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Generative AI Adoption and its Influence on Self-Regulated Learning and Academic Practices

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Abstract

The rapid advancement of Generative Artificial Intelligence (GenAI) is transforming the landscape of higher education by reshaping how students access, process, and produce knowledge. This study examines the impact of GenAI tools on self-directed learning (SDL) among higher education students, with a focus on learner autonomy, critical thinking, and academic practices. Adopting a qualitative approach based on secondary data, the study reviews recent literature to analyze patterns of student interaction with AI-powered tools such as ChatGPT and similar platforms.

The findings indicate that GenAI enhances learning by providing instant feedback, personalized support, and improved accessibility, thereby fostering independent learning. However, the study also identifies significant concerns, including over-reliance on AI, reduced cognitive engagement, risks to academic integrity, and challenges in evaluating the credibility of AI-generated content. The results highlight a dual impact, where GenAI acts both as an enabler and a potential disruptor of self-directed learning.

The study concludes that while GenAI holds strong potential to support SDL, its effectiveness depends on responsible usage, critical evaluation skills, and institutional frameworks. It emphasizes the need for AI literacy, clear academic policies, and redesigned pedagogical strategies to ensure that AI integration enhances rather than undermines independent learning.

INTRODUCTION

Artificial Intelligence (AI) refers to computer-based systems capable of performing tasks that typically require human intelligence, such as language processing, decision-making, and creativity (Chan & Colloton, 2024). A rapidly growing subset, Generative AI (GenAI), goes beyond analysis by creating new content, including text, images, audio, and code, using advanced techniques like deep learning and natural language processing. Tools such as ChatGPT, Bard, DALL-E, and GitHub Copilot are increasingly being integrated into educational environments.

In higher education, GenAI is transforming how students access, engage with, and produce knowledge. It offers real-time, personalized support, enabling learners to generate ideas, summarize content, and receive instant feedback. This has the potential to enhance accessibility and support diverse learning needs, particularly for students in underserved contexts.

However, alongside these benefits, concerns have emerged regarding its impact on self-directed learning (SDL)—a critical skill that involves independent goal-setting, resource management, and reflective learning. The ease of accessing AI-generated content may lead to over-reliance, reduced critical thinking, and superficial understanding.

Given the growing adoption of GenAI, it is essential to evaluate its influence on students' ability to learn independently. This study examines how GenAI affects self-directed learning, focusing on student usage patterns, perceptions, and its implications for critical thinking and academic integrity.

SIGNIFICANCE OF THE STUDY

The significance of evaluating generative AI's impact on self-directed learning

It addresses key concerns and opportunities related to the integration of GenAI in self-directed learning, offering insights relevant to students, educators, and policymakers.

GenAI-powered tools have the ability to provide personalized recommendations, instant feedback, and tailored learning pathways, which can significantly enhance students' self-directed learning experiences (Roe & Perkins, 2024).

While AI tools can provide significant learning support, concerns about academic integrity, misinformation, and plagiarism remain. Many institutions are struggling to define clear policies on how AI should be integrated into learning and assessments (Chan & Colloton, 2024). This study will contribute to establishing practices for AI integration in self-directed learning environments.

Educational institutions worldwide are adapting their teaching and assessment methods to accommodate AI's growing presence. Some universities have chosen to restrict AI use, while others aim to integrate it responsibly into curricula (Abdullahi et al., 2025). This research will provide evidence-based recommendations to help institutions develop AI policies that balance academic integrity and innovation.

OBJECTIVES OF THE STUDY

- To identify the key factors influencing self-directed learning (SDL) abilities among students using Generative AI tools.

- To analyze the impact of AI-powered tools on self-directed learning—whether they support or weaken students' learning abilities.
- To understand how students evaluate the credibility and accuracy of AI-generated content.
- To examine the balance between AI-driven learning support and the risk of over-dependence on AI tools.
- To provide recommendations for integrating Generative AI tools in a way that enhances self-directed learning without diminishing critical thinking and autonomy.

REVIEW OF LITERATURE

1. How GenAI Affects Self-Directed Learning

Self-directed learning (SDL) is an important part of higher education, where students take responsibility for their own learning, set goals, and monitor their progress (Garrison, 1997). Many students now use GenAI tools like ChatGPT to find information, get feedback, summarize complex ideas, and even generate content without much help from teachers. According to Roe and Perkins (2024), AI can improve SDL by providing instant and personalized support, allowing students to learn at their own pace and explore a wide range of knowledge sources. However, the study also points out that AI cannot replace teachers, as students still need guidance in thinking critically and using AI responsibly.

