

Artificial intelligence in educational assessment: A bibliometric mapping of research trends (2020-2026)

Lisda Ramdhani¹, Sarwo Edy Wibowo²

Abstract

Background/purpose. Artificial intelligence (AI) has increasingly transformed educational assessment through automated grading systems, adaptive learning technologies, and personalized feedback mechanisms. The rapid development of generative AI and digital learning environments has significantly increased scholarly interest in AI-driven educational assessment. Therefore, this study aimed to examine the global research trends, thematic structures, and intellectual development of artificial intelligence in educational assessment research published between 2020 and 2026.

Materials/methods. This study employed a bibliometric research design using data obtained from Google Scholar through the Publish or Perish application. A total of 500 publications related to AI in educational assessment were collected and analysed. The data were exported in RIS and CSV formats and analysed using VOSviewer and Microsoft Excel to identify publication trends, keyword co-occurrence networks, thematic clusters, and emerging research patterns.

Results. The findings revealed a substantial increase in publications concerning AI-driven educational assessment, particularly after 2023. The bibliometric mapping identified five major thematic clusters dominated by terms such as artificial intelligence, adaptive learning, automated grading, personalized feedback, and machine learning. Overlay visualization further demonstrated that recent studies increasingly focused on generative AI, ChatGPT, adaptive learning technologies, and real-time feedback systems as emerging research trends.

Conclusion. Research on AI in educational assessment has developed into a rapidly growing and multidisciplinary field integrating technological, pedagogical, and data-driven educational perspectives. Although AI-driven assessment demonstrates considerable potential in improving efficiency and personalization, ethical concerns related to fairness, transparency, and human oversight remain important issues for future educational research and practice.

Research Article

Cite this article: Ramdhani, L., & Wibowo, S.E. (2026). Artificial intelligence in educational assessment: A bibliometric mapping of research trends (2020-2026). *EDURE: International Journal of Educational Research And Evaluation*, 1(1), 1–13. <https://doi.org/xx.xxxx/xxxxx>

Received: May 27, 2026

Accepted: May 29, 2026

Published: May 31, 2026

Keywords: artificial intelligence, educational assessment, bibliometric analysis, adaptive learning, personalized feedback

Author for correspondence:

Lisda Ramdhani

✉ lisda@student.undiksha.ac.id

Author(s) Affiliation:

¹Universitas Pendidikan Ganesha, Indonesia

²STKIP Harapan Bima, Indonesia



**OPEN
ACCESS**

© The Author(s), 2026. This is an Open Access article, distributed under the terms and conditions of the Creative Commons Attribution (CC BY 4.0) license.

1. Introduction

The rapid advancement of artificial intelligence (AI) has significantly transformed contemporary educational practices, particularly in teaching, learning, and assessment systems. The integration of AI technologies into education reflects the broader movement toward digital transformation and Education 5.0, where intelligent systems increasingly support efficiency, personalisation, and data-driven decision-making processes. Recent studies highlighted that machine learning (ML), natural language processing (NLP), computer vision, and large language models (LLMs) are progressively reshaping educational ecosystems through adaptive learning, automated evaluation, and personalised instructional support (Ouyang et al., 2023; Wang et al., 2024; Pang et al., 2024; Gnanaprakasam & Lourdasamy, 2024). The expansion of online and hybrid learning environments has further accelerated the adoption of AI-driven educational technologies that can support large-scale and diverse student populations efficiently (Huang et al., 2023; Nazari et al., 2021; Sutrisno, 2024).

Among various educational domains, assessment has become one of the most rapidly evolving areas influenced by AI integration. Traditional assessment practices that rely heavily on manual grading and subjective judgement are increasingly viewed as insufficient for addressing contemporary educational demands. Previous studies consistently reported that AI-driven assessment systems improve grading efficiency, consistency, scalability, and objectivity while reducing educator workload and minimising human bias in evaluation processes (González-Calatayud et al., 2021; Ouyang et al., 2023; Kooli & Yusuf, 2024; Messer et al., 2024). AI technologies are now widely implemented in automated essay grading, intelligent tutoring systems, adaptive learning platforms, and personalised feedback systems that facilitate more responsive and continuous assessment practices (Bulut et al., 2024; Lyanda et al., 2024; Hammad et al., 2024; Tahir et al., 2024).

The growing implementation of AI in educational assessment has generated substantial optimism regarding the future of more adaptive and learner-centred evaluation systems. Automated grading technologies enable institutions to process extensive volumes of student work more efficiently while maintaining relatively consistent grading standards (Mahamuni et al., 2024; Abuodha & Kipkebut, 2024; Lee, 2023). In addition, adaptive learning systems and AI-supported feedback mechanisms provide real-time and personalised feedback that may strengthen learner engagement, self-regulated learning, and academic achievement (Huang & te Winkel, 2022; Hooda et al., 2022; Saini et al., 2024). These developments indicate that AI-driven assessment is not merely a technological innovation but also a pedagogical transformation capable of reshaping how learning performance is evaluated and supported.

