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EMBRACING AI IN EDUCATION: INDONESIAN UNIVERSITY STUDENTS' PERSPECTIVES ON OPPORTUNITIES AND CONCERNS

Buana Dwi
Binus University, Indonesia

Bassey, Pius John
University of Uyo, Nigeria

Abstract
The rapid advancement of Artificial Intelligence (AI) technology has created new opportunities for transforming educational delivery and learning experiences. Understanding students' perspectives on AI's integration in education is essential to navigating its potential benefits and challenges. This study investigates the perceptions of university students in Indonesia regarding the use of AI in educational settings. A quantitative descriptive survey was conducted with 200 students from the Faculty of Teacher Training and Education at Bengkulu University, utilizing a perception scale adapted from Buabbas et al. (2023). Data analysis included descriptive statistics and the Chi-Square test. The results revealed that the majority of students hold positive views on AI's role in education, recognizing its potential to enhance learning experiences and broaden access to educational resources. However, several concerns were raised, particularly regarding the potential replacement of teachers by AI, the diminished human interaction in learning processes, and issues surrounding data privacy and security. These findings highlight the dual nature of students' perceptions: while they appreciate AI's ability to augment education, there is a prevailing concern over the loss of essential human elements in teaching and the implications for personal privacy. The study concludes that, while AI offers significant promise in reshaping education, its implementation must be approached with caution. A human-centered strategy that emphasizes the complementary role of teachers, along with stringent protections for student data privacy, is necessary. Further research is recommended to deepen understanding of AI's long-term impacts on the educational experience.

Keywords Artificial Intelligence (AI) technology, educational delivery, learning experiences.

INTRODUCTION

Artificial Intelligence (AI) has become an integral part of modern education, reshaping traditional learning environments and offering new possibilities for both teachers and students (Holmes et al., 2021; Luckin, 2017). Beyond automating routine tasks, AI provides intelligent systems capable of analyzing student behavior and delivering personalized learning experiences (Siemens, 2020; Zhu et al., 2019). In this context, AI-powered platforms can tailor instruction to individual needs, offering real-time feedback and adapting content to different learning styles (Johnson et al., 2022; Watson & Watson, 2019). Such adaptive models present opportunities for enhancing engagement and improving academic outcomes by catering to diverse educational requirements (West, 2018; Kleanthous et al., 2021).

However, the widespread implementation of AI in education also raises important ethical and practical challenges. Issues related to data privacy, algorithmic transparency, and potential biases in AI-driven systems are increasingly being scrutinized (Baker & Williamson, 2022; Crawford, 2021). There is concern over the dehumanization of learning, as well as the risks of over-reliance on technology at the expense of teacher-student interactions (Selwyn, 2020; Williamson, 2023). Additionally, the unequal access to AI technologies can exacerbate existing educational disparities (Livingstone & Sefton-Green, 2020).

This article examines the complexities surrounding AI's role in education, with a focus on balancing innovation with ethical considerations. It explores strategies to ensure AI systems are developed and used responsibly, promoting equity, safeguarding privacy, and supporting human-centered learning experiences.

Artificial Intelligence (AI) presents significant potential to reshape education by identifying individual student needs and customizing instructional methods to address them, thereby contributing to reducing disparities in educational outcomes and promoting equity (Lu, 2019). AI's ability to provide real-time feedback can greatly enhance student engagement and active participation in the learning process (Kerr, 2004). By adapting to each student's unique learning preferences and pace, AI fosters a more inclusive and flexible learning environment. This personalized approach accommodates diverse learning styles, ensuring that students can interact with content in ways that align with their strengths and habits.

Additionally, AI's application extends beyond traditional classroom settings (Cope, Kalantzis, & Searsmith, 2021; Srinivasa, Kurni, & Saritha, 2022; Timms, 2016). AI-driven technologies empower online and remote learning platforms to deliver tailored instruction, resources, and feedback, thereby expanding educational access to students in various geographic locations. This technological advancement enhances inclusivity, providing equitable learning opportunities, particularly in regions with limited educational infrastructure.

