Assessing AI literacy among academic staff: insights from a higher education survey

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Abstract

This study explores the level of artificial intelligence (AI) literacy among academic staff. Using the 'technological pedagogical content knowledge' (TPACK) framework, we employed mixed-method research, collecting data from 106 academic staff members across various disciplines. We investigated the challenges and benefits of educators adopting AI as well as their AI understanding, abilities, confidence and competencies. Our findings indicate a low rate of AI adoption by academics, with most applying it superficially for lower-order tasks. Our findings also reveal the different weighting of the TPACK framework components – technological knowledge (TK), technological content knowledge (TCK) and technological pedagogical knowledge (TPK) – with major concern raised by staff on TPK where it is indicated that staff need guidance and training on how to make the most of AI in their teaching. The significance of this paper lies in its exploration of the current state of AI adoption among academic staff, highlighting both its benefits and challenges. Given the limited existing research on AI literacy from the perspective of academic staff, this study offers a distinctive and valuable contribution to the discourse. Furthermore, the integration of the TPACK framework offers a crucial perspective, emphasising the need for a more comprehensive and effective incorporation of AI into educational practices.

Keywords: AI literacy, staff perception, higher education, AI adoption, TPACK

1. Introduction

The rapid advancement of AI in educational settings, beginning in November 2022, has become a focal point of academic discourse (Al Abri *et al*., 2025; Alharbi, 2023; Zhou and Schofield, 2024). Discussions and academic writing have focused on educational offerings, including the potential benefits and challenges of AI in educational applications **(**Jia, 2024, Kristjánsson *et al*., 2024, p.19, O'Dea, 2024). AI is recognised for enhancing learning by supporting research, idea generation, collaboration and skill development in reading, writing, critical thinking and problem-solving (Lodge *et al*., 2023; Kasneci *et al*., 2023). However, concerns remain about ethics, academic integrity and privacy (Celik, 2023). Most studies focus on students' perspectives, particularly on academic integrity, assessment and responsible AI use (Lodge *et al*., 2023; Kasneci *et al*., 2023).

With growing pressure from stakeholders like governments, students and employers to embrace AI, AI readiness among academic staff is crucial. The Russell Group highlights AI literacy for students and educators (Russell Group, 2023). The Alan Turing Institute developed an AI framework for businesses and individuals (The Alan Turing Institute, 2024). Arizona State University offers ethical AI training (Jensen, 2024) and King's College London provides a MOOC for students (King's College London, 2023).

Staff attitudes are crucial in meeting higher education (HE) stakeholders' needs, with resistance potentially hindering AI integration (Al-Mughairi and Bhaskar, 2024). This study examines barriers to AI adoption, assessing academic staff's understanding, abilities, confidence and competencies. It evaluates familiarity with AI concepts and confidence in using AI tools in teaching and practice, defining AI concepts as the capabilities, usage and applications of AI tools across various fields. This study will address the following questions: 1) What is the current level of AI literacy among the staff? 2) What benefits and concerns do staff identify regarding the adoption of AI in teaching and research?

This study contributes to the expanding body of research on AI in education in two significant ways:

- by providing insights from an academic staff perspective. While previous studies have focused on students' perspectives (Zhou *et al*., 2024), there are limited studies investigating academic staff perspectives on incorporating AI into their practice (Celik, 2023).
- by contributing to the application of the 'technological pedagogical content knowledge' (TPACK) framework within AI adoption, arguing in line with Celik (2023) and Sperling *et al*. (2024) that technological and pedagogical knowledge (TPK) is crucial to integrating AI-based tools in education. The paper begins with a literature review of the benefits and challenges of AI adoption in HE, including staff AI literacy and TPACK. It then outlines the study methods, presents a detailed analysis of the results and concludes with key implications and the significance of the findings.

2. Literature review

2.1 Benefits and challenges of AI adoption in higher education

The adoption of AI in HE offers numerous benefits, including enhanced efficiency in educational processes, personalised learning and expanded access to information (Cui and Alias, 2024; Kasneci *et al*., 2023). For example, AI tools can act as assistance tools, offering round-the-clock personalised help to students (Al-Mughairi and Bhaskar, 2024; Yang *et al*., 2024). The benefits of AI include its ability to facilitate self-directed learning among students (Zhou *et al*., 2024) and enhance critical thinking (Essien *et al*., 2024). Research by Zhai (2023) and Einarsson *et al*. (2024) found significant enhancements in student engagement and problem-solving abilities using scenarios generated by ChatGPT. Chiu (2023) argued that students with academic struggles feel more confident using AI, which can significantly enhance their academic performance. To academic staff, benefits include using AI to streamline administrative tasks and focus more on educational activities, such as lesson planning (Chiu, 2023; Kasneci *et al*., 2023). Other benefits include the use of AI to brainstorm research topics, conduct systematic literature reviews and analyse data, further broadening its application in scholarly activities (Titko *et al*., 2023).

