

Train the Trainer: Using an AI Teacher to Upskill Teachers in India

Formar a los Formadores: Uso de un Profesor de IA para Capacitar a Docentes en la India

PAULDY CJ OTERMANS 

OIAI by Otermans Institute, London, United Kingdom

DEV ADITYA 

OIAI by Otermans Institute, London, United Kingdom

ABSTRACT

This study explores the effectiveness of utilising an autonomous AI teacher, represented through an avatar, in enhancing the skills and upskilling existing teachers in India. Focused on nursery-level teaching methods and curriculum development, the research employed a specialised generative AI language model, OIMISA7B, with a 7-billion parameter setup designed specifically for educational delivery. The AI avatar, designed to resemble a female trainer, delivered a series of four lessons, each approximately one hour in length. The study assessed the efficacy of this innovative teaching approach through monitoring programme completion rates, and tracking inquiries made to the AI for further clarifications and doubts. The core focus of the paper is to go beyond directly AI-enabled teaching for students which the researchers have conducted several times before, and instead look at empowering the ecosystem, in this case training the teachers.

Keywords: AI in Education, AI, Generative AI, Machine Learning, Teacher Training, Education, Artificial Intelligence

RESUMEN

Este estudio explora la eficacia de utilizar un profesor autónomo basado en inteligencia artificial (IA), representado a través de un avatar, para mejorar las habilidades y capacitar a docentes en la India. Centrado en métodos de enseñanza para nivel preescolar y desarrollo curricular, la investigación empleó un modelo de lenguaje generativo de IA especializado, OIMISA7B, con una configuración de 7 mil millones de parámetros diseñada específicamente para la enseñanza. El avatar de IA, diseñado para parecerse a una instructora femenina, impartió una serie de cuatro lecciones, cada una de aproximadamente una hora de duración. El estudio evaluó la eficacia de este enfoque innovador de enseñanza al monitorear las tasas de finalización del programa y rastrear las consultas realizadas a la IA para aclaraciones y dudas adicionales. El enfoque principal del artículo es ir más allá de la enseñanza habilitada directamente por IA para los estudiantes, la cual los investigadores han llevado a cabo en varias ocasiones anteriormente, y centrarse en fortalecer el ecosistema, en este caso, capacitando a los docentes.

Palabras clave: IA en Educación, IA, IA Generativa, Aprendizaje Automático, Capacitación Docente, Educación, Inteligencia Artificial



Introduction

The integration of Artificial Intelligence (AI) into education presents a revolutionary opportunity to enhance teaching methodologies and curriculum development. Recent studies indicate that students generally have positive perceptions of AI in education, recognising its potential benefits for learning (Idroes et al., 2023; Holmes & Anastopoulou, 2019). However, concerns persist regarding data privacy, ethical use, and potential drawbacks of AI implementation (Idroes et al., 2023; Vavekanand, 2024). The integration of AI in education raises questions about student autonomy, transparency, and accountability (Gluoksnyte, White, & Zitkus, 2024). While AI is seen as transformative for education provision, there is a need for ongoing research and development to address ethical considerations and ensure responsible adoption (Gluoksnyte, White, & Zitkus, 2024; Vavekanand, 2024). Both students and academic/teaching staff recognise the importance of balancing AI's potential benefits with careful consideration of its implications for educational structures, qualifications, and assessment processes (Gluoksnyte et al., 2024). Other research highlights students' have a significant interest in receiving dedicated support for integrating these AI tools into their learning, driven by the belief that such skills will be sought after by future employers (Thomson, Pickard-Jones, Baines, & Otermans, 2024). After all, the workforce and the graduate world beyond universities is increasingly adopting AI in their everyday life and various tasks, from personal devices to critical sectors like law, finance, and policing (Campolo, Sanfilippo, Whittaker, & Crawford, 2017). This transformation presents both challenges and opportunities for higher education institutions to prepare students for an AI-enabled future (Lau, Bonilla, &