However, the integration of AI in education requires careful ethical management. Safeguarding data privacy, addressing potential biases in AI algorithms, and ensuring transparency in decision-making processes are paramount. Adhering to ethical guidelines in the use of AI in educational contexts is essential to preserving the integrity of the learning experience and upholding the rights and well-being of students. Proper stewardship ensures that AI serves as a beneficial tool while maintaining trust in its application.

Numerous studies have explored the benefits of AI-based personalized learning, offering empirical evidence of its positive effects on student engagement, academic achievement, and self-directed learning. Research also highlights AI's potential to enhance online learning environments through personalized instruction. The tailored nature of AI-driven learning promotes self-regulated learning and fosters the development of student autonomy and metacognitive skills (Tang, Chang, & Hwang, 2021). By adapting instructional content to meet individual student needs, AI accommodates varying learning styles and paces, creating a more inclusive and supportive educational experience.

A key advantage of AI-driven personalized learning is the provision of real-time feedback, which helps to identify and address learning gaps promptly, thereby improving students' understanding and mastery of material. This continuous feedback loop contributes to a dynamic and responsive learning environment (Brock et al., 2008; Yesilyurt, 2023). Furthermore, AI's impact extends beyond traditional academic subjects, as it

facilitates the development of essential 21st-century skills such as critical thinking, problem-solving, and collaboration. By customizing learning experiences to each student's strengths and weaknesses, AI supports a holistic approach to education, preparing students for the demands of the modern workforce.

Despite these promising aspects, it is crucial to address the ethical concerns associated with AI in education, including data privacy, algorithmic bias, and transparency. Research on medical students by Buabbas et al. (2023) shows a favorable view of AI's role in healthcare, underscoring the need for similar investigations in education, particularly in Indonesia. As AI becomes increasingly integrated into education, further research is essential to ensure that its benefits are equitably distributed and that ethical concerns are effectively managed.

Ethical and cultural differences across countries lead to varying perspectives on the use of Artificial Intelligence (AI) in education. As AI adoption in Indonesia expands, students must prepare for the technological shifts affecting education-related careers. However, AI's use in education poses certain risks, including the potential reinforcement of biases present in data and algorithms (Wang, 2021). Researchers recommend that educators pay closer attention to AI's impact on learning outcomes and develop strategies to mitigate these negative effects. AI can perpetuate biases from its training data, which may result in unfair or discriminatory decisions. Thus, it is critical to assess the data used in AI models carefully and implement measures to minimize bias.

Educators and researchers should also stay informed about AI advancements to ensure its ethical and transparent use in education (Luckin & Holmes, 2016; Pedro et al., 2019). Establishing clear guidelines for AI's integration into educational settings can help safeguard students' rights and enhance their learning experience. It is equally important to involve stakeholders, including students, in the development and deployment of AI technologies (Bhimdiwala, Neri, & Gomez, 2021; Chiu & Chai, 2020). In doing so, a deeper understanding of AI's impact on various groups can be achieved, and strategies to maximize its benefits while mitigating risks can be identified.

Critics have expressed concerns regarding AI in education, particularly around the potential loss of human elements in learning, data privacy, bias, and an over-reliance on technology (Mikelsten et al., 2022; Rensfeldt & Rahm, 2023). This study seeks to examine these issues by addressing two key questions: (1) What is the level of student perception about AI in education? and (2) How prepared are students to apply AI in educational contexts?

METHOD

This study employed a quantitative descriptive survey design, chosen for its effectiveness in gathering data from a large number of respondents and providing an accurate representation of students' perceptions of artificial intelligence (AI) in education. The sample consisted of 200 students from the Faculty of Teacher Training and Education at Bengkulu University, selected from the 2nd, 4th, 6th, and 8th semesters to capture a comprehensive view of student perceptions across different stages of study. Snowball sampling was utilized, and data collection occurred over a fourteen-day period. Participants were informed of the study's objectives and procedures, and their informed consent was obtained prior to participation.

