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EXPLORING PSYCHOLOGICAL AND TECHNOLOGICAL DRIVERS OF STUDENT ABSENTEEISM IN THE ERA OF ARTIFICIAL INTELLIGENCE

Short Paper

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Abstract

Student absenteeism in higher education is a global challenge, increasingly influenced by emerging technologies and artificial intelligence. This study explores how psychological constructs, and technological factors interact to explain absenteeism. Integrating locus of control, self-efficacy, and digital displacement theories, we propose a research model to understand this phenomenon. Locus of control theory explains how beliefs about personal agency affect motivation and attendance, while self-efficacy theory highlights the role of mastery, vicarious experiences, and emotional states in shaping confidence for independent learning. Digital displacement theory examines how technological environments, including AI tools and online platforms, alter learning behaviors and reduce reliance on face-to-face interactions. This model provides a foundation for future research, where data collection through questionnaires and subsequent modeling may offer opportunities to derive actionable insights for addressing absenteeism in the context of technological advancements.

Keywords: Student absenteeism, Classroom technologies, Self-efficacy, Locus of control, Digital displacement.

1 Introduction

Student absenteeism in higher education has been a persistent challenge, impacting academic performance and institutional efficiency (Teixeira, 2016). Recently, there has been a notable rise in absenteeism rates (Kreitz-Sandberg & Fredriksson, 2023; Mervosh & Paris, 2024). While this trend is partly attributable to the recent pandemic, it may also have been exacerbated by the growing integration of technology in classrooms and the widespread use of artificial intelligence (AI) tools by students. Furthermore, AI tools, including chatbots, adaptive learning systems, and generative AI, are increasingly used by students for self-learning and to support the resolution of academic problems or projects (Consoli et al., 2024; Dahri et al., 2024). As a result, students increasingly perceive these technologies as fulfilling their academic needs, which we define as the set of resources and support required for knowledge acquisition, skill development, and academic success. For instance, students striving for high academic performance may perceive that seeking assistance from ChatGPT, rather than a teacher, is

sufficient to achieve their desired results. While these technologies offer significant educational benefits, they may also encourage disengagement from in-person classroom settings (Akar & Güzin, 2024).

The problem of student absenteeism has been extensively studied, with research highlighting its causes, consequences, and mitigation strategies. Factors such as socioeconomic status, academic motivation, and institutional policies have been widely explored (Keppens, 2023; Moores et al., 2019). However, the literature has largely overlooked the role of emerging technologies in recent years in influencing absenteeism. While studies on locus of control and self-efficacy have examined their impacts on student motivation and learning outcomes (Bartimote-Aufflick et al., 2016), these frameworks rarely account for how the technological environment mediates these relationships. Similarly, research on digital displacement focuses predominantly on workplace dynamics (Zacher & Rudolph, 2024) without addressing its implications in academic contexts. By integrating psychological constructs with the influence of technological factors, this study aims to fill a critical gap in the understanding of absenteeism. Specifically, we address the following research questions: (1) How do locus of control and self-efficacy interact with digital displacement to influence absenteeism? (2) What role does the technology in classrooms and the widespread use of AI tools play in student absenteeism?

In this study, we propose a theoretical model that combines three established theories—locus of control, self-efficacy, and digital displacement. Our model examines how internal and external locus of control, self-efficacy constructs (mastery experience, vicarious experience, emotional state, verbal persuasion, and self-efficacy for independent learning), and the technological environment interact to explain student absenteeism.

Our research model examines absenteeism from the perspective that is not solely a behavioural issue, but a multifaceted phenomenon influenced by psychological constructs and technological contexts (Keppens, 2023; Moores et al., 2019), a perspective that has received little empirical attention. While the individual constructs of locus of control and self-efficacy have been well-studied in educational contexts, their interaction with the concept of digital displacement in higher education is underexplored. In this regard, this research contributes to the literature in two ways: First, it extends the application of locus of control and self-efficacy theories by incorporating the concept of digital displacement in educational settings. Second, it provides a novel framework for understanding absenteeism, which can guide future research and inform institutional strategies for improving student engagement. This integrated approach addresses a gap in the literature by linking psychological theories with the role of AI-driven technologies in shaping attendance behaviour, offering new insights into how students navigate learning in digitally mediated environments.

