TMP UNIVERSAL JOURNAL OF RESEARCH AND REVIEW ARCHIVES

VOLUME 3 | ISSUE 4 | YEAR 2024 | OCT_DEC 2024

RECEIVED DATE	ACCEPTED DATE	PUBLISHED DATE
02/10/2024	30/10/2024	10/11/2024

Article Type: Research Article

Available online: www.tmp.twistingmemoirs.com

ISSN 2583-7214

THE ADOPTION OF ARTIFICIAL INTELLIGENCE IN HIGHER EDUCATION: A QUANTITATIVE ANALYSIS USING STRUCTURAL EQUATION MODELING

[*1]Seyed Mohammad Ali Mostafavi

[1]PhD, Department of Educational Management, Faculty of Management, Khwarazmi University, Tehran, Iran

Corresponding Author: Seyed Mohammad Ali Mostafavi

ABSTRACT

Global businesses have actively embraced the digital industry. The education sector also utilizes digital tools to enhance personalized learning and promote equity in education. New frontiers have been established in education through the use of artificial intelligence (AI)-based tools. As the role of AI in education is inevitable, the present research aims to identify the level of awareness in higher education regarding the application and acceptance of AI. This study explores how AI has enhanced their learning experience and impacted faculty engagement in higher education. Using a quantitative research approach and a structural equation model, the factors influencing the acceptance of AI in this field were examined. The findings indicated that the implementation of AI has led to the evolution of robust assessment methods, resulting in increased faculty engagement. This study identified that attitudes, applications, and behavioral intentions play a significant role in influencing work engagement and the acceptance of AI in the higher education system.

Keywords: Artificial Intelligence, Attitude, Behavioral Intention, Education

INTRODUCTION

Artificial intelligence (AI) has become a popular and widely used topic in various fields, including education. In higher education, the integration of artificial intelligence in the learning process increases student participation, improves learning outcomes, and provides personalized learning experiences (Lainjo & Tsmouche,2023). One approach to incorporating artificial intelligence into higher education is through blended learning models that combine traditional education with online learning activities (Chan, 2019). This composition examines the analysis of artificial intelligence in blended learning models in higher education, drawing on relevant sources to provide a comprehensive understanding of the topic. Artificial intelligence plays a vital role in

improving the quality of higher education in different ways (Choi, 2020). Artificial intelligence-based learning methods have been used to evaluate students' performance records, determine their strengths and weaknesses, and provide learning experiences tailored to their individual needs. This approach provides students with a toolkit model to acquire knowledge more effectively with a productive outcome (Aldosari, 2020). Artificial intelligence-based technology such as chatbots, virtual assistants, and adaptive learning systems provide immersive learning experiences that help students explore more complex theories and solutions in a more interactive and meaningful way (Chaudhry et al., 2023; Pradana et al., 2023).

Artificial intelligence-powered chatbots provide immediate and personalized support to learners, addressing their academic and organizational needs, such as answering questions about course materials or providing information on course registration and accessing primary sources. These systems have successfully analyzed data to predict which students are at risk of dropping out or experiencing academic difficulties. This filtering helps faculty and support staff identify at-risk students and provide the support they need to succeed (Wenge, 2021). Artificial intelligence literacy refers to the knowledge and skills needed to understand, use, and evaluate artificial intelligence technologies and their applications (Ng et al., 2021). Developing AI literacy among students is critical as it equips them with the skills to navigate an increasingly AI-driven world and make informed decisions (Zhao et al., 2022). Higher education in the 21st century is rapidly advancing due to progress in technology, globalization, and changing student demographics. With the widespread availability of online learning platforms, universities are increasingly offering courses and programs that can be completed entirely online (Dieguez et al., 2021). This practice allows more students to access higher education and provides more flexibility in their learning process (Neumann et al., 2021). As educational sectors become significantly more diverse, students enroll and learn from a wider range of environments, leading to a greater emphasis on intercultural understanding and citizenship. As the pace of technological change is increasing, universities play a more important role in driving innovation and research (Amornkitpinyo et al., 2021). Employers prefer graduates with specific skills and competencies rather than extensive training. As a result, institutions are shifting toward more skill-based learning models that provide students with practical, job-focused skills (Kocak et al., 2021). Education is identifying multiple ways to meet the needs of stakeholders to improve the quality of higher education (Khan et al., 2022). One of the most promising solutions to increase education is through the implementation of artificial intelligence (AI) (Chedrawi & Howayeck, 2019). The future of artificial intelligence in education is very promising, as technology is achieving great change and improvement in the way of learning and teaching (Mishra, 2019).