The research instrument, a modified version of a student perception questionnaire originally developed by Buabbas et al. (2023) for medical education, was adapted to the context of teacher education through focus group discussions (FGDs). The questionnaire, comprising 15 items, included 10 items on student perceptions of AI, such as

"Artificial intelligence (AI) will play an important role in education," and 5 items on the impact of AI on teacher education, including "AI will replace my future role as Teacher." A back-translation process ensured the accuracy and relevance of the adapted instrument.

The validity and reliability of the questionnaire were assessed, with Cronbach's Alpha values of 0.755 for the perception scale and 0.635 for the impact scale, both indicating acceptable reliability. Data were collected via an online questionnaire distributed through Google Forms, with responses analyzed using descriptive statistics, including relative frequencies and percentages, to identify trends in student perceptions and the impacts of AI on education. Ethical guidelines were strictly followed, ensuring informed consent, participant privacy, and data confidentiality.

Findings

The results of the data analysis are presented in Table 1, which outlines students' perceptions of the role of AI in education. Each statement in the table is assigned an average score and corresponding percentage, allowing for the categorization of perceptions into three distinct levels: "Medium," "Low," or "High." This categorization facilitates a clearer understanding of the overall sentiment students hold towards AI in education, enabling the identification of specific areas where AI is viewed more favorably or where concerns may exist. The use of both average scores and percentages provides a nuanced depiction of student perspectives, offering valuable insights into the varying degrees of acceptance and apprehension regarding AI's integration into educational settings.

Table 1: Students' Perceptions About the Role of AI in Education

No	Statement	Average	%	Category
1	AI will play an essential role in education	3.605	0.54075	Medium
2	AI will replace some specializations in educational work	3.69	0.5535	Medium
3	I understand the basic principles of AI	1.325	0.19875	Low
4	I am comfortable with AI terminology	3.44	0.516	Medium
5	I understand the limitations of AI	3.33	0.4995	Medium
6	The presence of AI will benefit my work as a student	4.265	0.63975	Medium
7	All students should accept the development of AI	3.485	0.52275	Medium
8	I will be confident using AI for my assignment needs	3.415	0.51225	Medium
9	I will have a better understanding when using AI	3.715	0.55725	Medium
10	AI systems will have a positive impact on the world of education	3.57	0.5355	Medium
11	Incorporating AI into the lecture system will facilitate the learning process	3.18	0.477	Medium
12	Using AI in education will prepare me to be skilled in lecture practices	3.38	0.507	Medium
13	AI will replace my future role as a Teacher	3.545	0.53175	Medium
14	Willingness to use AI in education	3.09	0.4635	Medium
15	The use of AI should be maximized in assisting educational work	3.655	0.54825	Medium

The descriptive statistical analysis reveals that students' perceptions of AI in education are predominantly classified within the medium category. This suggests that while there is general agreement on the applicability of AI in educational

contexts, students' views on its development and integration remain moderate. The data indicates that students are receptive to the role of AI in education, but their overall sentiment is neither strongly positive nor negative.

Table 2 provides a detailed breakdown of students' perceptions of AI. It shows that a significant majority, 76 students (38%), agree that AI will play a crucial role in education. Furthermore, more than half of the respondents, comprising 102 students (51%), believe that AI will eventually replace certain roles within educational professions. However, there is a notable gap in understanding AI's fundamental computational principles, with 135 students (67.5%) acknowledging a lack of comprehensive knowledge in this area. These findings underscore both the acceptance of AI's potential impact and the need for improved education on AI technologies among students.

