

DRIVERS AND BARRIERS TO GENERATIVE AI ADOPTION AMONG STUDENTS OF INITIAL TEACHER EDUCATION PROGRAMMES

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Abstract

Motivation for the paper: This paper examines one of the most prolific transformations in the education context in modern times from the student perspective – that of the rapid evolution and pedagogical impact of Generative Artificial Intelligence (GenAI). This technology can be viewed both as a source of inspiration and contention. The realisation of GenAI's transformative benefits in terms of teaching, learning, and assessment needs to be appropriately scaffolded so as to ensure that students adopt GenAI in an ethically responsible manner cognizant of the importance of maintaining academic integrity. However, in most studies to date, the student voice in relation to GenAI adoption is largely unheard. *Objectives:* This paper examines the drivers and barriers to the behavioral intention to adopt GenAI among students of initial teacher education programmes in Ireland. This particular context is an interesting one as students play a dual role – as students themselves within their academic programmes and as student teachers within an external school environment. *What was done? How it was done and validated?:* A quantitative online survey instrument was developed to examine GenAI adoption drivers and barriers, with survey constructs informed by a systematic review of literature focused on AI adoption in higher education. This instrument was pilot tested, refined, and subsequently administered to a purposive stratified sample of 600 students enrolled in initial teacher education programmes in Ireland. Data collection resulted in 290 usable responses, achieving a 48% response rate. Analysis of the survey data was performed using both SPSS and N-Vivo. *Results and conclusions:* The study's findings offer illuminating insights into GenAI adoption drivers and barriers among students of initial teacher education in Ireland. The insights gleaned inform a number of recommendations regarding the need to extend existing technology adoption models to better account for the nuances of GenAI adoption and regarding the structures and supports that need to be embedded within educational institutions to foster more effective student engagement with GenAI.

Keywords: *Generative AI, GenAI adoption, drivers, barriers, higher education.*

1. Introduction

The rapid evolution and pedagogical impact of GenAI (e.g. AI chatbots such as ChatGPT) represents one of the most prolific educational revolutions in modern times. The technology's potential to positively transform teaching and learning while simultaneously threaten the foundations of higher education 'as we know it' make it both a source of inspiration and contention in the broad education context. Adoption of any new technology involves a fine balance between confidently leveraging the technology's functionalities to deliver practical benefits and between weighing the negative impacts of the technology. A review of GenAI research in higher education highlights that the student voice in terms of GenAI adoption is largely unheard in previous studies. An understanding of what motivates and deters students from adopting GenAI in their studies is a gap in the existing literature that this paper seeks to address. This paper explores the drivers and barriers of GenAI as seen through the eyes of student teachers – students enrolled in undergraduate initial teacher education programmes in Ireland. This is an interesting context to study given that such students not only need to consider the adoption of GenAI within their own academic studies but also in terms of them acting as student teachers within an external school environment. The research question addressed is as follows: *What are the drivers and barriers to GenAI adoption among students enrolled in initial teacher education programmes in Ireland?*

2. Literature review – The student perspective

The proliferation of GenAI has brought about opportunities to transform teaching and learning but in so doing poses a considerable threat to academic integrity and current approaches to learning (Mao et al, 2023). From a beneficial perspective, AI personalises the learning experience to individual learning styles, offering students adaptive and interactive learning opportunities (Bennett & Abusalem, 2024). This is particularly advantageous to students with learning difficulties, diverse learning needs, or non-native speakers (Kooli, 2023). Acting as a personal tutor, AI chatbots provide students with tailored, personalised instruction and real-time feedback enabling them to learn independently and improving their understanding of complex material (Mogavi et al, 2024). Other beneficial impacts pertain to their use within the classroom setting, supporting collaborative problem solving, student creativity, teamwork skills, and enhanced student engagement (Mao et al, 2023). From a disadvantageous perspective, GenAI poses considerable risks in terms of diminishing student critical thinking skills, writing skills, and in-depth understanding through over reliance on AI; the true learning process may be bypassed limiting student engagement with the subject matter. Further, misinformation and biases encoded in the AI system may negatively impact on a student's worldview (Kooli, 2023). The most significant challenge is the potential for academic misconduct in light of the sophistication of AI-generated content, with many students now cognisant of the implications of plagiarism for their academic grades (Wang et al, 2024). Some students using AI to produce assessment output may receive an unfair advantage over those not adopting the technology, further compromising the integrity of academic assessments (Chan, 2023).