Artificial intelligence significantly improves the performance and engagement of faculty in higher education. As educational staff in higher education play a crucial role in administrative and academic affairs and are fully engaged in supervisory, accreditation, and other important activities, the acceptance of artificial intelligence can help faculty in automating administrative tasks, such as grading assignments, tracking attendance, and providing student feedback, among others (Bison et al., 2021). AI also helps professors identify areas where they can improve their teaching skills and have opportunities for professional development. For example, AI-based coaching tools provide professors with feedback on their teaching performance and suggest areas for improvement (Minkwicz & Kampers, 2021). The blended learning model combines face-to-face instruction with online learning activities and creates a flexible and interactive learning environment. This model enables a personalized learning experience, as students can quickly engage with the subject and receive immediate feedback. Blended learning also improves active learning, encourages students to collaborate, and improves critical thinking and problem-solving skills (Chan, 2019; Della Fadhilatunisa et al., 2020). Integrating artificial intelligence into the blended learning model offers numerous opportunities to enhance the learning experience in higher education. Artificial intelligence technologies can be used to personalize learning by adapting teaching materials and assessments to students' needs and preferences (Popnici and Kerr,

2017). Ethical considerations related to artificial intelligence literacy in blended learning models have also been investigated. A study examined ethical issues related to artificial intelligence in education and emphasized the importance of educating students about the ethical implications of artificial intelligence technologies. This study suggested incorporating ethical discussions and case studies into the curriculum to promote ethical AI literacy among students (Ng et al., 2021).

AI algorithms have the ability to analyze individual learning patterns, allowing lessons to be tailored to suit different preferences. The findings of this research help organizational policy makers to understand how to understand the adoption of new technology in higher education and enable them to provide the necessary infrastructure and training to overcome specific challenges.

Background

The contribution of appropriate models, research techniques and language skills, particularly in reading, writing and vocabulary acquisition, are the main areas of focus in this issue. All natural language processing (NLP) systems that help develop critical skills related to educational environments, such as self-reflection, answering difficult questions, problem solving, and decision-making abilities, are supported by artificial intelligence (Sandu & Gide, 2019). The main elements that may influence the adoption of AI are: learning anxiety, desire to connect, knowledge acquisition and classroom interaction. The individual characteristics of the participants, such as their capacity for critical thinking and the capacity to solve complex problems, may serve as an added value for the adoption of artificial intelligence (AI). Artificial intelligence will have an immediate impact on decision makers in higher education institutions (Chatterjee & Bhattacharjee, 2020; Liang et al., 2021; Liu et al., 2021; Tyson & Sauers, 2021). According to studies, when (AI) is used well in educational contexts, public attitudes towards the use of these programs change. As their learning styles and techniques increase in how and when they learn, effectiveness in use and implementation may influence faculty and student opinions.

One of the most important elements promoting the adoption of AI at the higher education level is the enthusiasm of the people who make up the sample to launch the user experience and create a structured organization. Adoption of this innovation may accelerate due to the benefits of AI technology. According to studies, perceived usefulness and ease of use may have a positive and significant effect on acceptance (Liu et al., 2021).

Development of hypotheses and conceptual model

Artificial intelligence is increasingly integrated into various sectors, including higher education.