Table 2: Perceptions Towards Artificial Intelligence (n=200)

Statement	Strongly Agree	Agree	Somewhat Agree	Disagree	Strongly Disagree
AI will play an essential role in education	35 (17.5%)	76 (38%)	68 (34%)	17 (8.5%)	4 (2%)
AI will replace some specializations in educational work	32 (16%)	103 (51%)	45 (22.5%)	14 (7%)	7 (3.5%)
I understand the basic principles of AI	0	0	0	65 (32.5%)	135 (67.5%)
I am comfortable with AI terminology	34 (17%)	54 (27%)	81 (40.5%)	28 (14%)	3 (1.5%)
I understand the limitations of AI	17 (8.5%)	65 (32.5%)	89 (44.5%)	25 (12.5%)	4 (2%)
The presence of AI will benefit my work as a student	92 (46%)	74 (37%)	29 (14.5%)	5 (2.5%)	0
All students should accept the development of AI	30 (15%)	71 (35.5%)	69 (34.5%)	26 (13%)	4 (2%)
I will be confident using AI for my assignment needs	37 (18.5%)	48 (24%)	79 (39.5%)	33 (16.5%)	3 (1.5%)
I will have a better understanding when using AI	52 (26%)	60 (30%)	71 (35.5%)	13 (6.5%)	4 (2%)
AI systems will have a positive impact on the world of education	31 (15.5%)	76 (38%)	72 (36%)	18 (9%)	3 (1.5%)

Table 3 illustrates student perspectives on the impact of AI in education and their readiness to adopt it. The data indicates that a notable proportion, 70 students (35%), somewhat agree that AI systems can positively influence education by enhancing learning processes and better preparing students for practical applications. In contrast, a majority of students, 81 (78.7%), do not believe that AI will replace teachers in the foreseeable future. Additionally, there is a strong willingness among students to incorporate AI into their educational experiences, with 76 students (38%) expressing a keen interest in engaging with AI technologies. This table highlights a general acceptance of AI's potential benefits while also revealing skepticism regarding its potential to replace traditional teaching roles.

Table 3: Impact of Artificial Intelligence and Readiness to Use (n=200)

Statement	Strongly Agree	Agree	Somewhat Agree	Disagree	Strongly Disagree
Incorporating AI into the lecture system will facilitate the learning process	24 (12%)	55 (27.5%)	70 (35%)	35 (17.5%)	16 (8%)
Using AI in education will prepare me to be skilled in lecture practices	34 (17%)	57 (28.5%)	71 (35.5%)	27 (13.5%)	11 (5.5%)
AI will replace my future role as a Teacher	29 (14.5%)	81 (40.5%)	62 (31%)	26 (13%)	2 (1%)
Willingness to use AI in education	18 (9%)	45 (22.5%)	84 (42%)	43 (21.5%)	10 (5%)
The use of AI should be maximized in assisting educational work	36 (18%)	76 (38%)	74 (37%)	11 (5.5%)	3 (1.5%)

The results reveal that students hold a range of perceptions regarding the use of AI in education. While many students recognize the potential benefits of AI in enhancing educational experiences, there are notable concerns and uncertainties about its future impact on both education and their roles as students or educators. Although there is general enthusiasm for AI's integration into learning, significant apprehensions remain.

A primary concern highlighted by the survey is the potential for AI to replace traditional teaching roles. Students expressed worries about the erosion of human elements in learning interactions due to the increasing dominance of technology. Additionally, issues related to data privacy emerged as a significant concern, with students expressing awareness of the risks associated with the use of AI technology in handling personal information.

These findings underscore the need for careful consideration in implementing AI within educational settings. It is essential to strike a balance between harnessing AI's capabilities for educational advancement and preserving fundamental human values in teaching and learning. Consequently, there is a pressing need for the development of robust policies and ethical guidelines that address these concerns to ensure the responsible and sustainable integration of AI technology in education.

