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Are the academic staff AI literate? - A case study of Staff perception on Artificial Intelligence adoption in higher education

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Research Domains

Digital University and new learning technologies (DU)

Abstract

This study investigates the current level of AI literacy among academic staff, and identifies the perceived benefits and concerns regarding AI integration in higher education. Through the lens of TPACK framework, we conducted mixed-method research with 106 academic staff members at Queen Mary, University of London (QMUL) using a survey. Our findings reveal that the current level of AI readiness among staff is low, and even among those having adopted AI, most of them use it superficially for lower-order tasks. This can be explained by partial and inadequate AI literacy training. We further analyse perceived benefits and identify seven main themes on the concerns, mainly on Technological Pedagogical Knowledge (TPK). We contribute to the current AI discourse and literature by bringing a new perspective to AI literacy through the perspective of academic staff and suggest comprehensive training and clear policies to overcome resistance and leverage AI's potential for educational enhancement.

Full paper

This study explores the current level of AI literacy among academic staff and identifies the perceived benefits and concerns regarding the integration of AI into higher education from the staff perspective.

Literature review

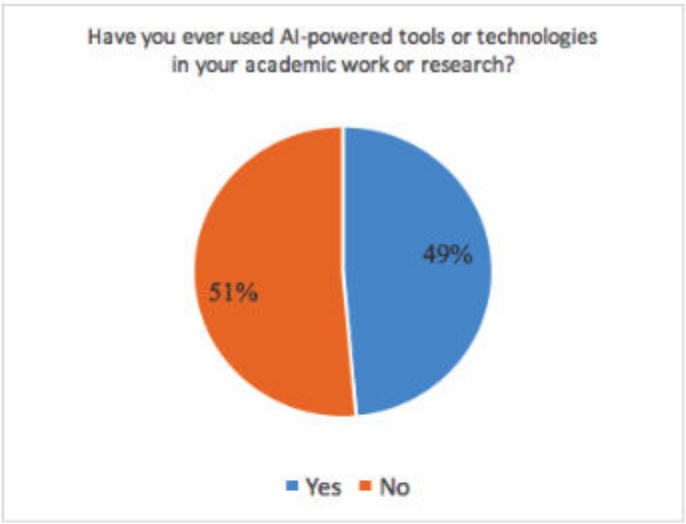
Prior studies on AI are mainly from the angle of students (e.g., Chan and Hu, 2023; Essien et al., 2024; Southworth et al., 2023; Zhou, et al., 2024). Our study aims to contribute to the current discourse of AI in higher education through the perspective of academic staff. We also contribute to the application of TPACK framework (Koehler & Mishra 2005, Niess 2005) by embedding it with AI technologies in higher education. This aspect of our study builds upon existing literature (Celik, 2023) by categorising staff concerns regarding AI usage in higher education into four TPACK concepts.

Methodologies

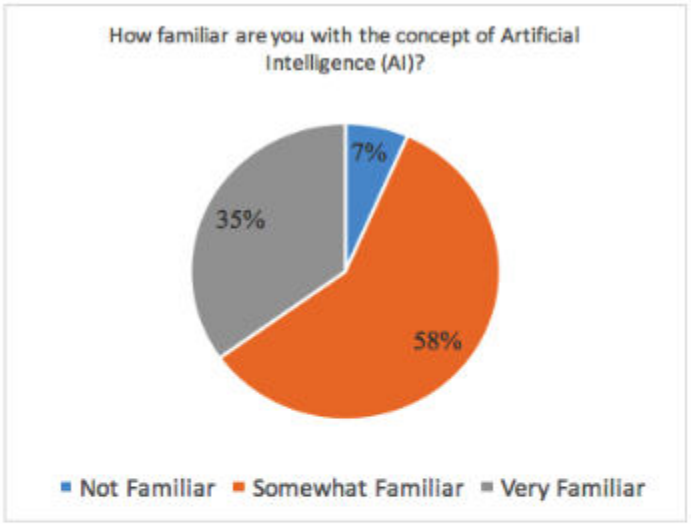
A total of 106 data was collected from academic staff members at Queen Mary, University of London (QMUL) across 6 disciplines including Humanities, Social Sciences, Science, Engineering, Medicine, and Dentistry, investigating their familiarity with, utilisation of, and perceptions regarding AI. We also explored relevant training they have received, their perceived benefits and concerns on AI usage in higher education. A mixed-methods approach is used to get comprehensive insights from both qualitative and quantitative data. Descriptive analysis, contingency table analysis (also known as cross-tabulation analysis), correlation analysis, and t-test are applied to analyse closed-ended questions, while thematic analysis employed to gain insights from the responses to open-ended questions.

Findings and discussion

Our findings reveal that the current level of AI readiness among academic staff members is low (see Figure 1), and even among those who have adopted AI in higher education, most of them use it superficially for lower-order tasks such as proofreading. The fact that almost all the academic staff members are somewhat or very familiar with the concept of AI, yet they do not employ or incorporate it into their academic endeavours, presents a puzzle. This can be explained by partial and inadequate AI literacy training. Echoing Luckin et al. (2022), AI readiness transcends mere knowledge of AI; it involves dynamic training tailored to diverse academic contexts, enabling effective integration of AI in higher education.