3. Methodology

This study adopted a quantitative research approach based on the administration of an online survey instrument, whose constructs were informed by a systematic review of the existing literature. The survey sought to gather responses to a series of closed five-point likert scale questions and a number of open-ended questions to provide a richer understanding of the issue investigated. Purposive stratified sampling was employed, requiring respondents to be enrolled in undergraduate initial teacher education programmes in Ireland. The study's sample consisted of 600 students. Data collection resulted in 290 usable responses (48% response rate). Analysis of the quantitative closed questions was performed using SPSS, while the qualitative open-ended questions were coded and thematically arranged using N-Vivo.

4. Findings and discussion

4.1. Drivers

4.1.1. Enhanced student understanding. 50% of respondents (n=245) found AI chatbots increased their academic understanding. Respondents noted that AI chatbots '*break things down into manageable explanations*' and '*simplify abstract concepts*'. For some students the benefit pertained to better understanding of course material and assignments. One student mentioned the need to use AI chatbots if they were '*at a complete loss with an essay title or assignment task*'. Enhanced understanding was a result of the functioning of AI as a dialogic partner. Students mentioned the availability of and '*interactivity with an immediate tutor*' that provided '*layman explanations*' and '*broke down broad academic questions for easier digestion*'. These findings are also evident in previous studies. Mogavi et al (2024) discuss the role of chatbots in enabling students to grasp and retain complex concepts by providing students with tailored instruction, explanations, and analogies, personalised to individual learning styles. The dialogic nature of AI chatbots makes student learning more interactive and dynamic and fosters deeper understanding of the material investigated (Bennett & Abusalem, 2024). Hsiao et al (2023) further highlight the beneficial impacts of real-time feedback and independent study at students' own pace in enhancing student learning.

4.1.2. Ease of GenAI use. 67% of respondents (n=194) found AI chatbots easy to use; 52% (n=151) found interaction with them to be clear and understandable; while 55% (n=X) found that learning to use AI chatbots took little effort. The consensus among the majority was that using AI chatbots was a straightforward process, described by a number of students as '*self-explanatory*' and '*almost foolproof*'. Much previous research echoes these findings. Effort expectancy has been found to have a significant impact on the attitude and behavioural intention of higher education stakeholders towards the adoption of GenAI (Chatterjee & Bhattacharjee, 2020). Students' use of AI chatbots is related to the ease with which they provide students with answers they require in a minimum amount of time (Acosta-Enriques et al, 2024; Amer et al, 2024). Adoption is enhanced by tools that have user friendly interfaces that lowers the cognitive load particularly for those who may be less tech savvy (Gupta, 2024).

4.1.3. Enhanced student productivity. 50% of respondents (n=245) noted that they found AI chatbots useful in their academic studies, enhancing productivity in two key areas: idea generation and academic writing. AI chatbots supported the creativity and brainstorming processes enabling respondents to *‘see out of the box ideas on topics’*. Students were motivated to use AI chatbots when they *‘hit a block and can’t get the flow of thinking going’*. Productivity was also enhanced through academic writing supports including improving sentence structure, grammar, and referencing. Similarly, a research study by Sobaih et al (2024) found that performance expectancy was the second best predictor of students’ intention to use ChatGPT, with the technology enhancing student productivity. Further, Al-kfairy (2024) found that students were motivated to adopt ChatGPT because the technology could enhance their effectiveness in academic tasks. Within the classroom, AI tools can be employed to support collaborative problem solving, teamwork skills, and greater student interactivity. By pinpointing areas where students struggle, GenAI can supply on-demand resources, offering a customised learning experience (Mao et al, 2023).