Despite its transformative potential, AI integration in educational assessment remains accompanied by critical challenges and ethical concerns. Several scholars argued that AI-based assessment systems continue to face limitations related to contextual understanding, interpretability, fairness, and adaptability, particularly in subjective and creative forms of assessment (Memarian & Doleck, 2024; Lin et al., 2022; Pang et al., 2024). Concerns regarding algorithmic bias, data privacy, security, and overreliance on automated systems have also become major issues within AI-driven educational environments (Gamage et al., 2023; Chaudhry & Kazim, 2021; Sghir et al., 2023). Consequently, many researchers emphasised that AI should complement rather than replace human educators, as pedagogical judgement, empathy, and contextual interpretation remain essential components of educational assessment (Kooli & Yusuf, 2024; Saini et al., 2024; Gnanaprakasam & Lourdasamy, 2024).

The increasing scholarly interest in AI-driven educational assessment has produced a rapidly expanding body of literature across diverse educational contexts. Existing studies primarily focused on systematic reviews, empirical investigations, and conceptual discussions concerning automated grading, personalised feedback, adaptive learning, and ethical implications of AI integration in education. For instance, Deepshikha (2026) highlighted both the opportunities and implementation challenges of AI-driven grading and personalised feedback systems in higher education. However, despite the growing number of publications, limited studies have systematically examined the intellectual structure and global development trends within this research field. Existing literature

largely overlooks publication growth, collaboration networks, influential authors, and emerging thematic patterns that shape the evolution of AI-driven educational assessment research.

Therefore, this study aims to conduct a bibliometric mapping of research trends on artificial intelligence in educational assessment published between 2020 and 2026. Through the analysis of publication trends, citation structures, and keyword co-occurrence networks, this study seeks to provide a comprehensive overview of the global research landscape concerning AI-driven educational assessment. The findings are expected to identify influential research themes, emerging trends, and potential future directions that may contribute to the advancement of more effective, equitable, and innovative assessment practices in education.

2. Literature Review

Artificial intelligence (AI) has increasingly transformed educational assessment through the integration of machine learning (ML), natural language processing (NLP), computer vision, and adaptive learning technologies. AI-driven assessment systems are widely utilised to automate grading processes, generate personalised feedback, and support adaptive learning environments that enhance efficiency, scalability, and consistency in educational evaluation (Ouyang et al., 2023; González-Calatayud et al., 2021; Kooli & Yusuf, 2024; Pang et al., 2024). In addition, AI-supported assessment technologies enable real-time feedback and personalised learning experiences that may strengthen learner engagement, self-regulated learning, and academic achievement (Huang & te Winkel, 2022; Hooda et al., 2022; Saini et al., 2024). These developments indicate that AI-driven educational assessment represents not only technological innovation but also a pedagogical transformation toward more learner-centred and data-driven assessment practices.

Despite its growing implementation, AI-driven educational assessment remains accompanied by several critical challenges and ethical concerns. Previous studies highlighted issues related to algorithmic bias, fairness, transparency, interpretability, and data privacy within AI-supported educational environments (Memarian & Doleck, 2024; Lin et al., 2022; Gamage et al., 2023). Scholars further argued that AI technologies should complement rather than replace human educators because pedagogical judgement, empathy, and contextual interpretation remain essential elements of assessment processes (Gnanaprakasam & Lourdasamy, 2024; Kooli & Yusuf, 2024; Saini et al., 2024). Consequently, research concerning AI-driven educational assessment continues to expand rapidly across various educational contexts and disciplinary perspectives.

Table 1 presents several previous studies related to artificial intelligence in educational assessment and educational technology research. The table indicates that most previous studies focused on systematic reviews, conceptual discussions, and implementation studies, while limited attention has been devoted to bibliometric mapping studies specifically examining AI-driven educational assessment research. Therefore, the present study seeks to fill this gap by providing a comprehensive bibliometric mapping of research trends on artificial intelligence in educational assessment from 2020 to 2026.

Table 1. Research on artificial intelligence in educational assessment.