(a) AI usage



(b) Familiarity with the concept of AI

Figure 1: Percentage of staff members: (a) using AI-powered tools or technologie (b) with different levels of familiarity with the concept of AI; (c) having received related to AI in their academic role.

The puzzle and the worrying situation can also be explained by the limited perceived benefits and grave concerns related to the use of AI in higher education. Through the lens of TPACK, we identify seven main themes of concerns which are mainly concentrated on TPK, including policies and guidance, AI innovation characteristics, quality and reliability of AI outputs, inclusive education, employability development, teaching and learning implementation, and assessment (see Figure 2). There is ongoing discussion on how AI should be applied in education (e.g., Chiu, 2021; Ng et al., 2023), but there has been limited consistent and clear policies or guidance achieved. As evidenced by Essien et al. (2024), the implementation of clear ethical guidelines resulted in none of the students resorting to plagiaristic activities using AI.

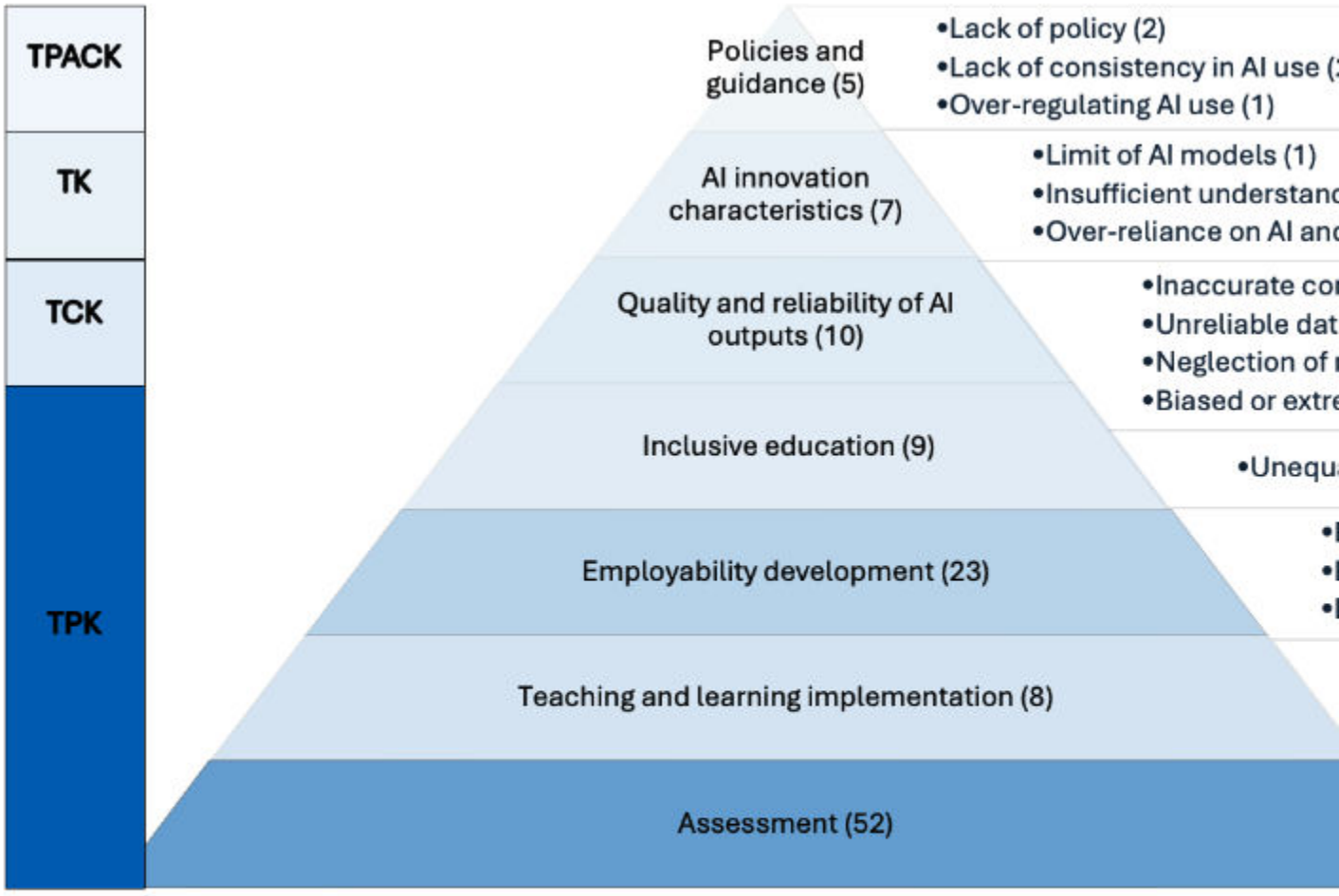


Figure 2: Pyramid of concerns about the use of AI in higher education. Left: Cor
in the pyramid: themes of the concerns; Right: codes. Counts of observations are r
implies higher frequency.