Some challenges include the risk of lowering academic standards, leading some academics to advocate for prohibiting students from using AI some academics advocate prohibiting students from using AI (Eke, 2023). Similarly, Barakat *et al*. (2024) observed that, though educators recognise the potential benefits of AI in teaching, concerns about ethical integrity and staff anxiety pose significant barriers to its adoption. Additionally, the absence of a clear institutional policy for the effective usage of AI in teaching and research introduces further uncertainty for staff as to how they may confidently permit students to use AI in their learning (Titko *et al*., 2023). A growing body of research is delving into both the advantages and concerns relating to the adoption of AI in educational settings. While there is no consensus on banning or embracing AI in HE, it is widely agreed that maximising its benefits requires collaboration among AI experts, educators and students (Yu, 2023). The proficiency and AI literacy of academic staff are pivotal in steering the direction of HE towards improving student employability skills and achieving positive educational outcomes.

2.2 Staff AI literacy and TPACK

The framework of technological pedagogical content knowledge (TPACK), introduced by Mishra and Koehler (2006), serves as an insightful model for dissecting the various knowledge fields and skills essential for the effective amalgamation of technology – such as AI – into educational environments. For instructors to incorporate AI into their teaching successfully, they must develop skills across three primary knowledge domains: technological knowledge (TK), pedagogical knowledge (PK) and content knowledge (CK) (Celik, 2023). Within the field of AI literacy, TK encompasses an understanding of AI principles, tools and their practical applications, along with proficiency in using AI and educational technology tools. PK entails insights into the methodologies of teaching and learning, incorporating AI to bolster instructional techniques and the development of assessments, as well as in delivering educational content. CK involves expertise in the specific subject matter. However, merging and synthesising these domains are equally vital, ushering in innovative and effective AI-supported teaching methodologies (Ning *et al*., 2024).

The TPACK framework notably extends to embrace the nuances of teaching with technology, acknowledging that TK and its specific intersections – TCK, TPK, and TPACK – are essential. These components help educators understand how technology can integrate with and enhance subject-specific teaching (Celik, 2023). It also highlights challenges in and assumptions about integrating AI into pedagogy. For instance, Antonenko and Abramowitz (2023) and Sperling *et al*. (2024) illuminate the epistemic dimensions of such knowledge by examining teacher misconceptions about AI. They categorise beliefs about AI's independence and accessibility as accurate, while misconceptions – like AI's complexity for non-experts, lack of creativity and potential to replace human jobs – offer insight into the extent of teachers' understanding of AI's role and its limitations. This epistemic framework is crucial, as it influences how educators integrate technology into their pedagogical strategies, aiming to align with the evolution of educational technology.

Literature on AI in teaching and learning frequently points out deficiencies in staff's technological grasp of AI concepts and tools and the difficulties involved in integrating AI resources with pedagogical frameworks and subject matter (Celik, 2023). Bridging these AI literacy and TPACK gaps among academic staff is imperative for a constructive integration of AI technologies within HE establishments.

3. Methodology

3.1 Research design

To address the research questions, we surveyed academic staff members across all the three faculties at Queen Mary University of London (Faculty of Science and Engineering, Faculty of Humanities and Social Sciences and Faculty of Medicine and Dentistry). We adopted a mixed-method approach to obtain comprehensive insights from both qualitative and quantitative data (Creswell and Creswell, 2017). Descriptive analysis and contingency table analysis explored closed questions, while thematic analysis examined the responses to open-ended questions. The authors conducted the thematic analysis by applying Braun and Clarke (2006)'s 'six steps'.