Gárate, 2018). Universities need to focus on developing cognitive skills and AI competencies that will enable graduates to compete in the evolving job market (Lau et al., 2018; Thomson et al., 2024). Assessment methods in higher education should shift towards evaluating uniquely human capabilities, such as critical thinking, evaluative judgment, and creativity rather than pattern recognition and recall (Bearman & Luckin, 2020). These studies so far have focused on university students and implications of university policies for students' learning and not on the educators' use of AI or the professional development of educators through the use of AI. As AI continues to expand its influence, it is crucial to consider not only its technical capabilities but also its broader societal implications and ethical challenges (Harayama et al., 2021; Campolo et al., 2017).

Recently, students have been taught by an AI avatar who was trained solely for teaching and learning applications. This AI teacher provided a 9-lesson course on employability and transferable skills. In total 207 students across the three institutions enrolled in the programme. The results showed a noteworthy completion rate of over 47%, along with high levels of engagement across all student cohorts and high satisfaction rates from the students (Aditya, Silvestri, & Otermans, 2024). These show the potential for AI-based virtual teachers across countries for students of HE compared to the use of Massive Open Online Courses (MOOCs) platforms. These MOOCs have gained popularity in higher education but low completion rates remain a significant challenge. Studies indicate that MOOC completion rates usually range from 7-14% (Jordan, 2015). Gamification can increase the completion rate slightly (Nesterowicz et al., 2022). This is an area where AI teachers and other AI system are also providing an advantage through the use of two-

way conversational interactions compared to one-directional learning on MOOCs. However, this research focuses on university students and not on other learners.

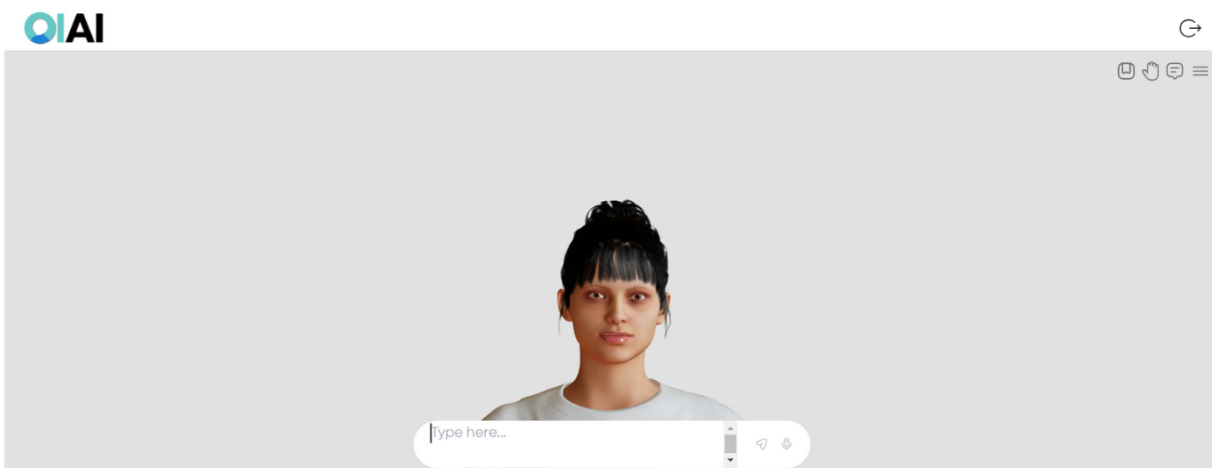
So far, research has focused a lot on the use of AI for student learning and development. Could AI be used even to upskill existing experts in the field; teachers? There is a clear gap in the literature on how AI can be used to enhance development of educators. This study aims to evaluate the effectiveness of an AI teacher, using a specialised language model for education; OIMISA7B, in upskilling existing teachers in India. The programme focused on a new curriculum covering teaching systems and curriculum development for nursery levels made by a company in India that is at the forefront of nursery learning in line with the National Education Policy in India 2020 guidelines. This Education policy focuses on transforming the education system to promote holistic, multidisciplinary, and skill-based learning. In addition, it provides a greater emphasis

on digital education and research. It is this skills-based learning and emphasis on digital education where AI can come in which is the focus of this study. By leveraging a sophisticated AI language model embodied in an avatar, the research investigates the potential of AI to provide a scalable and impactful approach to teacher training, addressing the critical need for quality education and efficient teacher development strategies; thereby becoming a stepping stone to democratising learning.