Conclusion

Our study contributes to the discourse on AI in higher education from academic staff's viewpoint, pinpointing factors behind their AI unreadiness and enriching the literature on staff AI readiness training (e.g., Luckin et al., 2022), and aligning well with the Russel Group's (2023) guidelines on the importance of AI literacy for both faculty and students in today's AI-driven landscape.

Our study also contributes to the application of TPACK framework to analyse the concerns related to AI adoption in higher education. We find that current concerns regarding AI usage predominantly revolve around issues related to TPK. By identifying the primary obstacles hindering AI adoption, particularly in employability development and academic integrity, relevant actions or training can be taken to address these challenges.

Practically, the findings offer a detailed overview of AI literacy levels across academic staff from various disciplines. Notably, there is a common misconception regarding AI; many staff members' knowledge is primarily limited to ChatGPT, overlooking other AI resources. The observation of low AI readiness aligns with earlier research (Andrada et al., 2023; Walia and Kumar, 2022; Zhu et al., 2020), suggesting a need for targeted staff AI literacy training designed for effective integration of AI into education, especially TPK-related areas, such as employability development, teaching and learning, and academic integrity.

As one of the pioneering studies to delve into the perceived advantages and hurdles of employing AI in education from the staff's perspective, this research uncovers seven main themes of concerns among staff, chiefly the lack of clear policies. Clear guidelines are crucial to ease AI adoption resistance and to maximise AI's educational potential.

References

Celik, I. (2023). Towards Intelligent-TPACK: An empirical study on teachers' professional knowledge to ethically integrate artificial intelligence (AI)-based tools into education. *Computers in Human Behavior*, *138*, 107468.

Chan, C. K. Y., & Hu, W. (2023). Students' voices on generative AI: Perceptions, benefits, and challenges in higher education. *International Journal of Educational Technology in Higher Education*, *20*(1), 43.

Essien, A., Bukoye, O. T., O'Dea, X., and Kremantzis, M. (2024). The influence of ai text generators on critical thinking skills in UK business schools. *Studies in Higher Education*, pages 1–18.

Koehler, M. J., & Mishra, P. (2005). What happens when teachers design educational technology? The development of technological pedagogical content knowledge. *Journal of Educational Computing research*, *32*(2), 131-152.

Luckin, R., Cukurova, M., Kent, C., & du Boulay, B. (2022). Empowering educators to be AI-ready. *Computers and Education: Artificial Intelligence*, *3*, 100076.

Niess, M. L. (2005). Preparing teachers to teach science and mathematics with technology: Developing a technology pedagogical content knowledge. *Teaching and Teacher Education*, *21*(5), 509-523.

Russell Group (2023). *Russell Group principles on the use of generative ai tools in education*. https://russellgroup.ac.uk/news/new-principles-on-use-of-ai-in-education/. Accessed: 2024-03-13.

Southworth, J., Migliaccio, K., Glover, J., Reed, D., McCarty, C., Brendemuhl, J., & Thomas, A. (2023). Developing a model for AI Across the curriculum: Transforming the higher education landscape via innovation in AI literacy. *Computers and Education: Artificial Intelligence*, *4*, 100127.

Zhou, X., Z. J. and Chen, C. (2024). Unveiling students' experiences and perceptions of artificial intelligence usage in higher education. *Journal of University Teaching and Learning Practice* (accepted).

Celik, I. (2023). Towards Intelligent-TPACK: An empirical study on teachers' professional knowledge to ethically integrate artificial intelligence (AI)-based tools into education. *Computers in Human Behavior*, *138*, 107468.

Chan, C. K. Y., & Hu, W. (2023). Students' voices on generative AI: Perceptions, benefits, and challenges in higher education. *International Journal of Educational Technology in Higher Education*, *20*(1), 43.

Essien, A., Bukoye, O. T., O'Dea, X., and Kremantzis, M. (2024). The influence of ai text generators on critical thinking skills in UK business schools. *Studies in Higher Education*, pages 1–18.

Koehler, M. J., & Mishra, P. (2005). What happens when teachers design educational technology? The development of technological pedagogical content knowledge. *Journal of Educational Computing research*, *32*(2), 131-152.

Luckin, R., Cukurova, M., Kent, C., & du Boulay, B. (2022). Empowering educators to be AI-ready. *Computers and Education: Artificial Intelligence*, *3*, 100076.

Niess, M. L. (2005). Preparing teachers to teach science and mathematics with technology: Developing a technology pedagogical content knowledge. *Teaching and Teacher Education*, *21*(5), 509-523.

Russell Group (2023). *Russell Group principles on the use of generative ai tools in education*. https://russellgroup.ac.uk/news/new-principles-on-use-of-ai-in-education/. Accessed: 2024-03-13.

Southworth, J., Migliaccio, K., Glover, J., Reed, D., McCarty, C., Brendemuhl, J., & Thomas, A. (2023). Developing a model for AI Across the curriculum: Transforming the higher education landscape via innovation in AI literacy. *Computers and Education: Artificial Intelligence*, *4*, 100127.

Zhou, X., Z. J. and Chen, C. (2024). Unveiling students' experiences and perceptions of artificial intelligence usage in higher education. Journal of University Teaching and Practice (accepted).