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Creating personalised learning through the use of AI powered teaching assistants: perceptions of higher education educators

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Abstract

This study aims to evaluate university lecturers' perceptions of AI technology and its use in education, as well the extent to which advanced AI teaching assistants can offer an effective means for more personalised learning opportunities. The study interviewed 10 lecturers from a UK Business School and found that whilst overall most saw potential uses and benefits of using AI, the majority of lecturers have significant concerns. These concerns related to the reliability and accuracy of AI, a removal of personal connection between lecturer and student, AI being seen to represent them and their views/knowledge and concerns related to the necessary resources needed to understand and embed AI into their teaching. If AI is to be used to create more personalised learning, then universities need to support staff to understand, explore and embed these tools, whilst also addressing the concerns they have.

Keywords: *artificial intelligence; personalised learning; higher education.*

1. Introduction

Higher education in the UK, and many other countries, has changed significantly in recent years, with larger and more diverse student groups. Standardised learning approaches that treat all students the same have proven ineffective for these diverse learners (Aggarwal, 2023; Shemshack and Spector, 2020). Instead, personalised learning is increasingly being seen as a more effective way to help prepare students for their careers by allowing them to tailor their studies to changing job markets (Kinash et al., 2014).

However, implementing this approach faces several challenges, including limited resources and a lack of necessary technology (Xu, 2024; Baskara, 2023). One possible solution is the adoption of Artificial Intelligence (AI).

With the development of AI tools, there has been a growing body of research into their use in education. However, innovations in this area mean that AI and the tools it can support, are evolving at a significant rate and creating increasingly sophisticated means to teach, support and assess students. There is a need for research into the potential use of more advanced and specific AI tools by educators.

One such use is the creation of human-like avatars, which can interact with students. These advanced tools have been used in a small number of education settings to provide more human-like interactions with users (Fink et al., 2024). This study aims to evaluate university lecturers' perceptions of advanced AI technology and its use in education to provide personalised learning opportunities for students.

2. Literature Review

This literature review will explore the concept of personalised learning, challenges of delivering this and the extent to which advanced AI tools may offer a solution to these challenges.

2.1. Need for personalisation in education

Personalisation in education involves tailoring the learning experience to individual learners, such as providing resources based on factors such as students' abilities, prior knowledge, or personal relevance, or by offering adaptive assessments that adjust difficulty based on performance (Keppell, 2014; FitzGerald et al., 2017). However, critics like Selwyn (2016) argue that in practice, personalised learning has often been oversimplified to merely present the same content in different sequences for different students.

2.2. Challenges for Universities to provide personalised learning

Educators often face challenges in designing and delivering personalised learning experiences that cater to the diverse needs of their students (Aggarwal, 2023; Grubaugh and Levitt, 2023). Prowse, et al., (2020) found that while universities increasingly emphasize personalised learning to attract students, the reality of personal tutoring, a common form of support, often falls short.

Assessing and addressing individual learning needs can be time-consuming and resource-intensive (Rudolphet et al., 2024), with universities often not having the necessary infrastructure to support personalised and interactive learning experiences (Xu, 2024). A study by Liu et al., (2024) emphasises how increases in the size and diversity of cohorts, is putting increasing strain on educators, resulting in them struggling to provide the necessary educational and pastoral support.

2.3. Growing use of advanced AI tools in education

There have been a growing number of AI-enabled personalisation platforms such as Realizeit, AutoTutor, and the Adaptive Mobile Learning System (AMLS). These systems can adapt content delivery, provide personalised feedback, and adjust learning pathways based on students' performance and engagement, addressing the crucial challenge of personalisation in education. However, as Kabudi et al., (2021) points out, there remains a significant gap between the potential of AI-enabled learning interventions and their practical application. Their study highlights that while these systems can address some challenges, they often fall short in overcoming complex educational issues and in being fully utilised by educators and students.