The research identifies four main points:

1. GenAI can help students become better at self-learning.
2. Teachers still play an important role in guiding students when they use AI.
3. AI can personalize learning experiences by adapting to students' needs.
4. Relying too much on AI can lead to problems like misinformation and surface-level learning.

Similarly, Freeman (2024) conducted a survey of 1,250 college students and found that 53% use AI for academic tasks like summarizing content, finding information, and solving problems. Many students reported that AI made learning easier and more engaging, but there were also concerns about AI's accuracy, bias, and the risk of students losing critical thinking skills. This shows that while AI can support SDL, students need to question and evaluate the content AI provides.

2. AI's Impact on Thinking and Learning Skills

One big debate about GenAI is whether it helps or harms students' ability to think critically and solve problems. Chan and Colloton (2024) argue that AI can make learning faster, but it might also encourage students to accept information passively instead of thinking deeply about it. Their study suggests that students should be taught how to check AI-generated content, compare different viewpoints, and engage in problem-solving rather than just taking AI answers at face value.

On the other hand, Abdullahi et al. (2025) studied how AI is used in academic research and found that while AI helps students find information quickly, it may weaken their ability to conduct independent research. Students may become too dependent on AI-generated summaries and

insights instead of doing their own analysis and critical thinking. The researchers suggest that colleges should create learning programs that combine AI support with traditional research skills to ensure students maintain their ability to think independently.

Similarly, Khlaif et al. (2024) surveyed 358 college faculty members and found that many professors worry about the negative effects of AI on students' writing, originality, and thinking abilities. While AI can reduce teachers' workload and provide quick feedback, some professors fear that students might skip important thinking processes and rely too much on AI-generated answers. To solve this problem, universities should offer structured AI training programs to help students use AI wisely while developing their critical thinking and ethical decision-making skills.

3. The Digital Divide: Unequal Access to AI

AI has the potential to make education more accessible, but research shows that not all students have equal access to AI tools. Freeman (2024) found that students from wealthier backgrounds have more opportunities to use AI, while those from lower-income communities struggle due to a lack of technology and AI training. This raises concerns that AI may widen educational inequalities instead of making learning fair for everyone.

Kurtz et al. (2024) argue that AI in education should help reduce, not increase, learning gaps. They suggest universities take the following steps:

- Provide free or low-cost AI tools for students who cannot afford them.
- Offer AI literacy programs for students at different skill levels.
- Train teachers so they can help students use AI effectively in learning.

Without these measures, AI may benefit only a small group of students while leaving others behind.

4. The Role of Teachers in AI-Assisted Learning

While AI has changed the way students learn, it has also impacted teachers and how they design lessons and assessments. Khlaif et al. (2024) found that many teachers do not have enough training in using AI for teaching, which makes them hesitant to use AI-based tools. Professors raised concerns about:

- Whether AI might reduce the need for traditional classroom learning.
- The difficulty of detecting AI-generated work in student assignments.
- The ethical challenges of using AI in education.

To help teachers feel more confident in using AI, Kurtz et al. (2024) recommend a faculty development program where educators are trained on how to:

- Use AI in assessments.
- Create engaging learning experiences with AI.
- Teach students critical thinking skills when working with AI.

5. The Need for Clear AI Policies in Education

One major issue in AI adoption is that most universities do not have clear policies on AI use in education. Chan and

Colloton (2024) argue that many institutions have unclear or inconsistent rules, making it hard for students and teachers to know how AI should be used. Similarly, Khlaif et al. (2024) found that universities struggle to balance AI's benefits with concerns about academic honesty.

To address these issues, researchers suggest:

- Creating clear AI policies that define how students can use AI tools ethically.
- Adding AI literacy courses to university programs so students learn how to use AI responsibly.
- Updating assessments to ensure students still engage in original thinking and research, even with AI assistance.

Some key scholars are leading the conversation on how generative AI tools affect learning. Chan, C.K.Y. and Rudolph, J. have published the most, with about six works each. Other important contributors include Shahzad, M.F., Tan, S., and Xu, S., who each have four to five publications. This small but influential group shapes discussions on learning processes, instructional design, and student engagement.

While research is growing worldwide, a few countries and authors currently lead the scholarly conversation.