DISCUSSION

The analysis of student perceptions regarding artificial intelligence (AI) in education reveals a generally moderate level of approval. Descriptive statistical analysis indicates that most students support the application of AI in educational contexts, with their views on AI's development in education also falling within a moderate range. This suggests that while students recognize the potential benefits of AI, their attitudes are neither extremely positive nor negative, but rather positioned in a balanced middle ground.

The moderate perception highlights students' acceptance of AI technology in education, indicating a willingness to embrace its integration. However, the balanced nature of these views points to a cautious optimism rather than unreserved enthusiasm. This insight is crucial for designing AI implementation strategies that address student perspectives and concerns comprehensively.

The findings underscore AI's growing influence on the educational landscape and its potential to transform traditional teaching methods. Proponents argue that AI can offer personalized

learning experiences, addressing individual needs and bridging gaps in educational opportunities (Goksel & Bozkurt, 2019). Conversely, critics warn that AI could reinforce existing social and economic inequalities if not carefully designed, as it may perpetuate biases present in data and algorithms (Remian, 2019).

Overall, while AI holds the promise of significant advancements in education, it is essential to navigate its integration thoughtfully. The evidence indicates that AI has already begun to impact the education sector positively, but careful consideration is required to ensure it contributes to equitable and effective educational outcomes (Brougham & Haar, 2018; Chatterjee, Sreenivasulu, & Hussain, 2021; Kelley et al., 2018).

The survey results reveal that the majority of students have a medium level of perception regarding the use of artificial intelligence (AI) in education. This moderate stance reflects a neutral or ambivalent attitude towards AI integration in educational settings, aligning with findings from similar studies that report moderate student receptivity to AI in education (Bhandari et al., 2021; Mousavi Baigi et al., 2023; Santomartino & Paul, 2022).

A significant observation is the disparity in students' understanding of basic AI principles compared to findings from a study conducted in Kuwait by Buabbas et al. (2023). Specifically, Statement item 3, which assesses students' grasp of AI fundamentals, reveals that comprehension remains notably low among Indonesian students. This contrasts with the higher understanding reported among medical students at Kuwait University.

Several factors may account for these perceptual differences. Regional variations in education quality and technological exposure significantly influence these disparities. Students in Kuwait likely benefit from greater AI exposure through advanced curricular integration and practical experiences, supported by the country's sophisticated technological infrastructure. In contrast, Indonesian students face challenges such as limited access to technology, a less comprehensive AI curriculum, and lower overall technology awareness, which may hinder their understanding of AI principles.

Cultural and public awareness factors also play a crucial role in shaping students' perceptions of AI. In Kuwait, higher societal acceptance and cultural support for AI may contribute to a deeper understanding and greater acceptance of the technology. Conversely, in Indonesia, evolving cultural perceptions and limited public awareness necessitate efforts to enhance understanding and acceptance of AI technologies.

Infrastructure differences further exacerbate these variations. Kuwait's advanced infrastructure, particularly in telecommunications and key economic sectors, facilitates broader technology adoption. Conversely, Indonesia's developing infrastructure may impact the speed and extent of technology integration in education and other sectors.

The findings regarding students' preparedness to apply artificial intelligence (AI) in education reveal considerable variation in their readiness levels. While some students feel sufficiently prepared to integrate AI technology into their learning processes, others express the need for additional preparation. These differing levels of readiness are influenced by a range of factors, including the students' existing knowledge of AI, their technological skills, and their willingness to adopt AI as a supportive educational tool. Additionally, concerns about the social impact and ethical implications of AI use may also affect students' readiness to engage with this technology.

Students with a solid understanding of AI technology and positive experiences with its

applications tend to exhibit greater readiness and enthusiasm for using AI in education (Bhandari et al., 2021; Kerr, 2004). Conversely, those lacking in AI literacy or with negative experiences may feel less prepared. Social and cultural factors, including societal norms and individual preferences, also play a significant role in shaping students' perceptions and readiness (Bhandari et al., 2021).