2.4. Self-regulated learning and AI

Chang et al., (2023) argue that AI chatbots should be used in the classroom in ways informed by Zimmerman's self-regulated learning (SLR) framework. They argue that teaching students how to prompt and reverse prompt AI chatbots is important for developing students SRL. They also argue that data driven tools that provide learning analytics help learners to reflect on their learning and develop SLR strategies. Whilst there is a growing body of research into the role and uses of generative AI tools (such as ChatGPT) in education. There is limited research into the use of more sophisticated tools such as AI avatars.

2.5. Educators' perceptions of the use of AI in universities

Shamsuddinova, et al. (2024) found that educators were fairly optimistic about AI and open to its adoption in education. However, they also found that a lack of understanding and training in using AI tools is a significant barrier to its use. They also found socio-cultural reservations, systematic resistance to change, lack of structured policies and available resources were potential barriers to AI' adoption in education.

3. Methods

In order to address the aims of this study, semi-structured interviews were conducted with 10 Lecturers from a UK Business School.

There were a mix of lecturers and senior lecturers. Lecturers predominantly came from the academic areas of innovation management, entrepreneurship and marketing. Below are details of the various participants.

Table 1. Interview participants

Participant	Role	Academic Subject Area	Years of Teaching
1	Senior lecturer	Innovation and Science Policy	8
2	Senior lecturer	Innovation Management	9
3	Senior lecturer	Sustainability and Innovation	15
4	Lecturer	Sustainability and Innovation	4
5	Senior lecturer	Marketing	7
6	Senior lecturer	Entrepreneurship	20
7	Senior lecturer	Innovation Management	21
8	Lecturer	Entrepreneurship	10
9	Lecturer	Innovation Management	30
10	Senior lecturer	Marketing	16

Interviews were conducted both in-person and online. The interview questions focused on their familiarity with AI tools in education, their previous use and perceptions of AI and it's use in education. They were questioned specifically on their attitudes towards the use of advanced AI tools using avatars as teaching assistants and the use of AI to create more personalised teaching opportunities. To aid participants who may not be familiar with the functionality of such tools, a list of potential functions was given to them, and they were asked to discuss and rank these. These functions were identified by reviewing existing AI tools and platforms. The qualitative data was analysed using thematic analysis. Key themes were identified around the attitudes and perceptions of educators as well as challenges and barriers to the adoption of AI for education perceptions.

4. Analysis and discussion

The main areas of focus for this analysis are lecturers general perceptions of using AI to improve personalized learning, using an AI teaching assistant and the different functionality of AI tools.

4.1. AI as an aid for personalized learning

Out of the ten participants, a significant majority recognised the potential of AI-powered tools to enhance teaching and learning, particularly in providing personalised learning experiences and addressing specific challenges students face. However, most participants also expressed

concerns about the practical implementation of these tools, the need for proper training, and the potential risks associated with their misuse.

Participant 5 emphasised that AI can significantly support personalised learning. They remarked, "AI can definitely help... AI can definitely serve some important function", but they went on to say, "AI is designed to support, not to replace... we still need to design it, we still need to frame it in a way that AI does the job that we need it to do".

Participant 2 mentioned the potential benefits of AI tools for overcoming language barriers. They pointed out, "people struggling purely because of language barrier... AI can help facilitate understanding by simplifying language". Participant 2 mentioned concerns about the practical aspects of adopting new AI technologies, particularly the learning curve associated with new platforms. They stated, "you need a tutorial, always... because we all use Excel and Word, but we only use like 5% of the features". This underscores the need for comprehensive training and support to ensure that educators can fully utilize AI tools without being overwhelmed by them.

Overall, lecturers identified a fairly limited range of ways AI tools can create personalised learning opportunities, whilst there were some perceived benefits, there were also concerns and perceived barriers to its adoption and full utilisation.

4.2. Lecturers' perceptions of AI avatars as teaching assistants

Out of the ten lecturers interviewed, three showed a level of comfort or interest in using AI avatars as teaching assistants, while the other seven expressed varying degrees of concern or scepticism. The main issues raised included the authenticity of AI avatars, the potential loss of personal touch in teaching, and the need for adequate support and control over the technology.