No	Title	Reference
1	A Systematic Review on the Future of Educational Assessment: AI-Driven Grading and Personalised Feedback in Higher Education	Deepshikha (2026)
2	Artificial Intelligence in Education: A Bibliometric Analysis of Global Research Trends	Ouyang et al. (2023)
3	AI-Driven Educational Assessment Systems and Adaptive Learning Technologies	Gnanaprakasam & Lourdasamy (2024)
4	Bibliometric Mapping of Educational Technology Research: Trends and Future Directions	Wang et al. (2024)

No	Title	Reference
5	Evaluation of assessment projects in English language education: A bibliometric review	Oya et al. (2024)

3. Methodology

3.1 Research Design

This study employed a bibliometric research design to examine the development and research trends of artificial intelligence (AI) in educational assessment from 2020 to 2026. Bibliometric analysis is widely used to identify publication trends, influential authors, collaboration networks, citation patterns, and thematic structures within a particular research field. The method enables researchers to systematically map the intellectual landscape and emerging themes of scientific publications through quantitative and visual analysis. In this study, bibliometric mapping was conducted to explore the evolution and conceptual structure of AI-driven educational assessment research.

3.2 Data Source

The data used in this study were obtained from Google Scholar through the Publish or Perish (PoP) application. Google Scholar was selected because it provides broad coverage of scholarly publications across journals, conference proceedings, books, and other academic sources. The data collection focused on publications related to artificial intelligence in educational assessment published between 2020 and 2026. The search process used several keywords and phrases, including “artificial intelligence”, “AI”, “educational assessment”, “automated grading”, “adaptive learning”, and “personalized feedback”. A total of 500 publications were retrieved and exported in RIS and CSV formats for further analysis.

3.3 Data Collection Procedure

The data collection process began by identifying relevant keywords associated with AI-driven educational assessment research. Searches were conducted through Publish or Perish using Google Scholar as the primary database source. The retrieved publications were then screened based on relevance to the research topic, publication period, and document completeness. Duplicate and irrelevant records were excluded to ensure data consistency and relevance. Subsequently, the selected dataset was exported in RIS format for bibliometric mapping and CSV format for descriptive analysis.

3.4 Data Analysis

The collected data were analysed using VOSviewer and Microsoft Excel. VOSviewer was utilised to visualise co-occurrence networks, keyword relationships, thematic clusters, and research trends within AI-driven educational assessment studies. Meanwhile, Microsoft Excel was used to organise publication data and analyse publication trends descriptively. The bibliometric analysis focused on publication growth, keyword co-occurrence, thematic mapping, and emerging research trends to provide a comprehensive overview of the development of artificial intelligence research in educational assessment.

4. Results

4.1. AI in Educational Assessment 2020-2026

Figure 1 presents the publication trend of research on artificial intelligence in educational assessment from 2020 to 2026. The findings indicate a substantial increase in scholarly publications over the observed period. Research publications remained relatively limited between 2020 and 2022, with only gradual growth recorded during the early years. However, a significant increase began to emerge in 2023, followed by a sharp rise in 2024, which reached the highest number of publications with 200 documents.

Although the number of publications slightly decreased in 2025, the research output remained considerably high compared to previous years, indicating sustained scholarly interest in AI-driven educational assessment. Meanwhile, publications in 2026 showed a lower frequency because the data

collection process was conducted before the completion of the publication year. Overall, the trend demonstrates that research concerning artificial intelligence in educational assessment has experienced rapid growth, particularly following the expansion of digital learning environments and AI-based educational technologies in recent years

Table 1. Annual report research on “AI in educational assessment”.

No	Years	Documents	Percentages
1	2020	4	0,80%
2	2021	7	1,40%
3	2022	15	3,00%
4	2023	69	13,80%
5	2024	200	40,00%
6	2025	188	37,60%
7	2026	17	3,40%
Total		500	100%

Source: Research Data (2026)