Understanding these perceptions is crucial for designing effective AI integration strategies. Some students view AI as a valuable tool for enhancing learning efficiency and effectiveness, while others express concerns about the potential displacement of teachers and the loss of human elements in education (Brougham & Haar, 2018; Chatterjee et al., 2021). These concerns highlight the importance of addressing ethical and legal issues related to AI use, such as data privacy, security, and the potential impact on educational roles and societal norms (Avella et al., 2016; Remian, 2019; Kukulska-Hulme, 2012).

To foster a more informed and supportive adoption of AI in education, it is essential to address students' concerns and enhance their technological literacy. By doing so, educators and policymakers can develop more responsive and sustainable AI applications that align with students' needs and expectations.

CONCLUSION

Artificial Intelligence (AI) is increasingly integral to contemporary education, offering significant potential to enhance efficiency, personalization, and overall educational quality. The findings of this study indicate that a majority of students hold a positive view of AI's role in learning, recognizing it as a valuable tool for enriching their educational experience and broadening access to resources. Nonetheless, the study also highlights students' concerns regarding the potential replacement of teachers by AI, the erosion of human elements in educational interactions, and issues related to data privacy. These concerns underscore the necessity for educators and technology developers to adopt a human-centered approach in implementing AI in education. This approach should ensure that AI complements rather than replaces the role of teachers and that it upholds stringent standards for privacy and data security. While AI holds substantial promise for transforming education in advantageous ways, it is essential to proceed with caution, prioritizing the needs and perspectives of students. The study recommends that efforts be intensified to enhance understanding of AI and its judicious use within educational settings, in alignment with existing academic standards. Furthermore, conducting comparative research between students who are exposed to AI and those who are not is essential to provide a more comprehensive understanding of AI's impacts and benefits in education.

REFERENCES

1. Abivian, M. (2022). Gambaran Perilaku Phubbing dan Pengaruhnya terhadap Remaja pada Era Society 5.0. Prophetic: Professional, Empathy, Islamic Counseling Journal, 5(2), 155–164.
2. Ahmad, T., Zhang, D., Huang, C., Zhang, H., Dai, N., Song, Y., & Chen, H. (2021). Artificial intelligence in sustainable energy industry: Status Quo, challenges and opportunities. Journal of Cleaner Production, 289, 125834.
3. Aoun, J. E. (2017). Robot-proof: higher education in the age of artificial intelligence. MIT press.
4. Avella, J. T., Kebritchi, M., Nunn, S. G., & Kanai, T. (2016). Learning analytics methods, benefits, and challenges in higher education: A systematic literature review. Online Learning, 20(2), 13–29.
5. Bhandari, A., Purchuri, S. N., Sharma, C., Ibrahim, M., & Prior, M. (2021). Knowledge and

attitudes towards artificial intelligence in imaging: a look at the quantitative survey literature. Clinical Imaging, 80, 413–419.