Participant 6 expressed a positive outlook, stating, "I think that'll be quite good fun," although they did clarify that they wanted to have some control over the avatar's appearance. Participant 3 was also positive and found the idea "really interesting" and was open to experimenting with it, especially if institutional support and resources were provided. Participant 10 reflected a generally optimistic view, they commented, "I think we're at an exciting time and I think there's quite a lot of potential in looking into how AI broadly, and avatars as part of that, form part of a teaching offering".

However, the majority of lecturers were more hesitant than optimistic. Participant 8 acknowledged potential benefits but questioned the appropriateness of AI in contexts that rely heavily on interpersonal skills, stating, "From a learner's perspective, those developing that set of personal communication skills are also, I think, an important element of it". Some lecturers had concerns about avatars that may resemble them, or which may be perceived to be giving content and answers on behalf of them, Participant 2 stated "I'm not very comfortable of having, like, a fake version of me saying things that I don't have control over." This highlights a

significant concern among educators about the loss of personal control and authenticity when using avatars and potentially deepfake technology.

Participant 9 took a broader view, recognising the potential of AI avatars but also the challenges of fully understanding their implications at this early stage. They mentioned, "I think at the moment it feels like we're at a very experimental time. People are trying things; they may not work initially because the technology perhaps isn't yet fully developed."

4.3. Lecturers' ranking different functions of AI teaching assistants

To assist the participants with considering possible functions of an AI teaching assistant, a list of possible functions, created from reviewing existing technologies and platforms, was used and participants were asked to rank the features.

Table 2 shows that lecturers appear to favour functions where the AI tool can aid the lecturer in tasks that take considerable resources, such as grading assessments and where students are able to ask questions and check their understanding of specific content. Lecturers are less favourable to utilise AI tools as an aid to identify and understand student performance, creating video avatars of their own content or hosting discussions with students. Interestingly, answering students questions in different forms was ranked fairly highly, but hosting interactive activities like debates and discussions was ranked the lowest. There appears to be some aspects of a lecturers role, where they have a direct impact on the activity, assessing performance and challenging ideas, that they see AI as being less favourable for.

Table 2. Ranking of an AI assistant's potential functions

Ranking	AI Assistant Feature
1st	Grade assessments (based on lecturers criteria)
2nd	Answer questions on asynchronous lectures
3rd	Host Q&A sessions
4th	Check student understanding post-lectures
5th	24 hour instant answers to any questions
6th	Identifying and understanding individual student performance
7th	Create video avatars for lecturers' content
8th	Host discussions and debates and moderate these

However, even for the more favoured functions, there was still quite a degree of scepticism for their use. Only two out of the ten participants were somewhat optimistic about the potential for

AI-assisted grading to reduce workload, particularly in specific contexts like mathematical or technical subjects. Participant 7 stated "It'd be great to put it all into ChatGPT and have ChatGPT mark it...we gotta embrace [AI], right, rather than resist". However, the other eight expressed significant reservations about the current capabilities of AI, particularly regarding its ability to handle subjective assessments that require a deeper understanding of content and context. Participant 5 raised concerns about the accuracy of AI grading, noting that despite setting clear criteria, "it's still not accurate" and that AI might struggle with "the slight differences in the neurons," referring to the unique ways students express themselves.

5. Conclusion

Whilst it can be seen that there is potential for AI to be utilised as a teaching assistant and aid personalized learning, the lecturers in this study on the whole demonstrated considerable hesitation and scepticism in its use. The main concerns were around the quality and reliability of AI, AI being seen to represent them and their views/knowledge, the resources required to learn how to use it correctly and its use in situations which would normally involve personal interactions between lecturers and students.

If AI is to be used to create more personalised learning, then universities need to support staff to understand, explore and embed these tools, whilst also addressing the concerns they have.

Whilst this study adds to our understanding of educators attitudes and perceptions of emerging AI technologies and tools, there is a need for future research to investigate this with educators from a wider range of subject areas and universities. With tools already developed and in use in some institutions, future research should also collect data on specific tools and educations perceptions of them when utilized in their classrooms.

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