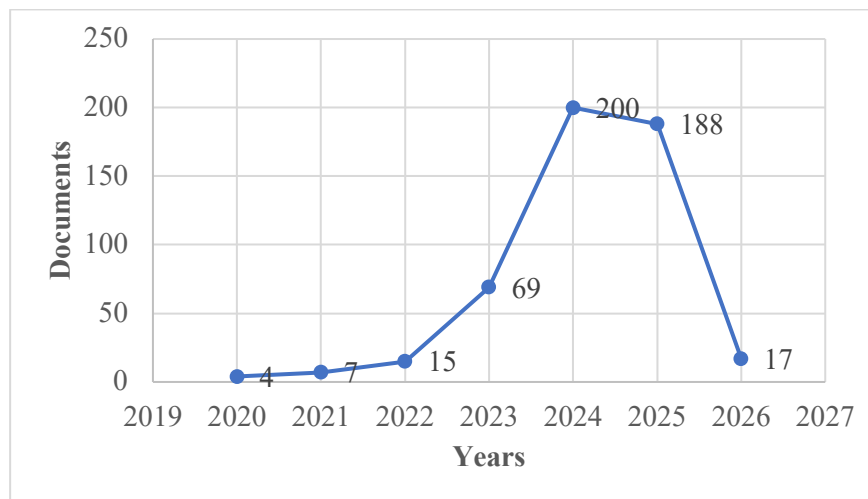


Figure 1. Annual report of publications

4.2. Most Influential and Highly Cited Publications

Table 2 presents the most influential and highly cited publications related to artificial intelligence in educational assessment. The findings indicate that studies discussing AI-driven grading systems, personalised feedback mechanisms, adaptive learning platforms, and intelligent tutoring systems received substantial scholarly attention. Highly cited publications generally focused on the transformative potential of AI technologies in improving assessment efficiency, scalability, consistency, and learner engagement within digital learning environments.

Among the dominant themes identified in the highly cited publications were automated essay grading, adaptive feedback systems, machine learning integration, and ethical concerns related to AI implementation in education. Several influential studies also highlighted the growing role of AI technologies in supporting personalised learning experiences and data-driven educational decision-making processes. Overall, the citation patterns demonstrate that AI-driven educational assessment has emerged as an increasingly significant and rapidly developing research area within contemporary educational technology studies.

Table 3. Most cited articles on AI in educational assessment.

No	Cites	Title	Year	Cites Per Year	Reference
1	5000	Education in the era of generative artificial intelligence (AI): Understanding the potential benefits of ChatGPT in promoting teaching and learning	2023	1666.67	Baidoo-Anu & Ansah (2023)
2	3368	ChatGPT: Bullshit spewer or the end of traditional assessments in higher education?	2023	1122.67	Rudolph et al. (2023)
3	2970	Artificial intelligence in higher education: the state of the field	2023	990.00.00	Crompton & Burke (2023)
4	1354	The impact of artificial intelligence on learner–instructor interaction in online learning	2021	270.80	Seo et al. (2021)
5	1136	A meta systematic review of artificial intelligence in higher education: A call for increased ethics, collaboration, and rigour	2024	568.00.00	Bond et al. (2024)
6	1032	The role of ChatGPT in higher education: Benefits, challenges, and future research directions	2023	344.00.00	Rasul et al. (2023)
7	978	Artificial intelligence innovation in education: A twenty-year data-driven historical analysis	2020	163.00.00	Guan et al. (2020)
8	813	A review on artificial intelligence in education	2021	162.60	Huang et al. (2021)
9	801	Exploring the potential of artificial intelligence tools in educational measurement and assessment	2023	267.00.00	Owan et al. (2023)
10	765	The application of AI technologies in STEM education: a systematic review from 2011 to 2021	2022	191.25.00	Xu & Ouyang (2022)
11	735	Exploring artificial intelligence in academic essay: higher education student's perspective	2023	245.00.00	Malik et al. (2023)
12	719	Role of AI in Education	2023	239.67	Harry & Sayudin (2023)
13	555	Integration of artificial intelligence performance prediction and learning analytics to improve student learning in online engineering course	2023	185.00.00	Ouyang et al. (2023)
14	541	Artificial intelligence applications in Latin American higher education: a systematic review	2022	135.25.00	Salas-Pilco & Yang (2022)
15	528	A scoping review on how generative artificial intelligence transforms assessment in higher education	2024	264.00.00	Xia et al. (2024)

The first cluster (red), consisting of 11 items, includes adaptive learning experience, artificial intelligence, automated grading system, benefit, challenge, ChatGPT, comprehensive review, instant feedback, literature opportunity, and review. This cluster primarily reflects discussions concerning the opportunities, challenges, and emerging applications of AI technologies within educational assessment contexts.

The second cluster (green), comprising 11 items, includes adaptive learning technology, automated grading, effectiveness, era, generative AI, generative artificial intelligence, literature review, paper, personalized feedback, potential, and strategic. This cluster indicates the growing scholarly interest in generative AI technologies and their strategic implementation in educational assessment and feedback systems.

The third cluster (blue), consisting of 9 items, includes adaptive learning environment, adaptive learning platform, AI tool, data, grade, immediate feedback, implication, outcome, and teacher. This cluster highlights the integration of AI-supported tools and adaptive learning environments in facilitating assessment processes and improving learning outcomes.

The fourth cluster (yellow), consisting of 7 items, includes AI technology, example, learner, machine learning, research, support, and systematic literature review. This cluster mainly represents studies focusing on AI technologies, machine learning applications, and research developments within educational contexts.

The fifth cluster (purple), consisting of 3 items, includes adaptive learning system, intelligence tutoring system, and real-time feedback. This cluster reflects research concerning intelligent tutoring systems and adaptive feedback mechanisms designed to support responsive and personalised educational assessment practices.