4.1.4. Enhanced student efficiency. 57% of respondents (n=165) intimated that their academic queries could be answered quickly using AI chatbots. Respondents mention how GenAI *‘allows you to gather a range of resources much quicker, there’s no time wasting looking for references’*. Motivation to use AI was largely driven by feelings of stress which were often manifestations of a perceived *‘unmanageable workload’*. Use of AI chatbots were noted to potentially give students *‘extra time to focus on tasks they find hard’*. The primary benefit appeared to centre on assignment writing and avoiding *‘late submissions’*: it *‘makes writing assignments faster when I’m running out of time’*. In previous research, efficiency in task completion, saving individuals both time and effort, is widely noted as a driver of GenAI adoption. Gupta (2024) found that the utilitarian benefits of GenAI tools enable individuals to improve their efficiency by completing research-related tasks faster, while Al-kfairy (2024) highlighted how ChatGPT streamlines more administrative-type tasks providing an enriched educational experience.

4.1.5. Resources and knowledge to support adoption readiness. 72% (n=353) and 58% (n=284) of respondents felt they had both the necessary resources and knowledge respectively to use AI chatbots. However, the GenAI competences students possessed seemed to be due to the technology’s ease of use rather than specific supports provided by their university. Only 9% of respondents (n=44) felt that their university sponsored AI chatbot-related learning opportunities. One student commented: *‘teach me how to use it and when in order to allow me to focus on my studies and get answers to questions when needed’*. Previous research solidifies the importance of having the necessary facilitating conditions in place (Acosta-Enriquez et al, 2024). According to Chatterjee & Bhattacharjee (2000), the availability of high quality technical infrastructure, training and other resources may help individuals to more readily adopt GenAI. GenAI literacy training and guidance on how to apply GenAI ethically and responsibly is critical in reducing the likelihood of accidental plagiarism and in reassuring those who are anxious of adopting GenAI due to misconduct concerns (Van Slyke et al, 2023).

4.2. Barriers

4.2.1. Risk of academic misconduct. 85% of respondents (n=247) suggested that use of AI chatbots increased potential for academic misconduct. Interestingly, one respondent stated: *‘my only experience of students using AI is using it to cheat or plagiarise work’*. The majority of comments pertain to consequences of academic misconduct and the severity of disciplinary action. The primary concerns include the risk of *‘getting poor grades’*, *‘failing a module or assignment’*; and *‘having to repeat’*. One student commented that *‘the chances of getting in trouble outweigh the reward of using it’*. Academic misconduct is a prominent issue outlined in previous studies (Mao et al, 2023), highlighting concerns of plagiarism, contract cheating, and the authenticity of student work (Moorhouse et al, 2023). Studies by Oc et al (2024) and Budhathoki et al (2024) suggest that academic dishonesty and authorship were pivotal concerns in students’ decisions to adopt GenAI. Similarly, in a study of pre-service teachers, Wang et al (2024) noted how they reduced their intention to adopt GenAI due to the potential implications of plagiarism.

4.2.2. Negative impact on the overall learning experience. Only 26% of respondents (n=75) believed that AI chatbots increased their chances of getting higher academic grades. Some of the most prolific barriers to adoption pertained to the impact on students’ critical thinking skills. Repondents stated *‘students lose the ability to research and think for themselves if they take AI’s answer as absolute fact’*. The impact of this is associated by respondents with *‘lack of creativity’*, whereby students *‘are not able to brainstorm ideas’* or *‘come up with answers/solutions on their own’*. Further, students’ content knowledge and academic writing skills may be dramatically impeded. A predominant belief was that the broad sweeping capabilities of GenAI breed an air of reliance, laziness, and disengagement and negatively impact

the overall learning experience – GenAI ‘*reduces feelings of self-worth within students’ work and gives them a false sense of achievement*’. In previous research, Chan (2023) suggested that the negative impact on students’ ability to independently analyse academic challenges may be a concern for their overall skill development and, while Oc et al (2024) regard AI as useful for routine tasks, its potential to stifle intellectual development was found to be a concern. Student problem-solving skills, critical thinking skills, writing skills, and creativity were also found to be negatively impacted in previous research (Chan, 2023).