The Technology Acceptance Model (TAM) by Davis (1989) and the Unified Theory of Technology Acceptance and Use (UTAUT) developed by Venkatesh et al (2003). Sohn & Kwonin (2020) proposed a theoretical framework that shows the influence of facilitating conditions, awareness, perceived risk, perceived expectation, effort expectation, acceptance of artificial intelligence in society on attitude and behavior, which in turn leads to work engagement. And the use of artificial intelligence in higher education is progressing. Both TAM and UTAUT theoretical models describe and predict variables that influence user acceptance and use of information technology.

TAM suggests that users' adaptation and use of technology is influenced by users' perceptions of its usefulness and ease of use (Dulle & Minishi-Majanja, 2011). This model provides a useful framework for understanding the factors that influence the adoption and use of AI technologies in higher education (Popenici & Kerr, 2017). By identifying key factors influencing adoption and use, TAM can help inform the design and implementation of AI technologies that are more likely to be adopted and used effectively by faculty and students.

Similarly, UTAUT is an extension of the earlier Technology Acceptance Model (TAM) and includes additional factors that influence user behavior. UTAUT suggests four factors that significantly influence user acceptance and use of technology (Williams et al., 2009). An individual's performance expectation is such that they believe that the use of technology will increase their job performance. Effort expectancy focuses on the degree of ease associated with using technology (Sanusi, 2022). Similarly, social influence is the degree to which one perceives that others believe they should use the technology, and finally, facilitating conditions are the degree to which one believes that technical support and resources are available to support technology use Mohamed Zabri et al., 2023).

Table 1. Overview of previous studies on artificial intelligence in higher education

Reference	Title	Target Group	Method	Purpose
[30]	How to teach responsible AI in Higher Education: challenges and opportunities	For the coaches and for the incentives of this solution	A review of approaches	Challenges and opportunities in how to teach responsibility with artificial intelligence in higher education
[31]	Generative AI in higher education and beyond. *Business Horizons*	Higher education	Empirical	relationship between education and application of skills in higher education
[32]	Artificial intelligence potential in higher education institutions enhanced learning environment in Romania and Serbia	Faculty	interview	Application of artificial intelligence and learning environment
[33]	Artificial intelligence, Machine learning and extended reality: Potential problem solvers for higher education issues	Higher education institutions	Empirical	The impact of artificial intelligence on curriculum design and future orientation
[34]	Artificial intelligence in higher education: the state of the field	Higher education institutions	Empirical	Application of artificial intelligence and learning environment

Attitude (ATT)

Emotions are displayed by people to perform a behavior with a positive or negative goal. This feeling covers the attitude (Fishbein and Ajzen, 1975). Davis et al. (1989) in this theory of technology acceptance model (TAM) assumes that behavioral intention (BI) is evaluated by the individual's attitude towards using a system. Attitude (ATT) affects users' behavioral intention (BI) (Ajzen, 1991) as found in the theory of planned behavior (TPB). Attitude (ATT) acts as a strong mediating variable to interpret the behavioral intention (BI) (Aboelmaged, 2010, Cox, 2012).

H1: People's attitude (ATT) in adopting artificial intelligence in higher education has a positive and significant effect on users' behavioral intention (BI).

H2: Facility conditions (FC) significantly affect users' attitudes in adopting artificial intelligence in higher education.

H3: Awareness (AW) significantly affects attitude towards AI adoption in higher education.

Applications of artificial intelligence in higher education

The introduction of a digital learning approach changed the landscape of the higher education system (Khaza and Empongos, 2022). One of the primary applications of artificial intelligence in higher education is to improve the learning experience for students (Ge & Hu, 2020). Furthermore, (Chang et al., 2022; Kelly et al., 2023), identified how the adoption of artificial intelligence has changed society's view of education.

H4: Acceptance of Artificial Intelligence by Faculties (APP) for society has a significant effect on the attitude towards the use of Artificial Intelligence in higher education.