3.2 Sampling approach

We conducted the surveys in February 2024, by means of convenience sampling, selecting participants from various schools across three faculties of a United Kingdom (UK) university, on the basis of each individual's availability. A total of 106 academic staff completed the survey: seventy from Humanities and Social Sciences (HSS), twenty-three from Medicine and Dentistry and thirteen from Science and Engineering (table 1). The sample is heavily weighted towards the Faculty of HSS (66%), limiting the generalisability of findings across disciplines. In particular, disciplinary differences in AI awareness, tool preference and institutional constraints may lead to distinct patterns of AI adoption and perceived barriers. For instance, science, technology, engineering and mathematics (STEM) and clinical staff may focus more on data-driven AI tools and coding assistants, while social science staff often engage with generative tools for writing, reflection and other qualitative tasks. The findings presented, therefore, primarily reflect the experiences and perceptions of staff from the HSS faculty.

Table 1. Distribution of survey participants by faculty

Faculty	Number of participants	Percentage of participants
Humanities and Social Sciences	70	66.04%
Medicine and Dentistry	23	21.70%
Science and Engineering	13	12.26%
Total	**106**	**100%**

3.3 Data collection

We used Microsoft Forms to create online surveys. Closed questions assessed: participants' familiarity with AI, their usage of AI, their perception of AI's impact on HE, the amount of training they had received and their confidence in using AI tools. Open-ended questions explored these topics further, addressing perceived benefits of and concerns about AI in HE.

3.4 Reliability and validity

To guarantee the reliability of our research, we implemented several measures: 1) the survey underwent a pilot test with a smaller sample of staff members not included in the main study; 2) we reviewed the responses to this survey and gathered feedback to refine questions and enhance clarity, so minimising ambiguities and ensuring consistency; 3) we sought validation from several experts in the fields of pedagogical research and AI in order to verify the survey questions. Subsequently, during the thematic data analysis, we dual-coded qualitative data. Through this triangulation approach, we ensured that the identified themes genuinely reflected participants' perspectives while mitigating bias.

4. Findings

4.1 Descriptive analysis

4.1.1 Staff AI-literacy level

Descriptive data from the five closed-ended questions are summarised in table 2. AI-powered tools were not widely used, with 51% of participants reporting no prior use. Regarding familiarity with AI, 7% were not familiar, while 58% were somewhat familiar and 35% were very familiar. Only 11% had received AI-related training for their academic roles.

Table 2. Descriptive data of responses regarding staff AI literacy level

Question	Answer	Denoted value	Number of obs	Mean	SD
How familiar are you with the concept of Artificial Intelligence (AI)?	Not familiar	1	7	2.283	0.579
	Somewhat familiar	2	62		
	Very familiar	3	37		
Have you ever used AI-powered tools or technologies in your academic work or research?	Yes	1	51	0.481	0.500
	No	0	55		
How confident do you feel in your ability to effectively use AI-powered tools in your academic work or research?	Extremely not confident	1	11	3.151	1.172
	Somewhat not confident	2	21		
	Neutral	3	27		
	Somewhat confident	4	35		
	Extremely confident	5	12		

42% of participants viewed AI's impact on HE positively, 13% held a pessimistic view and the remainder were neutral or unsure. Confidence in using AI-powered tools was somewhat or extremely high for 44% of participants, compared to 30% who were extremely or somewhat not confident.

4.1.2 Low AI adoption and poor integration

Fifty-one participants used AI tools and specified the tools they used in their work. The detailed AI tools are summarised in table 3.

Table 3. AI tools adopted in higher education

Category	Total count	Tools in category
Code assistance and development	3	Jupyter, GitHub, Copilot
Conversational AI and content generation	40	ChatGPT, Google Bard, Microsoft Bing, Monica, Claude AI,
Machine learning and data science	6	PyTorch, TensorFlow, Neural Networks

Reference management	1	Zotero
Research and data analysis	2	Elicit
Specialty and miscellaneous	2	Chat PDF
Text rephrasing and paraphrasing	1	QuillBot AI
Writing and grammar assistance	3	Grammarly, Otter

Besides the low percentage of AI usage among the HSS-dominated participants in our study (49%), the level of usage was also superficial. 36 out of 51 participants mainly use ChatGPT as a writing assistant. Example quotes include:

'ChatGPT helps to structure essays and introductions to projects' (staff 55);

'I used ChatGPT for proofreading, grammar checks, paraphrasing' (staff 72).

