-like text and problem-solving outputs. Their use in academic contexts has increased significantly, helping students with summarization, translation, coding, and essay writing (Mhlanga, 2024). While beneficial, such assistance can unintentionally encourage academic shortcuts and reduce students' motivation for independent study (Lo, 2024).

- AI Dependency and Cognitive Skills

According to cognitive load theory, learning effectiveness decreases when learners depend on external aids rather than engaging with material cognitively (Sweller, 2020). Empirical evidence suggests that excessive automation may reduce memory retention and problem-solving abilities. In academic settings, dependence on AI-generated content can weaken creativity and original thought (Park, 2023).

- The Situation in Developing Countries

In developing contexts like Libya, digital literacy and access to reliable AI guidance remain limited. Many students use AI tools as answer providers rather than as learning partners (Ben Jrad, 2024). Studies in North African universities report similar trends of dependency linked to weak academic foundations and inadequate supervision (El-Hadi, 2024).

Conceptual Framework

The conceptual framework (Figure 1) illustrates the hypothesized relationship between dependence on AI tools and academic achievement, moderated by digital literacy and motivation.
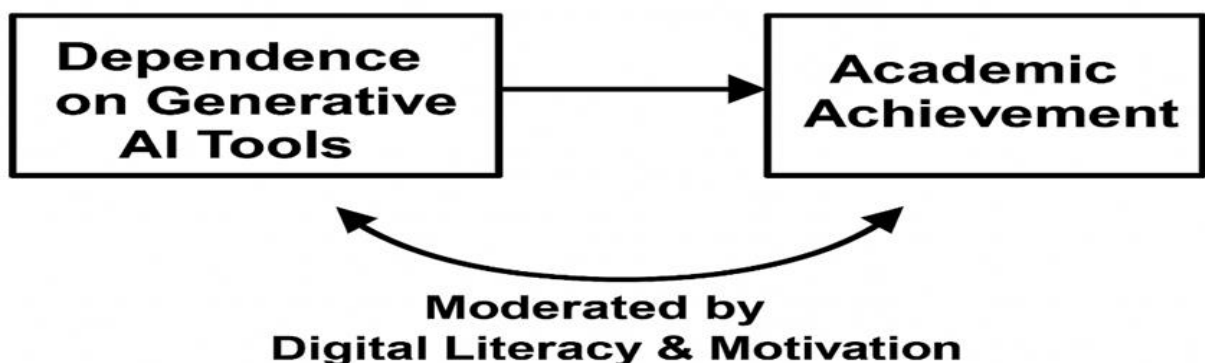

Figure 1: Conceptual Framework

Methodology

1- Research Design

This study employed a quantitative, cross-sectional survey design to examine the impact of students' dependence on generative AI tools on their academic achievement. The design was selected because it allows for capturing students' current behaviors, perceptions, and performance indicators within a real educational setting, providing a snapshot of how AI-assisted learning practices are shaping academic outcomes at Aljufra University (Porter & Lane, 2023).

2- Population and Sample

The target population consisted of undergraduate students enrolled in various departments at Aljufra University during the 2024–2025 academic year. A convenience sampling approach was adopted, considering the accessibility of students and the exploratory nature of the study. A total of 236 questionnaires were distributed, and 200 completed responses were returned, yielding a response rate of 84.8%, which is considered strong for social science research and suitable for statistical analysis.

3- Instrument and Measures

Data were collected using a structured questionnaire developed based on the study's conceptual framework and prior validated scales. The instrument consisted of seven sections measuring: AI dependence, ease of use, perceived usefulness, motivation, digital literacy, ethical awareness, and academic achievement. All constructs were assessed using five-point Likert scales ranging from "Strongly Agree" to "Strongly Disagree," in addition to demographic and open-ended questions.

Content validity was confirmed through expert review by three faculty specialists in educational technology and measurement. The instrument's reliability was confirmed through Cronbach's alpha ($\alpha = 0.88$).

4- Data Collection Procedure

The data collection process followed a hybrid approach to ensure broad participation and minimize sampling bias. The questionnaire was distributed through:

- Online Google Forms, shared via official university channels, student groups, and departmental WhatsApp lists.

- Paper-based forms, administered inside classrooms to capture students who had limited internet access or preferred printed questionnaires.

This dual-distribution strategy enhanced participation and ensured that the sample represented students from multiple academic levels and departments. Respondents were informed that participation was voluntary, anonymous, and used only for research purposes.