Behavioral Intention (BI) and Adoption of Artificial Intelligence (AI) in Higher Education

Behavioral intention (BI) is associated with the feeling of evaluating a person's intention to perform a specific behavior (Fishbein and Agen 1975). This behavioral intention (BI) is an effective predictor of performing the actual activities in which the intention is expressed Zhang and Guterrez, 2007). BI acts here as a mediating variable that effectively affects the performance of behavior in favor of that activity to which a person's intention is expressed (Nasrallah, 2014). Judging from this important point of view, the following hypothesis is formulated.

H5: Users' behavioral intention (BI) to adopt artificial intelligence in higher education has a positive and significant effect on the adoption of artificial intelligence in higher education (AI).

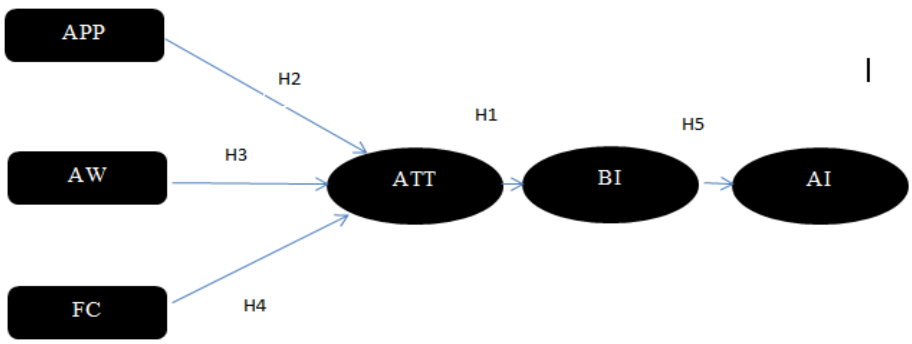

Figure 1. Conceptual model

Structural Equation Modeling (SEM)

The relationship between latent variables is evaluated with the help of SEM. SEM checks whether the structure of the model is regular and correct. It also helps to check whether the structure was able to display the data or not. The results are shown in Table 2.

Table 2. Cronbach's α, VIF and AV estimates

Item.No	VIF	A	AVE	AI	BI	ATT	FC	AW	APP	
4	3.7	0.892	0.797						**0.893**	APP
5	3.9	0.901	0.825					**0.909**	0.533	AW
5	4.1	0.876	0.830				**0.912**	0.534	0.502	FC
5	4.0	0.912	0.832			**0.919**	0.545	0.556	0.513	ATT
4	4.4	0.896	0.841		**0.917**	0.508	0.534	0.515	0.505	BI
5	4.4	0.910	0.854	**0.910**	0.506	0.511	0.562	0.556	0.598	AI

Table 3. Summary of the appropriate model related to the research model

value in the model	Recommended amount	Fit index
2.016	≤ 3.000)Kline،2005(	Chi-Square (χ2)/Degree of Freedom (df(
0.907	≥ 0.900) Hoyle،1995(	Goodness of Fit Index (GFI)
0.842	(1993,Segars and Grover)≥ 0.800	Adjusted Goodness of Fit Index (AGFI)
0.957	(Hair et,2006)≥ 0.930	Comparative Fit Index (CFI)
0.962	≥ 0.950 (Sharma et,2005)	Tucker Lewis index (TLI)

1. (APP) and (AE) have a significant effect on the attitude (ATT) of stakeholders of higher education institutions to adopt artificial intelligence.

2. The condition (FC) has a positive and significant effect on the attitude (ATT) of stakeholders of higher education institutions to adopt artificial intelligence.

3. Behavioral objective (BI) has a positive and significant effect on the adoption of artificial intelligence in higher education.