Participants were further categorised into four AI usage groups: no usage, ChatGPT only, moderate usage (*e.g.*, proofreading, literature review) and advanced usage (*e.g.*, advanced data analytics). A contingency table analysis (table 4) highlighted notable patterns. Among those somewhat familiar with AI, 37% had never used AI tools, 15 used ChatGPT only and 24% had superficial usage. Similarly, 27% of those very familiar with AI had never used it, while 32% used it superficially.

Confidence levels showed further contrasts. While 22% of participants who felt somewhat or extremely confident had minimal AI usage, 18% of those somewhat or extremely not confident exhibited moderate to advanced usage. This suggests a disconnect, where technical knowledge does not always align with confidence in applying AI in educational and research contexts.

Table 4. Contingency table analysis: number of staff members with different levels of AI familiarity and usage

	No usage	**ChatGPT only**	**Moderate usage**	**Advanced usage**
Familiarity				
Not Familiar	6	1	0	0
Somewhat Familiar	39	15	7	1
Very Familiar	10	12	5	10
Confidence				
Extremely not confident	0	3	2	6
Somewhat not confident	2	8	7	4

Neutral	1	12	7	4
Somewhat confident	2	19	6	8
Extremely confident	0	2	4	6

Therefore, a conundrum is posed by the fact that a significant number of the HSS-dominated cohort in our study were familiar with the concept of AI and confident in using it, yet they did not utilise or integrate it in their academic work.

4.1.3 Partial and inadequate training

Only twelve participants (11%) had received AI-related training. This low percentage may be down to a lack of training opportunities or to participants' reluctance to engage with training, particularly among the HSS-dominated cohort, where perceived relevance or confidence in self-learning may influence uptake. With the popularity and convenient availability of online training on AI, such as online modules on learning websites like Coursera and Data Camp, the first reason may be dismissed. Therefore, the low percentage is mainly attributable to the reluctance of the HSS-dominated cohort to undergo training, though it likely interacts with other factors – such as limited awareness, time constraints or insufficient institutional promotion.

Such reluctance is evident in our data. Out of the seven participants who were not familiar with AI, none of them had received any AI-related training. This suggests that they had limited knowledge of AI and were unwilling to get any training to enhance their understanding of AI. Similarly, out of the sixty-two participants who were somewhat familiar with AI, only seven of them (11%) had received AI-related training. This indicates that fifty-five participants (89% of the sixty-two) who were not very familiar with AI, chose not to pursue training to enhance their AI knowledge. We also found that the training taken by the twelve participants was partial and inadequate, mainly focusing on technical knowledge (as noted by staff 15, who holds a PhD in AI), with scant attention to the social-ethical implications or integration strategies within educational contexts.

4.2 Thematic analysis

4.2.1 Perceived benefits offered by AI

Eighty-two out of the 106 participants specified the areas or tasks they believed AI could help. As is reported in table 5, there are three main themes, including improved research capabilities, enhanced teaching quality and increased efficiency in administrative tasks.

The foremost perceived advantage attributed to AI lies in its capacity to enhance research capabilities. 45% participants were of the opinion that AI is extremely likely to assist in analysis at an advanced level. This includes the development of '*purpose-built programs for pattern recognition*' (staff 49) and the '*synthesis of routine codes*' (staff 45). They viewed AI as a powerful tool for aiding in tasks such as data analysis, information retrieval and summarisation, particularly in literature reviews, as well as in the generation or refinement of algorithmic codes.

For instance, AI was considered so powerful that it could analyse '*all types of data and stored data*'. (staff 86).

Table 5. Themes and codes of perceived benefits offered by AI, with the frequency of each theme or code reported

Themes	Freq	Codes	Freq
Improved research capabilities	48	Data analysis	21
		Information search and summarisation	19
		Generate codes	8
Enhanced teaching quality	39	Act as teaching assistants, support students' enquiry, enhance subject understanding	23
		Assist curriculum development and generate teaching material	6
		Increase interaction and engagement, collect learner engagement data	5
		Enhance critical thinking	3
		Personalise content and increase inclusion	2
Increased efficiency in administrative tasks	23	Improve language and structure of writing	19
		Speed up tedious administrative tasks	4

The second popular theme was enhanced teaching quality, with 37% of participants believing that AI tools could act as teaching assistants to support students' enquiry and enhance subject understanding, as well as to assist in curriculum development and the generation of teaching materials, improve interaction and engagement, enhance critical thinking, personalise content and increase inclusion. However, in contrast to the application of AI to research, four participants, when answering this open-ended question, believed that there were no areas for AI to contribute to education. Some even referred to AI as the '*devil*' – 'In *certain areas of research, it is heavily used to good effect; for education, it is the devil*' (staff 71) – because it could lead to student lethargy and jeopardise employability by undermining the development of critical thinking skills.