RESEARCH GAPS

Despite the increasing integration of GenAI in higher education, research on its direct impact on self-directed learning remains scarce. Several gaps in existing literature justify the need for this study:

1. Most existing studies focus on AI's role in content delivery and automation

→ Current research largely examines how AI simplifies tasks such as grading, content creation, or administrative functions, rather than how it transforms students' learning processes or fosters deeper engagement.

2. Few explore its impact on self-directed learning behaviors

→ There is limited investigation into how AI, particularly generative models, supports or alters students' ability to take initiative, set goals, and regulate their own learning pathways.

3. Limited research on how students interact with Generative AI tools like ChatGPT to manage their learning independently

→ We lack empirical data on how students are actually using tools like ChatGPT for things like problem-solving, revision, or personalized learning without instructor guidance.

4. Insufficient understanding of the cognitive and critical thinking impacts of using GenAI in academic settings

→ There is a knowledge gap regarding how generative AI affects students' reasoning abilities, depth of understanding, and development of higher-order thinking skills.

5. A gap exists in evaluating the balance between student autonomy and AI-dependence

→ It remains unclear whether students are becoming more autonomous learners or increasingly reliant on AI for thinking and decision-making, raising questions about long-term learning outcomes.

6. Lack of evidence-based strategies for responsible integration of GenAI to foster SDL without compromising academic integrity

→ Educators and institutions lack clear, research-backed guidelines on how to use generative AI in a way that supports self-directed learning (SDL) while maintaining ethical standards and preventing misuse.

RECOMMENDATIONS

Based on the findings of the study, the following recommendations are proposed:

1. Promote AI Literacy Among Students

Educational institutions should introduce AI literacy programs to help students understand how to use GenAI tools effectively, ethically, and critically. Students must be trained to evaluate AI-generated content rather than accepting it blindly.

2. Develop Clear Institutional Policies

Universities and colleges should establish well-defined guidelines regarding the use of AI in academics. Policies should address issues such as plagiarism, ethical usage, and acceptable levels of AI assistance in assignments and research.

3. Encourage Critical Thinking and Analytical Skills

Teaching strategies should be redesigned to emphasize problem-solving, critical evaluation, and independent thinking. Assignments should be structured in a way that requires students to reflect, analyze, and justify their responses beyond AI-generated outputs.

4. Integrate AI as a Support Tool, Not a Substitute

GenAI should be positioned as a supplementary learning aid rather than a replacement for student effort. Educators should guide students on how to use AI to enhance learning rather than bypass the learning process.

5. Faculty Training and Development

Institutions should conduct training programs for educators to help them integrate AI into teaching, design AI-resilient assessments, and guide students effectively in AI-assisted learning environments.

6. Ensure Equitable Access to AI Tools

Efforts should be made to reduce the digital divide by providing equal access to AI tools and resources for all students. This includes infrastructure support and affordable or institutional access to AI platforms.

7. Redesign Assessment Methods

Assessment systems should evolve to include more application-based, experiential, and viva-oriented evaluations to ensure originality and genuine understanding, minimizing over-reliance on AI-generated content.

8. Encourage Ethical Use and Academic Integrity

Institutions should foster a culture of honesty by educating students about ethical AI usage and the importance of originality in academic work.

CONCLUSION

The integration of Generative Artificial Intelligence (GenAI) in higher education has brought a transformative shift in the way students engage with learning. This study

highlights that GenAI tools significantly influence self-directed learning (SDL) by providing instant access to information, personalized support, and enhanced learning flexibility. Students increasingly rely on these tools for academic tasks such as content generation, summarization, and problem-solving, which can improve efficiency and accessibility in learning.

However, the findings from the literature also reveal a dual impact. While GenAI fosters autonomy, creativity, and independent exploration, it simultaneously raises concerns regarding over-dependence, reduced critical thinking, and superficial learning. The ease of obtaining ready-made responses may discourage deep cognitive engagement and weaken essential research and analytical skills.

Moreover, challenges related to academic integrity, misinformation, and unequal access to AI tools further complicate its role in education. The absence of clear institutional policies and limited AI literacy among both students and educators adds to the complexity of its effective integration.

Overall, GenAI acts as both an enabler and a disruptor of self-directed learning. Its true impact depends on how responsibly and strategically it is used. Therefore, a balanced approach is essential—one that leverages the benefits of AI while preserving the core principles of independent learning, critical thinking, and academic integrity.

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