6. Bhimdiwala, A., Neri, R. C., & Gomez, L. M. (2021). Advancing the design and implementation of artificial intelligence in education through continuous improvement. International Journal of Artificial Intelligence in Education, 1–27.
7. Brock, L. L., Nishida, T. K., Chiong, C., Grimm, K. J., & Rimm-Kaufman, S. E. (2008). Children's perceptions of the classroom environment and social and academic performance: A longitudinal analysis of the contribution of the Responsive Classroom approach. Journal of School Psychology, 46(2), 129–149.
8. Brougham, D., & Haar, J. (2018). Smart technology, artificial intelligence, robotics, and algorithms (STARA): Employees' perceptions of our future workplace. Journal of Management & Organization, 24(2), 239–257.
9. Buabbas, A. J., Miskin, B., Alnaqi, A. A., Ayed, A. K., Shehab, A. A., Syed-Abdul, S., & Uddin, M. (2023). Investigating Students' Perceptions towards Artificial Intelligence in Medical Education. Healthcare, 11(9), 1298. MDPI.
10. Chatterjee, S., Sreenivasulu, N. S., & Hussain, Z. (2021). Evolution of artificial intelligence and its impact on human rights: from sociolegal perspective. International Journal of Law and Management, 64(2), 184–205.
11. Chen, L., Chen, P., & Lin, Z. (2020). Artificial intelligence in education: A review. Ieee Access, 8, 75264– 75278.
12. Chen, X., Zou, D., Xie, H., Cheng, G., & Liu, C. (2022). Two decades of artificial intelligence in education. Educational Technology & Society, 25(1), 28–47.
13. Chiu, T. K. F., & Chai, C. (2020). Sustainable curriculum planning for artificial intelligence education: A self-determination theory perspective. Sustainability, 12(14), 5568.
14. Ciolacu, M., Tehrani, A. F., Binder, L., & Svasta, P. M. (2018). Education 4.0-Artificial Intelligence assisted higher education: early recognition system with machine learning to support students' success. 2018 IEEE 24th International Symposium for Design and Technology in Electronic Packaging (SIITME), 23–30. IEEE.
15. Cope, B., Kalantzis, M., & Searsmith, D. (2021). Artificial intelligence for education: Knowledge and its assessment in AI-enabled learning ecologies. Educational Philosophy and Theory, 53(12), 1229–1245.
16. Fitri, D. K., & Irwansyah, I. (2023). SOCIETY 5.0: NOMOPHOBIA DAN KETERGANTUNGAN PADA TEKNOLOGI (SMARTPHONE) SECARA PENGGUNAAN SERTA KOMUNIKASI PADA KALANGAN MASYARAKAT. Jurnal Ilmu Komunikasi Acta Diurna, 19(1), 50–69.
17. Geis, J. R., Brady, A. P., Wu, C. C., Spencer, J., Ranschaert, E., Jaremko, J. L., … Shields, W. F. (2019). Ethics of artificial intelligence in radiology: summary of the joint European and North American multisociety statement. Canadian Association of Radiologists Journal, 70(4), 329–334.
18. Goksel, N., & Bozkurt, A. (2019). Artificial intelligence in education: Current insights and future perspectives. In Handbook of Research on Learning in the Age of Transhumanism (pp. 224–236). IGI Global.
19. Kelley, K. H., Fontanetta, L. M., Heintzman, M., & Pereira, N. (2018). Artificial intelligence: Implications for social inflation and insurance. Risk Management and Insurance Review, 21(3), 373–387.

20. Kerr, D. (2004). Factors influencing the development and adoption of knowledge based decision support systems for small, owner-operated rural business. Artificial Intelligence Review, 22, 127– 147.

21. Korthagen, F. A. J., Attema-Noordewier, S., & Zwart, R. C. (2014). Teacher–student contact: Exploring a basic but complicated concept. Teaching and Teacher Education, 40, 22–32.

22. Kukulska-Hulme, A. (2012). How should the higher education workforce adapt to advancements in technology for teaching and learning? The Internet and Higher Education, 15(4), 247–254.

23. Lu, Y. (2019). Artificial intelligence: a survey on evolution, models, applications and future trends. Journal of Management Analytics, 6(1), 1–29.

24. Luckin, R., & Holmes, W. (2016). Intelligence unleashed: An argument for AI in education.

25. Masters, K. (2023). Ethical use of artificial intelligence in health professions education: AMEE Guide No. 158. Medical Teacher, 1–11.

26. Meng, W., & Sumettikoon, P. (2022). The use of artificial intelligence to enhance teaching effectiveness in vocational education. Eurasian Journal of Educational Research, 98(98), 266–283.

27. Mikelsten, D., Teigens, V., & Skalfist, P. (2022). Kecerdasan Buatan: Revolusi Industri Keempat. Cambridge Stanford Books.