The third theme, mentioned by 22% of participants, was increased efficiency in administrative tasks, including improving writing and speeding up tedious and repetitive administrative tasks. With the help of AI, '*better quality essays (are generated) where we can focus on content instead of language use'* (staff 29).

In addition to the contrast between good integration in research versus poor integration in education, another finding consistent with the one presented in Section 4.1 is that many staff

used AI superficially for lower-order tasks such as improving language (18%) (*e.g.*, proofreading), searching and summarising existing information (18%) and assisting with teaching and administrative chores (25%). In education, AI predominantly played a supportive role, functioning primarily as a teaching assistant rather than taking the lead. For example, '[AI can] *only help with lower order tasks*' (staff 19).

4.2.2 Concerns pyramid

We summarised (figure 1) the seven themes and their codes on concerns about the adoption of AI in HE in a pyramid. We further categorised the seven themes into four types, mapping to the TPACK concepts TK, TCK, TPK and TPACK, which are shown to the left of the pyramid.

The highest-level of concern was related to policies and guidance. Given that TPACK comprises '*a combined form of knowledge and skills*' (Celik 2023) and that policies and guidance serve as synthesised frameworks guiding AI application in HE, we categorised it as TPACK. Participants showed their concerns about the lack of policies and guidance; for example, staff 93 commented that '*students are using AI-powered tools with or without our guidance anyway. It's best that we provide some guidance and clear boundaries on what can/can't be done to their work*.' Linked to the above are concerns about a lack of consistency in the use of AI and the '*over-regulation of AI*' (staff 47). Excessive regulation was cited as a factor causing academics to hesitate about incorporating AI into their teaching, as they did not want their students to face penalties.

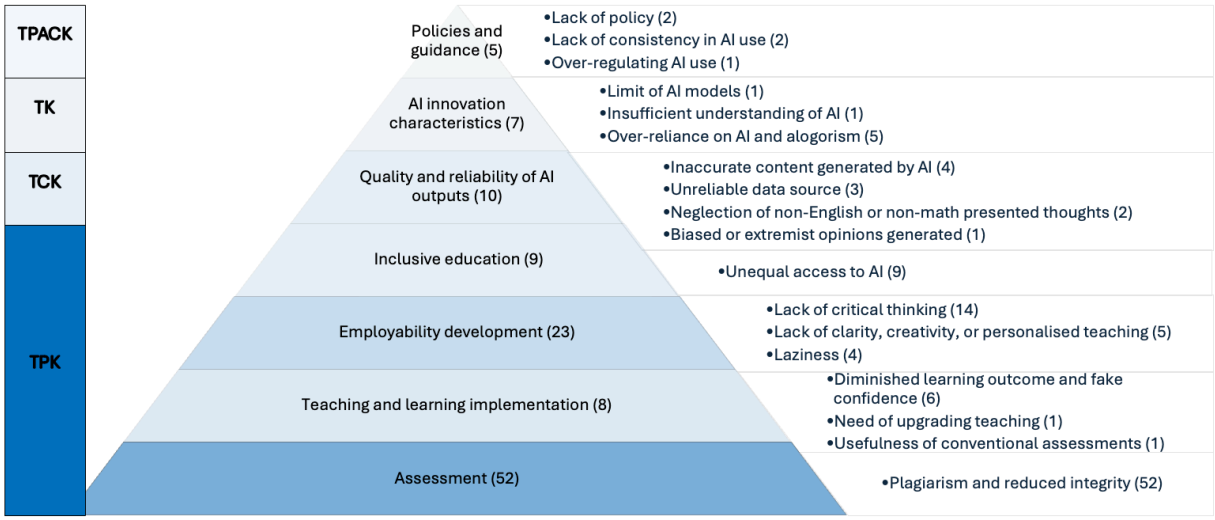

Figure 1. Pyramid of concerns about the use of AI in higher education

Under the category of TK comes AI innovation characteristics. Many educators who were not specialists in computer science or mathematics stated that they had an insufficient understanding of AI or overly relied on it. Some were also concerned about the limitations of AI technology: '*I do not understand it too well. Each time I use it, I get frustrated*' (staff 72).