Methodology

The study utilised the OIMISA7B AI language model, a 7 billion parameter AI specifically designed for educational teaching purposes. The AI was embodied in an avatar representing a female trainer (Paleczna & Szmigielska-Siuta, 2020), aiming to provide a more relatable and engaging learning experience for the participants (Figure 1).

Figure 1:
Interface learners used to communicate with the AI teacher.



Parent-Teacher Communication

[About](#) [Resources](#) [Reviews](#) [Related Lessons](#) [Guided Tour](#)

Participants were 24 teachers who participated from the state of West Bengal, India. All teachers were proficient in English which was the language of delivery of the programme. These teachers were identified as being in need of this new training at nursery levels by the company employing them in India. No external variables of the participants were collected. The training programme comprised of four lessons, each lasting approximately one hour, covering various aspects of teaching methods and curriculum development at nursery level. The content was provided by the company in India and was in line with the national curriculum. Topics included understanding how to nurture emotional wellness in pre-schoolers, practical applications on how to support emotional wellness in pre-schoolers, professional development, and parent-teacher communication.

The methodology adopted for this study involved the following:

- **Monitoring completion rates:** Tracking the percentage of participants who completed the programme, providing insights into the engagement and effectiveness of the AI teaching model.
- **Monitoring questions asked:** Analysing the queries directed to the AI teacher, offering valuable feedback on areas of confusion or interest, and assessing the AI's capability to address and clarify doubts.
- **Post-programme survey:** After completion of the programme, participants were asked to complete a short survey about their experience.

The content was uploaded to the AI system and the AI extracted the relevant information to create the lessons and activities using Retrieval

Augmented Generation (RAG). The lessons were designed to be informative and engaging, and they included a variety of activities, such as open questions and multiple choice questions to test learners' knowledge on the content that they AI teacher provided. The teachers were given access to the AI teacher for a period of 2 weeks to go through the 4 lessons in their own time and at their own learning pace without disrupting their working schedule. This AI teacher provided participants with a safe and supportive environment powered by AI, where the learners can access 24-hours support and guidance at their convenience, asking questions to the AI teacher in cases of doubt, clarification or further deep dive. This includes questions they may not ask when taught in a workshop setting. Through the lessons, participants of this specific group enhanced their communication and critical thinking skills through interactive exercises, real-world scenarios, and personalised feedback.