2 The impact of disruptive and emerging technologies on student absenteeism

The integration of disruptive and emerging technologies in education has significantly transformed traditional learning environments, presenting both opportunities and challenges. Technologies such as online learning platforms, virtual classrooms, and adaptive learning systems have enhanced accessibility and flexibility in education. However, these innovations may inadvertently contribute to higher absenteeism rates. While past digital tools and online resources primarily served as a supplement for physical class attendance (Menendez Alvarez-Hevia et al., 2021; Moores et al., 2019), AI-driven technologies like ChatGPT fundamentally offers instant support and feedback, frequently exceeding the capabilities of human instructors (Crawford et al., 2024). This unprecedented level of accessibility, combined with the disruptions in education provided by COVID-19 crises, has accelerated absenteeism trends beyond prior digital learning models (Giray et al., 2024).

Among the emerging technologies that impacted the education sector, AI has been particularly disruptive, further transforming the academic landscape by providing tools for personalized learning and problem-solving. AI-powered platforms, including large language models like ChatGPT, allow students to access immediate support and guidance for academic tasks, improving learning efficiency (Guo & Wang, 2024). However, extensive reliance on these tools may reduce the incentive for attending classes, as students may perceive their academic needs as met independently of instructor-led sessions.

Furthermore, the phenomenon of digital displacement—where traditional teaching methods and face-to-face interactions are supplanted by technology-driven alternatives—can undermine the relational and collaborative aspects of learning. Research has emphasized that while AI-driven tools enhance access, their unregulated use may inadvertently promote disengagement and absenteeism (Lo et al., 2024). As these technologies continue to evolve, their dual impact on accessibility and engagement highlights the need for thoughtful implementation to maintain balanced attendance behaviours. Furthermore, Lo et al. (2024) noted that the extent to which AI tools like ChatGPT shape the student's habits remains unclear.

3 Theoretical model and hypotheses development

3.1 Locus of control theory

The locus of control theory (Rotter, 1966), part of the social learning theory, explains individual differences in the perception of control over life events. It consists of two primary components: internal locus of control and external locus of control. Individuals with an internal locus of control believe they can influence outcomes through their efforts and actions, attributing success or failure to their abilities. Conversely, individuals with an external locus of control attribute outcomes to external forces, such as luck, fate, or others' actions. This theory has been widely applied in educational psychology to explore student motivation and behaviour (Cahyadi et al., 2021). Higher education students with an internal locus of control may take more responsibility for their academic success, whereas those with an external locus may rely more on external factors and interventions.

Locus of control theory examines whether students attribute academic success to internal efforts or external factors, influencing their motivation to attend classes. Meanwhile, self-efficacy theory focusses on students' confidence in their ability to learn independently, particularly in AI-driven and digital learning environments. While both theories address perceived control, locus of control explains students' sense of responsibility for their academic outcomes, whereas self-efficacy reflects their belief in managing learning effectively on their own.

Class attendance and absenteeism can be understood through the lens of locus of control. Students with an internal locus of control are more likely to prioritize attending classes, as they associate their presence with academic achievement. They may view attendance as an active step in exercising control over their educational outcomes (Szabó-Morvai & Kiss, 2024). In contrast, students with an external locus of control might perceive their presence in class as less critical, attributing outcomes to instructors or circumstances beyond their control (Hollett et al., 2020).

Students with an internal locus of control are likely to have a higher sense of self-efficacy for independent learning because they attribute their successes to their efforts and competencies. By believing they have control over their learning, they develop confidence in their ability to manage academic tasks independently. Research shows that internal locus of control correlates positively with self-efficacy, as both constructs reinforce the perception of personal agency (İskender & Akin, 2010; Szabó-Morvai & Kiss, 2024). Consequently, we hypothesize that:

H1: The internal locus of control influences self-efficacy for independent learning positively.

An external locus of control may increase student absenteeism by diminishing the perceived importance of individual effort. Students who attribute academic outcomes to external factors, such as luck or institutional policies, may feel less compelled to attend classes regularly. This lack of responsibility and perceived control over their success can foster disengagement and higher absenteeism rates (Hollett et al., 2020; Ma et al., 2024). Consequently, we hypothesize that:

H2: The external locus of control influences student absenteeism positively.

Students with high self-efficacy for independent learning may exhibit higher levels of absenteeism. While these students are motivated and skilled in managing academic tasks independently, this very confidence may reduce their perceived need for face-to-face instruction. They may prioritize their own study methods or digital resources over classroom attendance, viewing classes as supplementary rather

than essential, potentially leading to reduced attendance (McClelland & Case, 2023; Moores et al., 2019). Therefore, we hypothesize that:

H3: Self-efficacy for independent learning influences student absenteeism positively.