Under the category of TCK, the quality and reliability of AI outputs were major concerns. AI might operate on the basis of unreliable data sources, thus generating inaccurate or even non-existing content: '*Misinformation may become embedded in learning material obtained via AI,* [and we are] *not sure* [whether] *AI is able to filter that information*' (staff 91).

Under the category of TPK, the first concern was about inclusion and academics were worried about inequalities of access: 'Not every student can afford to use AI. If the assignments are planned with AI, this may disadvantage those who do not use or do not have access to generative AI tools' (staff 59). Employability development was the second TPK theme. Fourteen participants were concerned about the lack of critical thinking by students after using AI. Other concerns about employability development included the lack of clarity, creativity or personalised teaching (mentioned by five participants), as well as the laziness of students (mentioned by four participants). For example, students might 'copy paste the information provided without checking the evidence. It might reduce their chances to develop appropriate analytical skills' (staff 80). The third TPK theme related to the implementation of AI for teaching and learning. One concern was that students might 'learn less and less' (staff 48), resulting in diminished learning outcomes. However, they might have fake confidence in the learning outcomes: 'students may not accumulate knowledge but feel that they have when using AI' (staff 85). The final TPK theme of concern was academic integrity in assessment, which was the most popular concern, mentioned by almost half of the participants. We therefore designated it as a separate theme, even though assessment is a part of teaching and learning. The participants were worried about plagiarism and loss of integrity resulting from the use of AI during assessments. One of them was also concerned about the 'redundancy of conventional assessments' (staff 11).

5. Discussion

Given that data were collected in February 2024, it is important to acknowledge the rapid pace of AI development since then, including the emergence of more powerful generative models and evolving institutional policies. These developments may have further shaped staff perceptions and usage patterns and they should be considered when discussing and interpreting our findings within a 2025 context.

5.1 AI readiness and AI literacy training

Our study aimed to explore the current readiness level in adopting and utilising AI among an HSS-dominated cohort and to identify the underlying causes behind it. The results indicate a low rate of AI adoption and, even among those who have adopted AI in HE, most used it superficially for lower-order tasks. The findings relating to poor integration of AI resources into pedagogical frameworks are consistent with those of Celik (2023) and Sperling (2024). The observation that most participants were somewhat or very familiar with the concept of AI, yet didn't use or integrate it into their academic practice, presents a conundrum. This discrepancy may be partially down to a reluctance to pursue such training or to the inadequacy of the training provided. The finding echoes those of existing studies (Walia and Kumar, 2022; Andrada *et al*., 2023), *viz*., that staff members are hesitant to embrace new technology, owing to feelings of fear and of stress about using it.

Based on our analysis, we argue that current AI training for the participants is largely ineffective. It does not significantly enhance staff members' understanding or adoption of AI. Rather, it elevates their confidence in using AI, despite many having minimal or only superficial experience with AI. If training were to be better devised and more constructive, we propose, it would be more likely to succeed in integrating AI tools into education, as Celik (2023) and

Sperling *et al*. (2024) aver. Our findings reveal that the inadequacy of AI training – focusing predominantly on technical aspects without addressing its social implications or integration into educational practices – contributes significantly to its low adoption rates. This approach to training fails to meet the comprehensive AI literacy standards recommended by Stolpe and Hallström (2024), which emphasise the need for technical skills, technological and scientific knowledge and socio-ethical understanding. Furthermore, the training does not sufficiently address key elements necessary for integrating AI into educational settings or the technology's underlying principles. According to Luckin *et al*. (2022), AI readiness extends beyond mere familiarity with AI technologies. Potent AI training should adopt a holistic and active approach, empowering individuals in HE to deploy AI to address specific needs.

5.2 Perceived benefits of AI

Our findings reveal that AI may be of significant benefit in support of academic writing. This perspective is shared by Nguyen *et al*. (2024), who highlighted the transformative potential of AI tools in academic research settings. Their studies show that student learning is enhanced when human teachers collaborate well with machine intelligence. Further, Chiu's (2023) analysis suggests that AI may dramatically enhance research practices by enabling more sophisticated data analysis and facilitating the exploration of new research avenues through superior pattern recognition and predictive analytics.