CONCLUSION

The current research identified the relationship of significant factors in the use of artificial

intelligence in higher education. This research showed that factors such as attitude (ATT) of people play an important role in accepting artificial intelligence in higher education, artificial intelligence applications in higher education and behavioral intention (BI). The result of the study shows that rapid advances in AI technology have made it easier to implement AI solutions in various industries, including higher education. Based on the hypothesis test, the research realizes the role of artificial intelligence in improving learning and creating motivation. Finally, the result of this study emphasized that the applications of artificial intelligence in higher education, awareness and facility conditions are variables that have the potential to improve the attitude towards the application of new technology in the usual methods of teaching, learning and assessment.

The findings of this study shed light on the transformative effects of rapid advances in AI technology.

REFERENCES

1. Lainjo, B., & Tsmouche, H. (2023). Impact of artificial intelligence on higher learning institutions". International Journal of Education Teaching and Social Sciences, 3(2), 96–113. https://doi.org/10.47747/ijets.v3i2.1028
2. Chan, E. (2019). Blended learning dilemma: teacher education in the confucian heritage culture". Australian Journal of Teacher Education, 36–51. https://doi.org/10.14221/ajte.2018v44n1.3
3. Aldosari, S. A. M. (2020). The future of higher education in the light of artificial intelligence transformations. International Journal of Higher Education, 9(3), 145–151. https://doi.org/10.5430/ ijhe.v9n3p145
4. Choi, K.-S. (2020). Opportunities for higher education of artificial intelligence in korea. International Journal of Engineering Research & Technology, 13(11), 3428–3430.
5. Chaudhry, I. S., Sarwary, S. A. M., El Refae, G. A., & Chabchoub, H. (2023). Time to revisit existing student's performance evaluation approach in higher education sector in a new era of ChatGPT — a case study. Cogent Education, 10(1), 2210461.
6. Pradana, M., Elisa, H. P., & Syarifuddin, S. (2023). Discussing ChatGPT in education: A literature review and bibliometric analysis. Cogent Education, 10(2), 2243134.
7. Dieguez, T., Loureiro, P., & Ferreira, I. (2021). Entrepreneurship and leadership in higher education to develop the needed 21st Century skills. In 17th European Conference on Management, Leadership and Governance, ECMLG 2021. Academic Conferences International Limited, pp. 143–151.
8. Neumann, C. Stroud, K. M, Bailey, S, Allison, K, & Everts, S. S. 2021). 21st-century competencies in higher education: A practitioner's guide. In Handbook of research on barriers for teaching 21st-Century competencies and the impact of digitalization. IGI Globalpp. 293–315.
9. Amornkitpinyo, T., Yoosomboon, S, Sopapradit, S, & Amornkitpinyo, P. (2021). The structural equation model of actual use of cloud learning for higher education students in the 21st century. Journal of E-Learning and Knowledge Society, 17(1), 72–80.
10. Kocak, O., Coban, M., Aydin, A., & Cakmak, N. (2021). The mediating role of critical thinking and cooperativity in the 21st century skills of higher education students. Thinking Skills and Creativity 42, 100967.
11. Khan, N., Sarwar, A., Chen, T. B., & Khan, S.(2022). Connecting digital literacy in higher education to the 21st century workforce. Knowledge Management and E-Learning, 14(1), 46–61.
12. Chedrawi, C., & Howayeck, P. (2019). Artificial intelligence a disruptive innovation in higher education accreditation programs: Expert systems and AACSB. Lecture Notes in Information Systems and Organisation, 30, 115–129.