4.2.3. Potential for misinformation and bias. 79% of respondents (n=230) believed that AI chatbot generated responses were not always correct. Respondents cite ‘*false/fake information*’ and ‘*misleading information*’ to reflect potential outcomes from GenAI use. The possibility of relying on information that hasn’t been verified is recognised as a further risk. Concerns regarding misinformation and bias and the potential for students to accept GenAI output as being the objective truth are also widely reported in previous studies. The ‘AI hallucination effect’ is linked to potentially poorer educational outcomes and compromised academic integrity (Mao et al, 2023). Potential exists for various types of biases to be assimilated by AI (Kooli, 2023) with negative consequences for students’ real world perception. Further, Oc et al (2024) highlight that lack of transparency surrounding AI algorithms can increase student mistrust; the relative inability to trace GenAI outputs back to their original source results in a ‘*black box*’ perception that increases reluctance towards GenAI adoption (Castelvecchi, 2016).

4.2.4. Lecturer perception of GenAI use. Only 16% of respondents (n=46) believed the university’s academic staff were helpful in students’ adoption of AI chatbots. The message largely reported by students was that, in the main, lecturers discouraged the use of AI chatbots within their modules. Respondents stated: ‘*lecturers deem AI totally wrong in an academic setting*’ and ‘*lecturers discourage it through AI detectors and fearmongering*’. Previous studies have also raised the importance of lecturer influence. For example, Bower et al (2024) reported that the extent to which GenAI is successfully integrated in education is shaped by the openness of educators to incorporate the technology into their teaching and assessment practices. Other studies have noted that when instructors adopt supportive, knowledgeable, and transparent approaches, they tend to encourage responsible use. In contrast, unclear or punitive stances can discourage ethical engagement and heighten student anxiety towards GenAI (Mogavi et al, 2024).

4.2.5. Technological (AI) anxiety. 54% of respondents (n=156) reported that they were apprehensive about adopting GenAI. The primary anxiety pertained to the risk of plagiarism and the negative impact on the integrity of education. One student stated ‘*I feel apprehensive to use it due to the stigma surrounding AI chatbots*’. A further key anxiety pertained to GenAI’s negative impact on critical thinking skills and the overall learning experience. Respondents noted ‘*I feel it is dumbing people down. The idea of a degree is to learn and use your own mind, not AI*’. For some respondents, anxiety was based on their lecturer’s perception of GenAI use and their own depth of GenAI knowledge. In previous research, Wu & Li’s (2025) study highlighted that the greater a person’s level of AI anxiety is, the lower their level of GenAI adoption. Within the education context, studies have found that pre-service teachers’ intention to use GenAI was widely impacted by AI anxiety (Falebita, 2024). Further, anxiety was a significant negative factor in students’ learning motivation (Wang et al, 2024) and on their perception of success when learning in synchronous hybrid learning environments (Butz et al, 2016).

5. Conclusions

This paper has presented a detailed exploration of the drivers and barriers perceived by student teachers in terms of GenAI adoption. Of particular interest was the level of awareness respondents demonstrated of the negative implications of GenAI use. With GenAI impacting every industry and sector, graduates must be prepared for a workplace that is increasingly shaped by AI. From a practical recommendation perspective, in line with their responsibilities under the EU AI Act, higher education institutions need to foster a culture of ethical and responsible GenAI use. This involves providing AI literacy training that enables students to understand how to scrutinise GenAI outputs to recognise misinformation and biases. It also requires the rollout of AI-specific academic integrity training to make students aware of the implications of integrating GenAI into academic work, thereby alleviating concerns regarding accidental academic misconduct. Lecturers on academic programmes have an importance role to play. Those who consistently take a negative stance on AI may result in some students using AI without adequate academically-informed knowledge of AI’s pros and cons; on the other hand some students who are unsure about using the technology, perhaps for reasons of technological anxiety, may be discouraged, placing them at an increased disadvantage relative to those who embrace it. From a theoretical perspective, existing technology adoption models need to be extended to account for the nuances of GenAI adoption. For

example, while most of the drivers and barriers can be explained by UTAUT (Venkatesh et al, 2003), it should be expanded to incorporate constructs pertaining to technology adoption risk and anxiety.

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