The overlay visualization presented in Figure 3 demonstrates the temporal development of research themes in AI-driven educational assessment. The visualization indicates that recent studies increasingly focused on topics related to generative AI, ChatGPT, personalized feedback, and adaptive learning technologies. These findings suggest that the integration of emerging AI technologies into educational assessment has become a growing research trend in recent years.

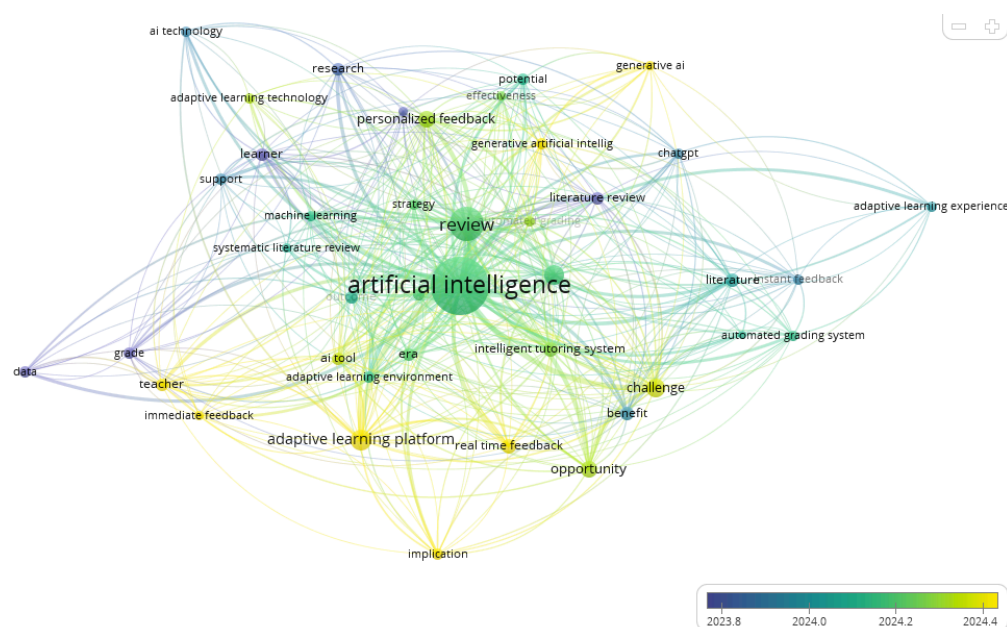


Figure 3. Overlay visualization based on co-occurrence of terms.

Furthermore, the density visualization shown in Figure 4 illustrates the concentration and frequency of term occurrences within the research network. Terms displayed in brighter colours represent topics with higher occurrence frequencies and stronger relationships within the dataset. The density map indicates that artificial intelligence, adaptive learning, automated grading, and personalized feedback emerged as the most dominant and intensively studied themes in AI-driven educational assessment research.

improve efficiency and scalability, human oversight remains essential to ensure contextual interpretation, empathy, and pedagogical appropriateness within assessment processes (Lin et al., 2022; Gamage et al., 2023; Kooli & Yusuf, 2024). Therefore, the future development of AI-driven educational assessment should balance technological innovation with ethical responsibility and human-centred educational values.

Overall, the findings of this study demonstrate that AI-driven educational assessment research has developed into a multidisciplinary and rapidly evolving field integrating technological, pedagogical, and data-driven educational perspectives. The bibliometric patterns identified in this study provide important insights regarding dominant research themes, emerging trends, and future research directions within AI-supported educational assessment. Furthermore, the findings contribute to the growing literature by providing a comprehensive overview of the intellectual structure and global development trends of AI in educational assessment research during the 2020–2026 period.

6. Conclusion

This study revealed that research on artificial intelligence (AI) in educational assessment experienced significant growth during the 2020–2026 period, particularly following the expansion of digital learning environments and generative AI technologies. The bibliometric mapping identified several dominant themes, including artificial intelligence, adaptive learning, automated grading, personalized feedback, and machine learning, indicating the increasing integration of intelligent technologies within contemporary educational assessment practices. The findings also demonstrated that recent studies increasingly focus on generative AI, ChatGPT, adaptive learning systems, and real-time feedback mechanisms as emerging research trends. Despite the growing potential of AI-driven assessment systems, ethical concerns related to fairness, transparency, and human oversight remain important challenges requiring further scholarly attention. Overall, this study provides a comprehensive overview of the intellectual structure and research development trends of AI in educational assessment and offers valuable insights for future research and educational practice.