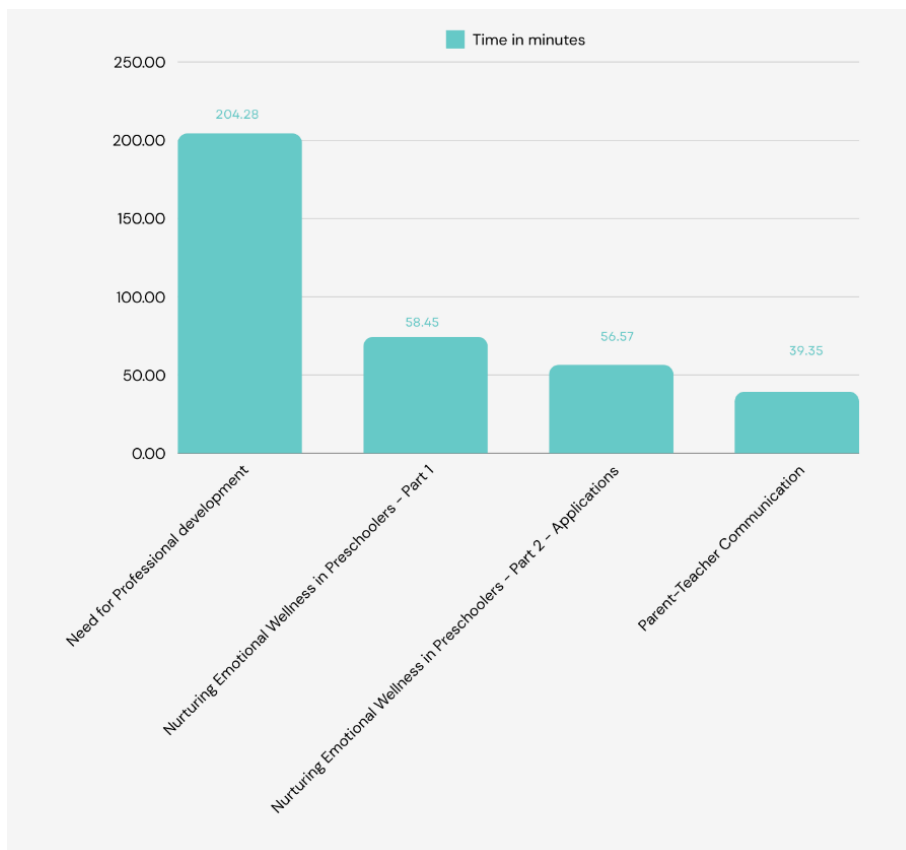
Findings

The study revealed high engagements with the AI teacher and great understanding of the content by the nursery teachers as indicated by completion rates and questions asked. The AI teacher, with its specialised knowledge base and interactive capabilities, facilitated a personalised learning experience, leading to enhanced engagement and retention of teaching concepts. The completion rates and the nature of the questions asked indicated a high level of interaction with the AI, suggesting its effectiveness as a teaching tool. Results showed that 45.8% of participants completed the entire programme (e.g., completed all four lessons with 100% completion rate for each). Compared to a global average of 7-14% for online learning (Jor-

dan, 2015). This highlights the potential of AI in upskilling teachers, with substantial improvements in knowledge and application of knowledge. Recorded interactions between the teachers and the AI teacher further highlighted this and presented additional data for the organisation. These indicated that 67 questions were asked on average per lesson. The learners asked questions to the AI teacher which projected they felt comfortable asking questions without fear of judgment, enabling them to seek clarification and explore concepts in greater depth.

In addition, figure 2 shows where the learners spent most of their time across the four lessons. As is shown, learners spent 3.5 hours on the first topic. When inquiring why this was so high, mainly two answers were given: 1) getting used to the platform and 2) more time was needed as this was an entirely new topic for the learners. For topics 2 and 3, learners spent approximately 1 hour on the lesson. For the final topic, around 40 minutes was spent as this was a slightly shorter lesson and many had to finish the lesson before the deadline.

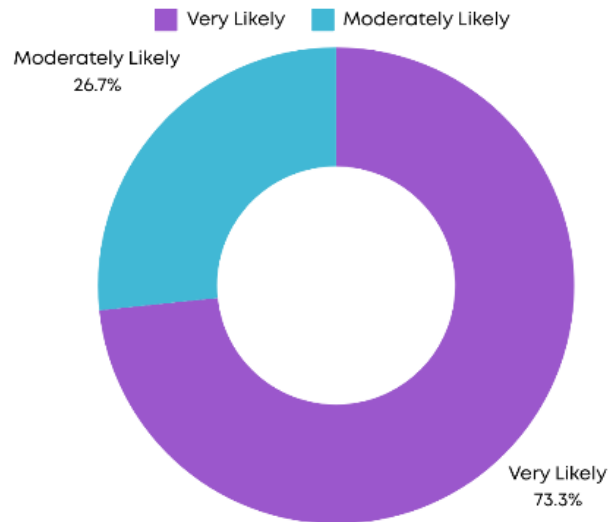
Figure 2:
Time spent across the four lessons.