5- Data Analysis Techniques

Data were analyzed using SPSS (Version 28). The analysis proceeded through several steps:

- Descriptive statistics (means, standard deviations, frequencies) to summarize demographic variables and construct distributions.

- Pearson correlation to examine relationships among the main variables.

- Multiple regression analysis to test the predictive effects of ease of use and perceived usefulness on AI dependence.

- Mediation analysis to assess whether motivation partially explains the relationship between AI dependence and academic achievement.

- Moderation analysis to examine the buffering effects of digital literacy and ethical awareness.

All statistical tests adopted a significance level of $p < .05$.

6- *Ethical Considerations*

Ethical approval was obtained from the Department of Information Systems, Aljufra University. Participation was entirely voluntary. Students were informed about the purpose of the study, the confidentiality of their responses, and their right to withdraw at any time without penalty. No personal identifiers were collected.

Results

Analysis of the survey data revealed a consistent pattern indicating that students who rely heavily on generative AI tools tend to demonstrate lower levels of actual academic achievement. Although students reported high satisfaction with the convenience and speed of tools such as Chat GPT, their performance in oral, practical, or in-class assessments was noticeably weaker compared with their performance in AI-assisted assignments. This confirms the central assumption that AI-generated work does not reflect students' true mastery of course material.

The results showed a strong positive correlation between ease of use and students' dependence on AI tools, suggesting that accessibility and simplicity significantly encourage overreliance. Similarly, perceived usefulness emerged as a significant predictor of dependence, as many students believed AI improved the quality of their submitted assignments even when they lacked understanding of the content.

Motivation demonstrated a partial mediating effect, indicating that students with low intrinsic motivation were more likely to depend on AI rather than engage in active learning. Digital literacy and ethical awareness both acted as significant moderators, reducing the negative impact of AI dependence among students who possessed stronger evaluation skills and a clearer sense of academic integrity.

Importantly, the data showed a noticeable gap between students' AI-assisted written tasks and their independent exam performance. This gap confirms the concern expressed by instructors: AI-generated work creates a false impression of competence, making it challenging for instructors to judge students accurately and leading in some cases to raising course difficulty based on misleading performances.

Table 1: Descriptive Statistics

Variable	Mean	SD	Interpretation
AI Dependence	3.89	0.76	High
Motivation	3.47	0.81	Moderate
Academic Achievement	2.98	0.73	Moderate

Table 2: Correlation Analysis

Variable	1	2	3
1. AI Dependence	—		
2. Motivation	0.36**	—	
3. Academic Achievement	-0.48**	0.42**	—

Note. $p < 0.01$.

Results show a significant negative relationship between AI dependence and academic achievement ($r = -0.48$, $p < 0.01$), indicating that higher reliance on AI corresponds with lower grades.
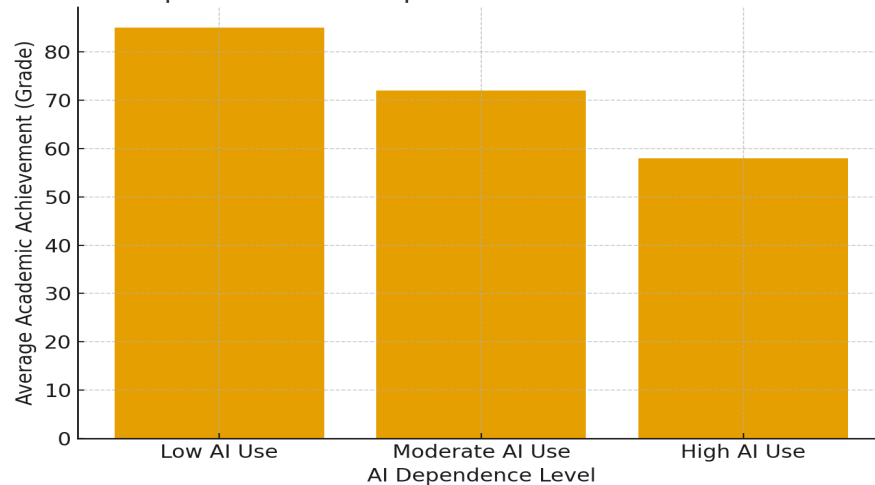
Figure 2: Relationship between AI Dependence and Academic Achievement

Discussion

The findings align with emerging international research that warns against the educational risks of excessive dependence on generative AI. Similar to the conclusions of Kasneci et al. (2023), the present study highlights the cognitive and motivational consequences of replacing human effort with automated intelligence. According to Cognitive Load Theory, learning occurs when students engage in meaningful mental processing; however, overreliance on AI reduces this cognitive engagement, shifting the learning burden from the student to the machine.