Our analysis indicates that AI tools do aid curriculum development, generating educational content and personalising learning experiences to cater to diverse student needs. This echoes the findings of Kasneci *et al*. (2023) and Rasul *et al*. (2023), who argue that AI may significantly contribute to personalised learning and engagement. This belief is further supported by Essien *et al*. (2024), who suggest that AI text generators may improve learning experiences. Chiu's (2023) work aligns with our analysis, highlighting the potential of AI in inspiring teachers with innovative teaching ideas and learning design strategies. On the basis of this evidence, we argue that AI in teaching generates ideas better, enriches personalised learning and encourages inclusive teaching strategies to meet the diverse needs of students.

Another benefit, as clearly indicated by our findings, is AI's role in the efficiency of administrative tasks. This is particularly relevant to academic settings where the administrative burden can detract from core educational and research goals. As Chiu (2023), Essien *et al*. (2021) and Fui-Hoon Nah *et al*. (2023) all agree, AI may free up academic staff to focus more on substantive teaching and research activities by automating administrative burdens.

5.3 Barriers to adopting AI tools in higher education

We identified several barriers to TK, TCK, TPK and TPACK that impede the integration of AI in teaching and learning. Our findings indicate that barriers to TK are primarily down to general unfamiliarity with AI tools or over-reliance on them. This is consistent with Gaber (2023), who explored the familiarity of academic staff with AI and found only a medium level of AI awareness.

In TCK, which is based on knowledge about the technologies employed within the content field and on an understanding of how a particular technology may contribute to teachers' content-specific knowledge (Koehler and Mishra, 2009), barriers identified include a lack of understanding of AI tools, uncertainty about which tools are most appropriate for specific teaching needs and concerns about the ethics of using these tools, as well as difficulties in

integrating AI tools with content to enhance teaching. This finding is consistent with those of Edwards *et al*. (2018) and Nazaretsk *et al*. (2022) on trust in machines, which chimes with the lack of trust by academic staff in AI tools.

Our analysis indicates that TPK presents a significant challenge, contributing to academic staff's reluctance to adopt AI. TPK encompasses knowledge about various technologies in relation to specific teaching approaches (Celik, 2023). The findings suggest that reluctance to adopt AI stems mainly from concerns about academic integrity and the possible decline in critical thinking skills, despite studies like that of Essien *et al*. (2024), which indicate that AI enhances critical thinking. There is an evident fear that students might become passive recipients of information, merely copying and pasting data provided by AI without engaging in rigorous fact-checking or evidence evaluation (Tlili *et al*., 2023). Furthermore, expressed concerns about student '*laziness*' suggest a fear that AI could encourage a more lackadaisical approach to learning, where students rely too heavily on AI for answers. This challenge is linked to the concern that students might '*learn less and less'* while developing a false confidence about their learning (Tlili *et al*., *op.cit.*). This '*fake confidence*' means that students may believe they have mastered content through interactions with AI, though they in fact lack true understanding or fail to retain knowledge.

The findings revealed gaps in the academic application of TPACK, with participants noting both a lack of policies/guidance and an excess of regulation. This point is recognised in literature, with authors calling for a need for support with regulation and AI policies. For example, Lodge *et al*. (2023) emphasise the need for holistic policies and practices that integrate AI ethically into HE. Fui-Hoon Nah *et al*. (2023) support this finding and agree that ethical concerns are a barrier. In this regard, they argue that regulatory frameworks and policy initiatives are critical to harnessing the positive aspects of emerging technologies and realising intended objectives.

6. Conclusion

Our study reveals that the current level of AI readiness among the HSS-dominated cohort is low, which can be explained by partial and inadequate AI literacy training. We further analyse the perceived benefits of and concerns about AI usage in HE through the lens of TPACK and identify seven main concern themes, largely relating to TPK. Overall, our findings indicate that comprehensive and sufficient AI literacy training is essential to equipping academic staff members so that they may succeed in integrating AI resources with their academic endeavours. Additionally, the implementation of clear and consistent policies and guidance is crucial to steering the appropriate deployment of AI tools.

6.1 Theoretical implication

We study AI literacy through the perspective of academic staff members, while prior studies on AI are mainly from the angle of students (Chan and Hu 2023; Southworth *et al*., 2023; Essien *et al.*, 2024). Expanding upon prior investigations into AI adoption within HE, we analyse the current state of AI readiness among an HSS-dominated cohort, who serve as the disseminators of knowledge. We identify the factors contributing to low AI readiness by assessing the efficacy of staff AI literacy training, enriching the literature on staff AI literacy training (Luckin *et al*., 2022). Our proposition on staff AI literacy training is also consistent with

the Russell Group (2023)'s suggested principle relating to the use of AI in education: '*Staff should be equipped to support students to use AI tools effectively and appropriately in their learning experience*'.