3.2 Self-efficacy theory

The self-efficacy theory (Bandura, 1977) describes the belief in one's ability to execute actions required to achieve specific goals. Self-efficacy is a critical determinant of motivation, behavior, and performance. It comprises four main sources: mastery experiences, vicarious experiences, verbal persuasion, and emotional and physiological states. Mastery experiences, or successful task completion, are the strongest predictors of self-efficacy, as they build confidence through direct evidence of capability. Vicarious experiences involve observing others succeed, which can reinforce one's belief in their potential. Verbal persuasion refers to encouragement from others, which can bolster self-confidence, while emotional states, such as stress or anxiety, can influence self-perception positively or negatively (Bartimote-Aufflick et al., 2016).

In higher education, self-efficacy theory is particularly relevant for explaining class attendance. Students with high self-efficacy are more likely to engage in academic tasks, attend classes, and persist through challenges because they believe in their ability to succeed. Conversely, students with low self-efficacy may avoid attending classes or learning activities, fearing failure or underestimating their abilities (Bassi et al., 2007). These differences in attendance behaviors can be linked to the four sources of self-efficacy. For instance, a student who has repeatedly succeeded in class may feel confident and motivated to attend, while one who experiences anxiety or negative feedback may avoid participation.

Mastery experiences are a positive influence on self-efficacy for independent learning. Successfully completing academic tasks reinforces students' belief in their ability to manage similar challenges independently. For example, students who consistently achieve good results in self-directed learning are more likely to develop confidence in their capacity to succeed without extensive guidance. Nowadays, the students can rely on AI tools to achieve those good results, and therefore have a feeling of mastery (Wilson et al., 2020). Consequently, we hypothesize that:

H4: Mastery experience influences the self-efficacy for independent learning positively.

Vicarious experiences also positively influence self-efficacy for independent learning. Observing peers successfully navigate academic challenges with the use of AI technologies demonstrates that these tasks are achievable. For instance, when students see their classmates excelling in independent study methods, they may adopt similar strategies, enhancing their belief in their abilities. The impact is particularly pronounced when the observed individual shares similar characteristics or circumstances with the observer (Bautista, 2011; Wilde & Hsu, 2019). Therefore, we hypothesize that:

H5: Vicarious experience influences self-efficacy for independent learning positively.

Verbal persuasion positively influences self-efficacy for independent learning by boosting students' confidence through constructive feedback and encouragement. Supportive words from instructors, peers, or mentors can motivate students to approach tasks with a belief in their capability to succeed. Similarly, AI-driven tools such as intelligent tutoring systems and adaptive learning platforms can provide personalized, supportive feedback that motivates students to believe in their capabilities. For instance, an AI system highlighting a student's progress or mastery of specific concepts can foster a sense of competence, reinforcing their confidence in managing academic tasks independently, fostering a sense of competence, which in turn promotes higher self-efficacy (Barton & Dexter, 2020; Crawford et al., 2024; Usher & Pajares, 2008). Consequently, we hypothesize that:

H6: Verbal persuasion influences self-efficacy for independent learning positively.

Emotional states influence self-efficacy for independent learning, but the effect may be positive or negative depending on the emotional experience. Positive emotions, such as enthusiasm or excitement, can enhance self-efficacy by creating a sense of readiness and confidence. Interactions with AI tools can evoke positive emotions, which may shape students' confidence in their independent learning abilities. Conversely, negative emotions, such as anxiety or stress, can undermine self-efficacy, leading students

to doubt their abilities. For example, students who associate independent learning tasks with high stress may feel less confident, while those who approach such tasks with calm and optimism are likely to feel empowered (Barton & Dexter, 2020; Putwain et al., 2013). Therefore, we hypothesize that:

H7: Emotional state influences the self-efficacy for independent learning, with both positive and negative effects possible.

3.3 Digital displacement

Digital displacement theory explores how technological advancements can replace traditional human-mediated activities, reshaping behaviours and social interactions. The theory highlights the potential for digital tools to shift reliance from conventional practices to technology-driven alternatives. It includes three main components: the accessibility of digital tools, the perceived efficiency of technology compared to traditional methods, and the impact on human interaction and engagement. In education, this theory examines how technologies, such as online platforms and AI tools, may supplant face-to-face teaching and peer collaboration, leading to changes in student behaviour (Tokunaga, 2016).

In higher education context, digital displacement theory helps explain class attendance and absenteeism by highlighting the role of technology in altering learning preferences. A classroom rich in technology may reduce the need for physical attendance, as students perceive they can achieve equivalent or superior outcomes through online lectures, virtual discussions, or AI-driven tools. While these technologies offer benefits, such as flexibility and personalization, they can also weaken the value of in-person interactions and diminish the sense of classroom community. This shift may lead to increased absenteeism, as students opt for digital solutions over traditional attendance (Crawford et al., 2024).