7. Suggestion

Based on the findings of this study, future researchers are encouraged to conduct more comprehensive investigations concerning the implementation and effectiveness of artificial intelligence (AI) in various educational assessment contexts, particularly related to generative AI, adaptive learning systems, and real-time feedback technologies. Further studies may also explore ethical issues such as algorithmic bias, transparency, fairness, and data privacy to support the responsible integration of AI in education. In addition, educational institutions and policymakers are recommended to develop balanced AI-based assessment frameworks that combine technological innovation with human pedagogical judgement to ensure more effective, equitable, and learner-centred assessment practices.

Declarations

Author Contributions. L.R: Literature review, conceptualization, methodology, data analysis. S.E.W.: review-editing, original manuscript preparation. All authors have read and approved the published on the final version of the article.

Conflicts of Interest. The authors declare no conflict of interest.

Funding. This research received no external funding.

Ethical Approval. Ethical approval was not required for this study because the research utilised publicly accessible bibliographic data obtained from Google Scholar through the Publish or Perish application and did not involve human participants.

Data Availability Statement. The data supporting the findings of this study are available from the corresponding author upon reasonable request.

Acknowledgments. The author would like to express gratitude to all researchers and scholars whose publications contributed to the bibliometric dataset analysed in this study.

References

- Abuodha, L., & Kipkebut, A. (2024). Disruptive AI in education: Transforming learning in the digital age. *International Journal for Research in Applied Science and Engineering Technology (IJRASET)*, 12(2), 195–199. <https://doi.org/10.22214/ijraset.2024.58283>
- Baidoo-Anu, D., & Ansah, L. O. (2023). Education in the era of generative artificial intelligence (AI): Understanding the potential benefits of ChatGPT in promoting teaching and learning. *Journal of AI*, 7(1), 52-62.
- Bond, M., Khosravi, H., De Laat, M., Bergdahl, N., Negrea, V., Oxley, E., ... & Siemens, G. (2024). A meta systematic review of artificial intelligence in higher education: A call for increased ethics, collaboration, and rigour. *International journal of educational technology in higher education*, 21(1), 4. <https://doi.org/10.1186/s41239-023-00436-z>
- Bulut, O., Beiting-Parrish, M., Casabianca, J. M., Slater, S. C., Jiao, H., Song, D., Ormerod, C., Fabiyi, D. G., Ivan, R., Walsh, C., Rios, O., Wilson, J., Yildirim-Erbasli, S. N., Wongvorachan, T., Liu, J. X., Tan, B., & Morilova, P. (2024). The rise of artificial intelligence in educational measurement: Opportunities and ethical challenges. *Chinese/English Journal of Educational Measurement and Evaluation*, 5(3). <https://doi.org/10.59863/MIQL7785>
- Chaudhry, M. A., & Kazim, E. (2021). Artificial intelligence in education (AIEd): A high-level academic and industry note 2021. *AI and Ethics*, 2(2), 157–165. <https://doi.org/10.1007/s43681-021-00074-z>
- Chu, H. C., Hwang, G. H., Tu, Y. F., & Yang, K. H. (2022). Roles and research trends of artificial intelligence in higher education: A systematic review of the top 50 most-cited articles. *Australasian Journal of Educational Technology*, 38(3), 22-42. <https://doi.org/10.14742/ajet.7526>
- Crompton, H., Burke, D. Artificial intelligence in higher education: the state of the field. *Int J Educ Technol High Educ* 20, 22 (2023). <https://doi.org/10.1186/s41239-023-00392-8>
- Crompton, H., Jones, M. V., & Burke, D. (2024). Affordances and challenges of artificial intelligence in K-12 education: A systematic review. *Journal of research on technology in education*, 56(3), 248-268. <https://doi.org/10.1080/15391523.2022.2121344>
- Dave, M., & Patel, N. (2023). Artificial intelligence in healthcare and education. *British dental journal*, 234(10), 761-764. <https://doi.org/10.1038/s41415-023-5845-2>
- Deepshikha, D. (2026). A systematic review on the future of educational assessment: AI-driven grading and personalised feedback in higher education. In *Artificial intelligence in education* (Vol. 2, No. 2, pp. 75–115). Emerald Publishing Limited.
- Gamage, K. A. A., Dehideniya, S. C. P., Xu, Z., & Tang, X. (2023). ChatGPT and higher education assessments: More opportunities than concerns? *Journal of Applied Learning and Teaching*, 6(2), 358–373. <https://doi.org/10.37074/jalt.2023.6.2.32>
- Gnanaprakasam, J., & Lourdusamy, R. (2024). The role of AI in automating grading: Enhancing feedback and efficiency. In *Artificial intelligence and education: Shaping the future of learning*. IntechOpen. <https://doi.org/10.5772/intechopen.1005025>
- Gonzalez-Calatayud, V., Prendes-Espinosa, P., & Roig-Vila, R. (2021). Artificial intelligence for student assessment: A systematic review. *Applied Sciences*, 11(12), 5467. <https://doi.org/10.3390/app11125467>
- Guan, C., Mou, J., & Jiang, Z. (2020). Artificial intelligence innovation in education: A twenty-year data-driven historical analysis. *International journal of innovation studies*, 4(4), 134-147. <https://doi.org/10.1016/j.ijis.2020.09.001>
- Hammad, M. M., Al-Refai, M., Musallam, W., Musleh, S., & Faouri, E. (2024). A taxonomy of AI-based assessment educational technologies. In *15th International Conference on Information and Communication Systems (ICICS)* (pp. 1–6). <https://doi.org/10.1109/ICICS63486.2024.10638295>
- Harry, A., & Sayudin, S. (2023). Role of AI in Education. *Interdisciplinary Journal and Humanity (INJURITY)*, 2(3), 260-268. <https://doi.org/10.58631/injury.v2i3.52>