28. Mousavi Baigi, S. F., Sarbaz, M., Ghaddaripouri, K., Ghaddaripouri, M., Mousavi, A. S., & Kimiafar, K. (2023). Attitudes, knowledge, and skills towards artificial intelligence among healthcare students: A systematic review. Health Science Reports, 6(3), e1138.

29. Musa, N., & Ishak, M. S. (2021). the Phenomenon of Google Effect, Digital Amnesia and Nomophobia in Academic Perspective. Cyberspace: Jurnal Pendidikan Teknologi Informasi, 5(1), 1–15.

30. Pedro, F., Subosa, M., Rivas, A., & Valverde, P. (2019). Artificial intelligence in education: Challenges and opportunities for sustainable development.

31. Pianta, R. C., Hamre, B. K., & Allen, J. P. (2012). Teacher-student relationships and engagement: Conceptualizing, measuring, and improving the capacity of classroom interactions. In Handbook of research on student engagement (pp. 365–386). Springer.

32. Remian, D. (2019). Augmenting education: ethical considerations for incorporating artificial intelligence in education.

33. Rensfeldt, A. B., & Rahm, L. (2023). Automating Teacher Work? A History of the Politics of Automation and Artificial Intelligence in Education. Postdigital Science and Education, 5(1), 25–43.

34. Salehi, H., & Burgueño, R. (2018). Emerging artificial intelligence methods in structural engineering. Engineering Structures, 171, 170–189.

35. Santomartino, S. M., & Paul, H. Y. (2022). Systematic review of radiologist and medical student attitudes on the role and impact of AI in radiology. Academic Radiology.

36. Shiohira, K. (2021). Understanding the Impact of Artificial Intelligence on Skills Development. Education 2030. UNESCO-UNEVOC International Centre for Technical and Vocational Education and Training.

37. Srinivasa, K. G., Kurni, M., & Saritha, K. (2022). Harnessing the Power of AI to Education. In Learning, Teaching, and Assessment Methods for Contemporary Learners: Pedagogy for the Digital Generation (pp. 311–342). Springer.

38. Sun, P., & Gu, L. (2021). Fuzzy knowledge graph system for artificial intelligence-based smart education. Journal of Intelligent & Fuzzy Systems, 40(2), 2929–2940.

39. Tang, K.-Y., Chang, C.-Y., & Hwang, G.-J. (2021). Trends in artificial intelligence-supported e-learning: A systematic review and co-citation network analysis (1998–2019). Interactive Learning Environments, 1–19.

40. Timms, M. J. (2016). Letting artificial intelligence in education out of the box: educational cobots and smart classrooms. International Journal of Artificial Intelligence in Education, 26, 701–712.

41. Vermesan, O., Bröring, A., Tragos, E., Serrano, M., Bacciu, D., Chessa, S., … Saffiotti, A. (2017). Internet of robotic things: converging sensing/actuating, hypoconnectivity, artificial intelligence and IoT Platforms.

42. Wang, Y. (2021). When artificial intelligence meets educational leaders' data-informed decision-making: A cautionary tale. Studies in Educational Evaluation, 69, 100872.

43. Woyshner, C. (2016). Social Studies and Personalized Learning: Emerging Promising Practices From the Field. Handbook On, 273.

44. Yang, X., Wang, Y., Byrne, R., Schneider, G., & Yang, S. (2019). Concepts of artificial intelligence for computer-assisted drug discovery. Chemical Reviews, 119(18), 10520–10594.

45. Yesilyurt, Y. E. (2023). AI-Enabled Assessment and Feedback Mechanisms for Language Learning: Transforming Pedagogy and Learner Experience. In Transforming the Language Teaching Experience in the Age of AI (pp. 25–43). IGI Global.

46. Zhang, Z., Wen, F., Sun, Z., Guo, X., He, T., & Lee, C. (2022). Artificial intelligence-enabled sensing technologies in the 5G/internet of things era: from virtual reality/augmented reality to the digital twin. Advanced Intelligent Systems, 4(7), 2100228.