Our study contributes to the application of the TPACK framework by embedding it with AI technologies in HE. This aspect of our study builds upon existing literature (Celik, 2023) by categorising staff concerns regarding AI usage in HE into four TPACK concepts. We find that current concerns regarding AI usage predominantly revolve around issues related to TPK. By identifying the primary sources of obstacles hindering AI adoption, particularly in employability development and academic integrity, relevant actions may be taken to address these challenges, as discussed in section 7.2.

6.2 Practical implication

The findings offer a detailed snapshot of AI literacy levels across academic staff from various disciplines, pinpointing both strengths and areas ripe for professional enhancement. Notably, there appears to be a common misconception regarding AI; many staff members' knowledge is limited to ChatGPT, with little exploration of other AI tools relevant to their specific fields. The observation of low AI readiness aligns with earlier research (Walia and Kumar, 2022; Andrada *et al.*, 2023), suggesting a need for targeted staff AI literacy training designed to broaden and deepen AI competencies essential for effectively incorporating AI into educational practices, especially TPK-related areas, such as employability development, teaching and learning and academic integrity. This recommendation supports the guidance issued by the Russell Group on AI Russell Group (2023), which emphasises the importance of AI literacy for both faculty and students in today's AI-driven educational context.

As one of the pioneering studies on the perceived advantages and challenges of employing AI in education from a staff perspective, this research uncovers seven main themes of concerns among staff. The broadest concern is the absence of explicit policies and guidelines – the highest-level obstacle. Despite universities' efforts to integrate AI into the academic setting, the introduction of clear, comprehensive guidelines remains imperative to overcoming resistance to AI adoption and to harnessing fully AI's capabilities for improving educational outcomes.

6.3 Limitations and future research

Although we recognise that this categorisation of knowledge is context-specific and dependent on the country and educational setting, we consider these concepts sufficiently flexible and adaptable to be applicable across various contexts.

Furthermore, the scope of our research could be broadened in future studies to include longitudinal analysis, providing deeper insights into the evolving level of staff AI readiness over time. Additionally, comparative studies could be conducted to assess the effects of policy and guidance changes on AI adoption and usage, further elucidating its effects on research and education.

We also acknowledge that our sample is skewed toward the Faculty of Humanities and Social Sciences, so limiting the generalisability of the findings across all academic disciplines. This disciplinary imbalance shaped the dominant themes observed. Future research would benefit from employing a stratified sampling approach to achieve a more balanced representation

across faculties, enabling richer cross-disciplinary comparisons of staff perceptions and AI usage.

It is also important to consider the possible effects of under-reporting of AI usage on account of the self-reported nature of the data. In the absence of clear institutional guidelines, and amid concerns about possible over-regulation or monitoring, participants may be reluctant to disclose actual AI usage for fear of institutional consequences. This may have contributed to an underestimation of adoption levels, particularly among those using AI tools informally or without formal approval. Future research could incorporate triangulated methods, such as digital trace data (*e.g*., anonymised usage logs) or observational approaches, to complement self-reported responses and more accurately capture the extent and nature of AI usage. Additionally, conducting interviews or focus groups in a more confidential or trust-building context may encourage greater openness about informal or unregulated practices.

While this study focuses on a single institution, it is worth noting that all staff and students in the institution currently have free access to the web version of Microsoft Copilot. However, access to other advanced AI tools, such as premium versions of ChatGPT or specialised platforms for coding and research support, remains largely dependent on personal subscriptions or departmental resources. Future studies could use a cross-institutional design to examine how institutional provision of AI tools – including enterprise subscriptions – and the availability of relevant resources (*e.g*., AI training courses) may influence adoption patterns, equity of access and usage practices.

Declaration of interest statement

The authors report there are no competing interests to declare. The Research Ethics Committee of School of Business and Management, Queen Mary University of London, UK, has granted approval for this study on 11th October 2023 (Ref. No. DSREC48).

Data availability statement

The data supporting the findings of this study were collected through a survey conducted by the authors. According to privacy and ethical considerations, anonymised data is available upon reasonable request to the corresponding author.

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