- Hooda, M., Rana, C., Dahiya, O., Rizwan, A., & Hossain, M. S. (2022). Artificial intelligence for assessment and feedback to enhance student success in higher education. *Mathematical Problems in Engineering*, 2022, 1–19. <https://doi.org/10.1155/2022/5215722>
- Huang, J., Saleh, S., & Liu, Y. (2021). A review on artificial intelligence in education. *Academic Journal of Interdisciplinary Studies*, 10(3). <https://doi.org/10.36941/ajis-2021-0077>
- Huang, L., Zhang, Q., & Li, Y. (2023). Leveraging AI tools to raise student engagement in hybrid learning environments. *Journal of Educational Innovation*, 12(1), 23–41.
- Huang, Z., & te Winkel, W. (2022). Automated feedback: An AI-powered tool to scale micro-level feedback for better academic writing. In *Proceedings of EUNIS* (Vol. 1, pp. 1–10).
- Kooli, C., & Yusuf, N. (2024). Transforming educational assessment: Insights into the use of ChatGPT and large language models in grading. *International Journal of Human-Computer Interaction*, 41, 1–12. <https://doi.org/10.1080/10447318.2024.2338330>
- Lee, A. V. Y. (2023). Supporting students' generation of feedback in large-scale online courses with artificial intelligence-enabled evaluation. *Studies in Educational Evaluation*, 77, 101250. <https://doi.org/10.1016/j.stueduc.2023.101250>
- Lin, J., Sha, L., Li, Y., Gašević, D., & Chen, G. (2022). Establishing trustworthy artificial intelligence in automated feedback. *Open Science Framework*, 1–7. <https://doi.org/10.35542/osf.io/5efxn>
- Lyanda, J. N., Owidi, S. O., & Simiyu, A. M. (2024). Rethinking higher education teaching and assessment in line with AI innovations: A systematic review and meta-analysis. *African Journal of Empirical Research*, 5(3), 325–335. <https://doi.org/10.51867/ajernet.5.3.30>
- Mahamuni, A. J., Parminder, Tonpe, S. S., & Vishwanath. (2024). Enhancing educational assessment with artificial intelligence: Challenges and opportunities. In *IEEE Xplore* (pp. 1–5). <https://doi.org/10.1109/ICKECS61492.2024.10616620>
- Malik, A. R., Pratiwi, Y., Andajani, K., Numertayasa, I. W., Suharti, S., & Darwis, A. (2023). Exploring artificial intelligence in academic essay: higher education student's perspective. *International Journal of Educational Research Open*, 5, 100296. <https://doi.org/10.1016/j.ijedro.2023.100296>
- Memarian, B., & Doleck, T. (2024). A review of assessment for learning with artificial intelligence. *Computers in Human Behavior: Artificial Humans*, 2(1), 100040. <https://doi.org/10.1016/j.chbah.2023.100040>
- Messer, M., Brown, N. C. C., Kölling, M., & Shi, M. (2024). Automated grading and feedback tools for programming education: A systematic review. *ACM Transactions on Computing Education*, 24(1), 1–43. <https://doi.org/10.1145/3636515>
- Nazari, M., Rezaei, S., & Ahmadi, F. (2021). Strategies to enhance student engagement through technology integration. *Technology in Education Journal*, 15(4), 56–72.
- Onesi-Ozigagun, O., Ololade, Y. J., Eyo-Udo, N. L., & Ogundipe, D. O. (2024). Revolutionizing education through AI: a comprehensive review of enhancing learning experiences. *International Journal of Applied Research in Social Sciences*, 6(4), 589-607. <https://doi.org/10.51594/ijarss.v6i4.1011>
- Ouyang, F., Dinh, T. A., & Xu, W. (2023). A systematic review of AI-driven educational assessment in STEM education. *Journal for STEM Education Research*, 6(3), 1234567890–426. <https://doi.org/10.1007/s41979-023-00112-x>
- Ouyang, F., Wu, M., Zheng, L., Zhang, L., & Jiao, P. (2023). Integration of artificial intelligence performance prediction and learning analytics to improve student learning in online engineering course. *International Journal of Educational Technology in Higher Education*, 20(1), 4. <https://doi.org/10.1186/s41239-022-00372-4>
- Owan, V. J., Abang, K. B., Idika, D. O., Etta, E. O., & Bassey, B. A. (2023). Exploring the potential of artificial intelligence tools in educational measurement and assessment. *Eurasia journal of mathematics, science and technology education*, 19(8), em2307. <https://doi.org/10.29333/ejmste/13428>
- Oya, A. (2024). Evaluation of assessment projects in English language education: A bibliometric review. *ASEAN Journal of Educational Research and Technology*, 3(3), 255–266.