Moreover, 15 of the 24 teachers said they would refer the programme to other teachers as it benefitted them in their learning journey and understanding of the topics. Furthermore, Figure 3 shows how likely it is that learners, after comple-

tion of the programme, would continue learning with the OI AI teachers. This was measured on a 5-point Likert-type scale and results showed that the majority of learners (73.3%) were very likely to continue learning with the AI teachers.

Figure 3:
Likelihood of continuing to learn with the AI teachers after the programme.



Learners were asked what they liked about learning with the AI teachers. Results showed that they liked the teacher, the clear explanations, and appreciated they can do a self-paced course which has the same quality as traditional ones. This is evidenced by the quote below from one of the learners:

“The digital teacher has a human-like appearance and voice and can interact with students using voice and text chats....so I understood all things easily.”

When asked what topics they would like to learn next, a variety of topics were indicated by the learners. These included: Emotional development, applied behaviour analytics, how to use AI, history, rhymes and social activities, com-

munication skills, how to teach special education needs students. Participants were asked to rate their overall satisfaction with the AI teacher using a 7-point Likert-type scale ranging from (1) Extremely unsatisfied to (7) Extremely satisfied. Similarly, they were asked to rate the usefulness of the lesson with the AI teacher using a 5-point Likert-type scale ranging from (1) Not useful to (5) Extremely useful. Figures 4 and 5 show that participants were very satisfied with the AI teacher (66.7% combined very and extremely satisfied) and the programme, and found the AI very useful (85.8% combined very and extremely useful).

Figure 4:
Overall satisfaction rates.

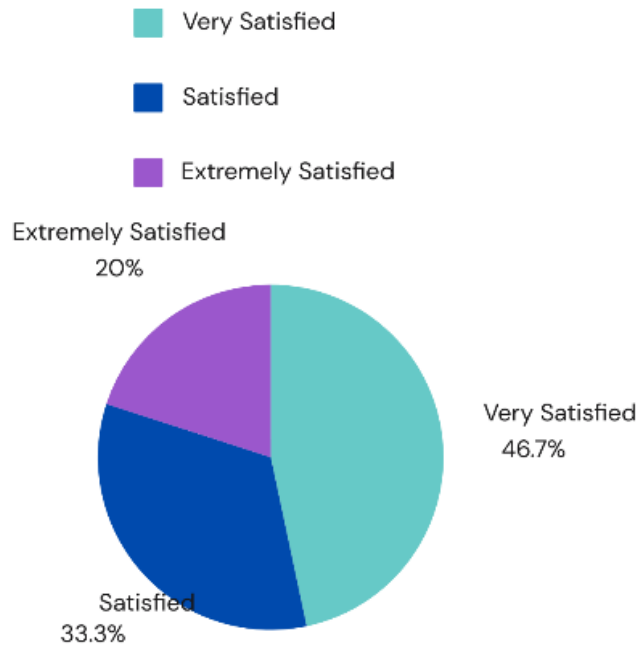
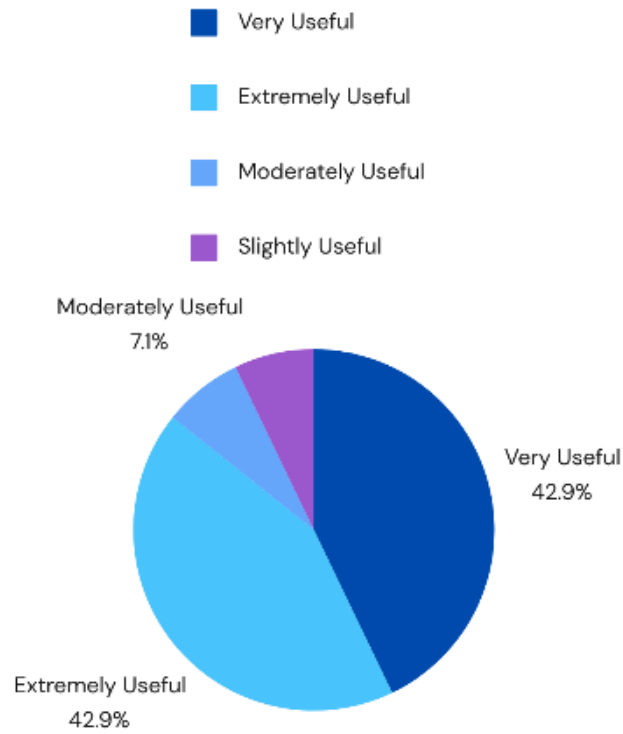