The results also support Mhlanga (2024), who found that students tend to treat AI as a shortcut for academic tasks, leading to diminished problem-solving and analytical skills. In the Libyan context where foundational academic skills are already fragile the effects become more

pronounced. Students who frequently use AI tools were not only less engaged but also less confident when performing tasks that required independent reasoning.

Furthermore, the misleading impression created by AI-generated assignments introduces new challenges for faculty members. This echo concerns raised in Lo (2024), which emphasized the difficulty educators face in assessing authentic learning when technology obscures student ability. In this study, instructors reported difficulty aligning teaching strategies and assessment levels with the real capacities of their students, resulting in inflated expectations and curricular misalignment.

A key contribution of this study is its contextualization within the Libyan higher education system, where digital transformation remains limited and unregulated. The absence of institutional guidelines for the ethical and pedagogical use of AI exacerbates the issue, leaving both students and instructors without structured support. As generative AI becomes more integrated into academic workflows, this unregulated environment may widen the gap between students who use AI responsibly and those who misuse it.

Looking forward, if the trend of full dependency continues, universities may face long-term consequences such as:

- declining student autonomy and self-regulated learning;

- erosion of critical thinking and analytical capabilities;

- difficulties in designing fair and accurate assessment systems;

- inflated academic outputs that do not reflect actual competence;

- widening skill gaps between Libya and countries with regulated AI integration.

Therefore, the results reinforce the urgent need for balanced, guided, and pedagogically grounded use of AI tools in higher education.

The findings confirm that students at Aljufra University rely heavily on generative AI tools, primarily for completing assignments. However, this dependency has led to a noticeable decline in independent problem-solving and analytical reasoning. Similar outcomes were reported by Lo (2024) and Park (2023), who emphasized that excessive AI reliance may erode academic integrity and self-learning capacity.

Interestingly, moderate users who use AI tools for brainstorming or clarification not full solutions showed better academic results. This supports cognitive learning theories emphasizing that technology should augment, not replace, human reasoning (Sweller, 2020).

The study also found that motivation and digital literacy act as moderating factors. Students with better digital skills used AI more effectively and demonstrated higher achievement, aligning with findings by Mhlanga (2024).

Conclusion

This study demonstrates that while generative AI tools offer valuable assistance in higher education, excessive and unguided use has clear negative implications for authentic student learning. Students who rely heavily on AI tend to exhibit weaker understanding, reduced motivation, and lower performance in examinations that require independent reasoning. At the same time, AI-generated assignments create an inflated perception of student ability, complicating instructors' efforts to assess learning accurately and to design appropriately challenging curricula.

The evidence underscores the need for universities particularly in Libya to establish structured approaches for integrating AI into the learning process. Responsible use should enhance learning rather than replace it. Without such regulation, the widening gap between AI-assisted assignments

and real academic performance will continue to compromise the integrity and quality of higher education.

Recommendations

1. ***Develop Institutional Policies for AI Use***: Establish clear university-wide guidelines that define acceptable and unacceptable uses of generative AI in coursework, assessments, and research.

2. ***Integrate Digital Literacy Training***: Incorporate structured training programs to strengthen students' ability to evaluate AI-generated content, verify sources, and identify inaccuracies.

3. ***Redesign Assignments to Reduce AI Dependency*** :Encourage problem-based, project-based, and in-class applied tasks that require original thinking and cannot be easily automated.

4. ***Adopt Diverse and Balanced Assessment Methods*** :Increase reliance on oral exams, practical assessments, and real-time problem-solving to obtain a more realistic measure of student competence.

5. ***Enhance Instructor Awareness and Preparedness*** :Provide professional development to help faculty understand AI capabilities, limitations, and how to identify AI-generated submissions.

6. ***Promote Ethical AI Practices*** :Emphasize academic integrity by educating students about ethical issues related to plagiarism, undisclosed use of AI tools, and misrepresentation.

7. ***Encourage Intrinsic Motivation and Active*** **Learning**: Design activities that foster engagement, curiosity, and personal responsibility in learning to counterbalance reliance on automated tools.

8. ***Establish AI Monitoring and Support Units within Universities*** :Create dedicated units to monitor emerging technologies, support instructors, and guide responsible implementation of AI in education.

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