- Pang, T. Y., Kootsookos, A., & Cheng, C.-T. (2024). Artificial intelligence use in feedback: A qualitative analysis. *Journal of University Teaching and Learning Practice*, 21(6). <https://doi.org/10.53761/40wmcj98>
- Rasul, T., Nair, S., Kalendra, D., Robin, M., de Oliveira Santini, F., Ladeira, W., ... & Heathcote, L. (2023). The role of ChatGPT in higher education: Benefits, challenges, and future research directions. *Journal of Applied Learning & Teaching*, 6(1), 41-56. <https://search.informit.org/doi/10.3316/informit>
- Rudolph, J., Tan, S., & Tan, S. (2023). ChatGPT: Bullshit spewer or the end of traditional assessments in higher education?. *Journal of applied learning & teaching*, 6(1), 342-363. <https://search.informit.org/doi/10.3316/informit>
- Saini, A., Hassan, A. M., Awasthi, A., & Baiswar, A. (2024). Enhancing self-assessment through AI-driven questioner: A study on efficacy and user experience. *International Research Journal of Modernization in Engineering Technology and Science*, 6(3). <https://doi.org/10.56726/IRJMETS51436>
- Salas-Pilco, S. Z., & Yang, Y. (2022). Artificial intelligence applications in Latin American higher education: a systematic review. *International Journal of Educational Technology in Higher Education*, 19(1), 21. <https://doi.org/10.1186/s41239-022-00326-w>
- Schmidt, T., & Strasser, T. (2022). Artificial intelligence in foreign language learning and teaching: a CALL for intelligent practice. *Anglistik: International Journal of English Studies*, 33(1), 165-184.
- Seo, K., Tang, J., Roll, I., Fels, S., & Yoon, D. (2021). The impact of artificial intelligence on learner–instructor interaction in online learning. *International journal of educational technology in higher education*, 18(1), 54. <https://doi.org/10.1186/s41239-021-00292-9>
- Sghir, N., Adadi, A., & Lahmer, M. (2023). Recent advances in predictive learning analytics: A decade systematic review (2012–2022). *Education and Information Technologies*, 28(7), 8299–8333. <https://doi.org/10.1007/s10639-022-11536-0>
- Sutrisno, S. E. (2024). Investigating AI's automated feedback in English language learning. *FLIP: Foreign Language Instruction Probe*, 3(1), 76–87. <https://doi.org/10.54213/flip.v3i1.401>
- Tahir, M., Hassan, F. D., & Shagoo, M. R. (2024). Role of artificial intelligence in education: A conceptual review. *World Journal of Advanced Research and Reviews*, 22(1), 1469–1475. <https://doi.org/10.30574/wjarr.2024.22.1.1217>
- Wang, S., Wang, F., Zhu, Z., Wang, J., Tran, T., & Du, Z. (2024). Artificial intelligence in education: A systematic literature review. *Expert Systems with Applications*, 252, 124167. <https://doi.org/10.1016/j.eswa.2024.124167>
- Xia, Q., Weng, X., Ouyang, F., Lin, T. J., & Chiu, T. K. (2024). A scoping review on how generative artificial intelligence transforms assessment in higher education. *International Journal of Educational Technology in Higher Education*, 21(1), 40. <https://doi.org/10.1186/s41239-024-00468-z>
- Xu, W., & Ouyang, F. (2022). The application of AI technologies in STEM education: a systematic review from 2011 to 2021. *International Journal of STEM Education*, 9(1), 59. <https://doi.org/10.1186/s40594-022-00377-5>