13. Mishra, R. (2019). Usage of data analytics and artificial intelligence in ensuring quality assurance at higher education institutions. In 2019 Amity International Conference on Artificial Intelligence, AICAI 2019. Institute of Electrical and Electronics Engineers Inc. pp. 1022–1025.
14. Bisen, I. E., Arslan, E. A., Yildirim, K., & Yildirim, Y.(2021). Artificial intelligence and machine learning in higher education. In machine learning approaches for improvising modern learning systems (pp. 1–17). IGI Global.
15. Fadhilatunisa, D., Fakhri, M. M., & Rosidah, R. (2020). PENGARUH BLENDED LEARNING TERHADAP AKTIVITAS BELAJAR DAN HASIL BELAJAR MAHASISWA AKUNTANSI. Jurnal Pendidikan Akuntansi Indonesia, 18(2), 93–106. https://doi.org/10.21831/jpai.v18i2.35345
16. Popenici, S., & Kerr, S. (2017). Exploring the impact of artificial intelligence on teaching and learning in higher education". Research and Practice in Technology Enhanced Learning, 12(1), 2017. https://doi.org/10.1186/s41039-017-0062-8.
17. Sandu, N., & Gide, E. (2019). Adoption of AI-Chatbots to enhance student learning experience in higher education in India. 2019 18th International Conference on Information Technology Based Higher Education and Training (ITHET), 1–5.
18. Chatterjee, S., & Bhattacharjee, K. K. (2020). Adoption of artificial intelligence in higher education: A quantitative analysis using structural equation modelling. Education and Information Technologies, 25(5), 3443–3463.
19. Liang, J.-C., Hwang, G.-J., Chen, M.-R. A., & Darmawansah, D. (2021). Roles and research foci of artificial intelligence in language education: an integrated bibliographic analysis and systematic review approach. Interactive Learning Environments, 1–27.
20. Liu, C., Hou, J., Tu, Y.-F., Wang, Y., & Hwang, G.-J. (2021). Incorporating a reflective thinking promoting mechanism into artificial intelligence-supported English writing environments. Interactive Learning Environments, 1–19.
21. Tyson, M. M., & Sauers, N. J. (2021). School leaders' adoption and implementation of artificial intelligence. Journal of Educational Administration.
22. Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of Information technology. MIS Quarterly, 13(3), 319–340. https:// doi.org/10.2307/249008
23. Venkatesh, V. (2003). User acceptance of Information technology: Toward a unified view. MIS Quarterly, 27 (3), 425–478. https://doi.org/10.2307/30036540
24. Sohn, K., & Kwon, O. (2020a). Technology acceptance theories and factors influencing artificial intelligence-based intelligent products. Telematics and Informatics 47, 101324. https://doi.org/10.1016/j. tele.2019.101324
25. Dulle, F. W., & Minishi-Majanja, M. K. (2011). The suitability of the unified theory of acceptance and use of technology (utaut) model in open access adoption studies. Information Development, 27(1), 32–45. https://doi.org/10.1177/0266666910385375
26. Popenici, S. A. D., & Kerr, S. (2017). Exploring the impact of artificial intelligence on teaching and learning in higher education. Research and Practice in Technology Enhanced Learning, 12(1). https://doi.org/ 10.1186/s41039-017-0062-8
27. Williams, M. D., Dwivedi, Y. K., Lal, B., & Schwarz, A. (2009). Contemporary trends and issues in IT adoption and diffusion research. Journal of Information Technology, 24(1), 1–10. https://doi.org/10.1057/jit. 2008.30
28. Sanusi, M. S. (2022). Action research to reassess the acceptance and use of technology in a blended learning approach amongst postgraduate business students. Cogent Education, 9(1), 2145813. https:// doi.org/10.1080/2331186X.2022.2145813
29. Mohamed Zabri, S., Mohammad Abakar, Y., & Ahmad, K. (2023). Exploring the acceptance of online learning among students in technical and non-technical programmes at a higher education institution. Cogent Education, 10(2), 2284552. https://doi.org/10.1080/ 2331186X.2023.2284552