Figure 5:
Ratings of the usefulness of the AI teacher.



Finally, the activities used to test learners' knowledge was enjoyed. Learners found the interface easy to focus on with little to no questions being asked on its usability. The most questions on a feature's usability were on how to ask questions to the AI teacher where most candidates used type form instead of voice.

Discussion

OIAI is a new tech tool with a unique interface and despite a lack of familiarity with the interface learners demonstrated a remarkable ability to communicate effectively with the AI teacher and use the platform effectively. This was shown by the significant drop of time taken to complete one lesson and also their keen interest on using the AI teacher. In addition, learners asked many questions to the AI showing high engagement. Upon reviewing the chat interactions between the learners and the AI, it became clear that their questions had nothing to do with confusion about the content or lack of clarity in the content, but were related to wanting to know more and wanting to apply the content to their own personal teaching styles. Furthermore, the study showed high satisfaction scores (66.7%) and high usefulness scores (85.8%) indicating that the use of an AI teacher is beneficial for personal development and lifelong learning. The study opens a discussion on the scalability of using AI teachers for widespread educational development and scalability of training in line with recent research (Seo et al., 2021). In addition, it opens doors to use AI systems within classroom settings too, although this was not tested in this study. It also addresses barriers such as technological access and acceptance among traditional educators as the AI showed ease of use and more engagement.

Ethical aspects such as user data privacy and potential bias of the AI model are critical considerations in the design, deployment, and use of AI technologies. In this study, the language model used was a fine-tuned Large Language Model (LLM) focusing on teaching and learning which has been used in other research (Aditya, Otermans, & Pereira, 2021; Aditya, Silvestri, & Otermans, 2024). In terms of any bias in the output, this was mitigated as the AI-generated output was only based on the vetted content provided. In addition, the human was always kept in the loop as they could edit the AI-generated content and activities using a dashboard before these were published to the learners. The data of the users were kept in a secure server known by all organisations taking part. Furthermore, the study was conducted following formal ethics approval processes.

The sample used in this study only consisted of Indian teachers and this is limitation of the study. Future studies could also be conducted to see the efficacy of the model in other states of India and then in other countries with other cultural and educational contexts. A concrete next step for the researchers is to replicate the current study for nursery teachers in Chile using a Spanish version of the AI system. Also, future research could expand to different types of educators (e.g., primary school, secondary school and university level). Moreover, future research could explore the use of such an AI system within a classroom setting. In addition, future research could explore the long-term impact of AI-assisted training on teacher performance and student outcomes, along with the integration of AI into various educational levels and subjects.

Conclusion

The use of an AI teacher using a specialised language model for teaching, OIMISA7B, demonstrates a promising avenue for enhancing teacher training and education quality. This approach not only offers a scalable solution to upskill educators but also enriches the learning experience, paving the way for a more innovative and efficient education system; thereby becoming a stepping stone to democratising learning.