The classroom technological environment may positively influence student absenteeism. Classrooms equipped with advanced technologies, such as recorded lectures, virtual learning platforms, or real-time online collaboration tools, provide students with alternative methods to access content. While this flexibility can support learning, it may reduce the perceived importance of attending classes in person. For instance, students might choose to engage with recorded sessions at their convenience rather than participating in live, synchronous learning, leading to higher absenteeism rates (Lu & Cutumisu, 2022; McClelland & Case, 2023). Consequently, we hypothesize that:

H8: The classroom technological environment influences student absenteeism positively.

The use of AI tools in academic environments may positively influence student absenteeism. Tools such as ChatGPT, adaptive learning platforms, or AI-driven tutoring systems provide immediate and tailored support for academic tasks. While these tools enhance efficiency and learning outcomes, their availability may reduce the perceived need for attending classes, as students feel they can meet their academic goals independently (McClelland & Case, 2023; Selwyn, 2022). For example, students relying on AI tools for assignments or study preparation may view class attendance as redundant, contributing to increased absenteeism. Therefore, we hypothesize that:

H9: The use of AI tools in academic environments influences student absenteeism positively.

Integrating locus of control theory, self-efficacy theory, and digital displacement theory into a single research model for student absenteeism (see Figure 1) represents a significant theoretical advancement. To date, few studies have examined how psychological constructs interact with the technological shifts driven by generative AI in higher educational. Locus of control theory offers insights into how students' beliefs about their ability to influence outcomes affect their motivation to attend classes. Self-efficacy theory adds depth by highlighting how confidence in independent learning capabilities shapes attendance behaviours, potentially mediating the impact of locus of control. Digital displacement theory complements these perspectives by addressing how technological environments and tools, such as AI, alter learning behaviours and reduce reliance on traditional classroom settings. This integrated model contributes a new understanding of absenteeism by moving beyond traditional behavioural and motivational explanations, incorporating both psychological traits and the influence of rapidly evolving educational technologies. As such, it addresses an important gap at the intersection of educational psychology and technology adoption research.

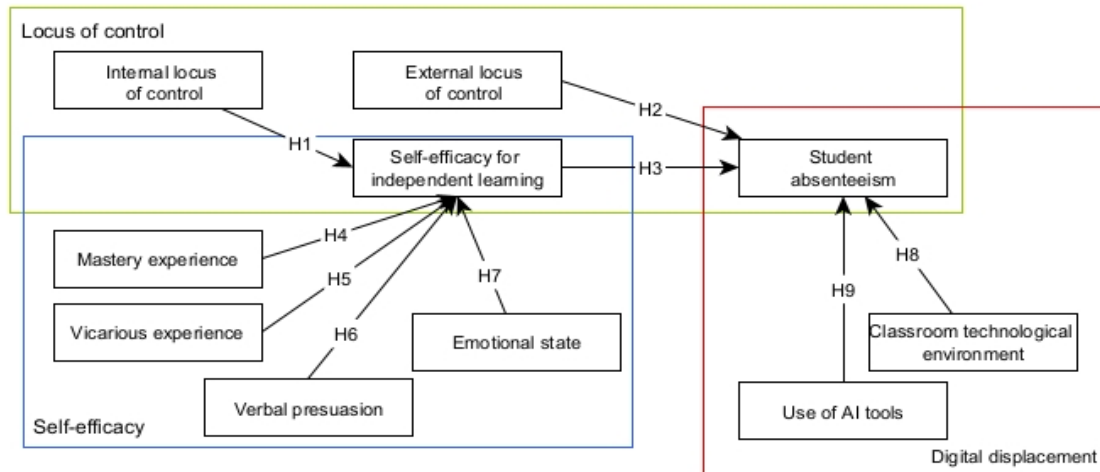


Figure 1. Research model.

4 Methodology

As the next steps in this research-in-progress paper, a mixed-methods approach could be applied, starting with a quantitative phase followed by a qualitative phase. Data collection would involve a survey and semi-structured interviews. The survey aims to gather a representative sample of 400 responses among university students in Portugal, ensuring statistical validity. This aligns with established survey research practices, as 400 responses have been used in similar studies to ensure representativeness (Neves et al., 2024). Gender quotas will be used during data collection to ensure a balanced and inclusive sample. To gain deeper insights after quantitative analysis, ten semi-structured interviews with students, teachers, and education experts would be conducted.

Quantitative data will be analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM) (Hair et al., 2017) to test hypotheses and validate the research model, while qualitative data will be thematically codified to extract patterns and insights. Ethical procedures include informed consent, anonymity, voluntary participation, and compliance with ethical research standards.

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