30. Aler Tubella, A., Mora-Cantallops, M., & Nieves, J. C. (2024). How to teach responsible AI in Higher Education: challenges and opportunities. Ethics and Information Technology, 26(1), 3.
31. Hashmi, N., & Bal, A. S. (2024). Generative AI in higher education and beyond. Business Horizons.
32. Bucea-Manea-Țoniș, R., Kuleto, V., Gudei, S. C. D., Lianu, C., Lianu, C., Ilić, M. P., & Păun, D. (2022). Artificial intelligence potential in higher education institutions enhanced learning environment in Romania and Serbia. Sustainability (Switzerland), 14(10), 5842. https://doi.org/10.3390/su14105842
33. Kuleto, V., Mihoreanu, L, Dinu, D. G., Ilić, M. P., & Păun, D. (2023). Artificial intelligence, Machine learning and extended reality: Potential problem solvers for higher education issues. In Springer series on cultural computing (pp. 123–136). Springer Science and Business Media Deutschland GmbH. https://doi.org/10.1007/ 978-3-031-27166-3_7
34. Crompton, H., & Burke, D. (2023). Artificial intelligence in higher education: the state of the field. International Journal of Educational Technology in Higher Education, 20(1), 22.
35. Fishbein, M., & Ajzen, J. (1975). Belief, attitude, intention and behaviour: An introduction to theory and research. Reading: Addison-Wesley Publication Company.
36. Ajzen, J. (1991). The theory of planned behaviour. Organizational Behaviour and Human Decision Processes, 50(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T.
37. Aboelmaged, M. G. (2010). Predicting e-procurement adoption in a developing country: An empirical integration of technology acceptance model and theory of planned behaviour. Industrial Management & Data Systems, 110(3), 392–414. https://doi.org/10.1108/02635571011030042.
38. Cox, J. (2012). Information system users security: A structured model of the knowing-doing gap. Computers in Human Behaviour, 28(5), 1849–1858. https://doi.org/10.1016/j.chb.2012.05.003.
39. Khoza, S. B., & Mpungose, C. B. (2022). Digitalised curriculum to the rescue of a higher education institution. African Identities, 20(4), 310–330. https://doi.org/10. 1080/14725843.2020.1815517
40. Ge, Z., & Hu, Y. (2020) Innovative application of artificial intelligence (AI) in the Management of higher education and teaching. In 2020 International Conference on Artificial Intelligence and Information Technology, ICAIIT 2020. Institute of Physics Publishing. https://doi.org/10.1088/1742-6596/1533/ 3/032089.
41. Chang, Y., Lee, S., Wong, S. F., & Jeong, S.-P. (2022). AIpowered learning application use and gratification: An integrative model. Information Technology & People, 35(7), 2115–2139. https://doi.org/10.1108/ ITP-09-2020-0632
42. Kelly, S., Kaye, S.-A., & Oviedo-Trespalacios, O. (2023). What factors contribute to the acceptance of artificial intelligence? A systematic review. Telematics and Informatics 77, 101925. https://doi.org/10.1016/j.tele. 2022.101925
43. Zhang, W., & Guterrez, O. (2007). Information technology acceptance in the social services sector context: An exploration. Social Work, 52(3), 221–231. https://doi.org/10.1093/sw/52.3.221.
44. Nasrallah, R. (2014). Learning outcomes role in higher education teaching. Education, Business and Society, 7(4), 257–276. https://doi.org/10.1108/EBS-03-2014-0016.
45. Kline, R. B. (2005). Principles and practice of structural equation modeling. New York: Guilford.
46. Hoyle, R. H. (1995). The structural equation modelling approach: Basic concepts and fundamental issues, and applications (pp. 1—15). Thousand Oaks, CA: Sage Publication.
47. Segars, A. H., & Grover, V. (1993). Re-examining perceived ease of use and usefulness: A confirmatory factor analysis. MIS Quarterly, 17(4), 517–525. https://doi.org/10.2307/249590.

48. Hair, J., Black, W., Babin, B., Anderson, R., & Tatham, R. (2006). Multivariate Data Analysis (6th ed.). Pearson: Prentice Hall, New Jersey, USA.
49. Sharma, S., Mukherjee, S., Kumar, A., & Dillon, W. R. (2005). A simulation study to investigate the use of cutoff values for assessing model fit in covariance structure models. Journal of Business Research, 58(7), 935–943. https://doi.org/10.1016/j.jbusres.2003.10.007.