References

- Aditya, D., Otermans, P. C. J., and Pereira, M. M. (2021). "An artificial intelligence virtual trainer to serve the underserved and make them employable," in *EDULEARN21 Proceedings*, 11092–11099. doi: 10.21125/edulearn.2021.2301
- Aditya, D., Silvestri, K., & Otermans, P.C.J. (2024). Can AI teach me employability? A multi-national study in three countries. *Frontiers in Artificial Intelligence*, 7. <https://doi.org/10.3389/frai.2024.1461158>
- Bearman, M., Luckin, R. (2020). Preparing University Assessment for a World with AI: Tasks for Human Intelligence. In: Bearman, M., Dawson, P., Ajjawi, R., Tai, J., Boud, D. (eds) *Re-imagining University Assessment in a Digital World. The Enabling Power of Assessment*, vol 7. Springer, Cham. https://doi.org/10.1007/978-3-030-41956-1_5
- Campolo, A., Sanfilippo, M. R., Whittaker, M., & Crawford, K. (2017). AI now 2017 report. https://ainowinstitute.org/AI_Now_2017_Report.pdf
- GluoksnYTE, O., White, C., Žitkus, M. (2024). Possible Impacts on Education Provision of the Transformative Role of Artificial Intelligence in Education: Current Student and Teacher Perspectives. *IJIRMPS Special Issue - International Conference on Trends and Innovations in Management, Engineering, Sciences and Humanities*. <https://doi.org/gt3x3n>
- Harayama, Y., Milano, M., Baldwin, R., Antonin, C., Berg, J., Karvar, A., Wyckoff, A. (2021). Artificial Intelligence and the Future of Work. In: Braunschweig, B., Ghallab, M. (eds) *Reflections on Artificial Intelligence for Humanity. Lecture Notes in Computer Science()*, vol 12600. Springer, Cham. https://doi.org/10.1007/978-3-030-69128-8_4
- Holmes, W., & Anastopoulou, S. (2019). What do students at distance universities think about AI?. In *Proceedings of the Sixth (2019) ACM Conference on Learning@ Scale* (pp. 1-4). <https://doi.org/10.1145/3330430.3333659>
- Idroes, G. M., Noviandy, T. R., Maulana, A., Irvanizam, I., Jalil, Z., Lensoni, L., & Idroes, R. (2023). Student perspectives on the role of artificial intelligence in education: A survey-based analysis. *Journal of Educational Management and Learning*, 1(1), 8-15. <https://doi.org/10.60084/jeml.v1i1.58>
- Jordan, K. (2015). Massive open online course completion rates revisited: Assessment, length and attrition. *International Review of Research in Open and Distributed Learning*, 16(3), 341-358, <https://doi.org/10.19173/irrodl.v16i3.2112>
- Lau, J., Bonilla, J. L., & Gárate, A. (2019). Artificial Intelligence and Labor: Media and Information Competencies Opportunities for Higher Education. In: Kurbanoglu, S., et al. *Information Literacy in Everyday Life. ECIL 2018. Communications in Computer and Information*

- Science, vol 989. Springer, Cham. https://doi.org/10.1007/978-3-030-13472-3_58
- Nesterowicz, K., Bayramova, U., Fereshtehnejad, S. M., Scarlat, A., Ash, A., Augustyn, A. M., & Szádeczky, T. (2022). Gamification increases completion rates in massive open online courses. *International Journal of Information and Communication Technology Education (IJICTE)*, 18(1), 1-12, 10.4018/IJICTE.294447
- Paleczna, M., & Szmigielska-Siuta, B. (2020). Avatars in education: age differences in avatar customization. *Psychology and Education*, 57(3), <http://psychologyandeducation.net/pae/index.php/pae/article/view/141>
- 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), 1-23, <https://doi.org/10.1186/s41239-021-00292-9>
- Thomson, S. R., Pickard-Jones, B. A., Baines, S., & Otermans, P. C. (2024). The impact of AI on education and careers: What do students think?. *Frontiers in Artificial Intelligence*, 7. <https://doi.org/10.3389/frai.2024.1457299>
- Vavekanand, R. (2024). Impact of Artificial Intelligence on students and ethical considerations in education. *Available at SSRN 4819557*. <https://papers.ssrn.com/sol3/Delivery.cfm?abstractid=4819557>