

APPLICATION OF ARTIFICIAL INTELLIGENCE IN TEACHER SUPPORT AND PROFESSIONAL DEVELOPMENT

BY

AYENI AMOS IYANG (Ph.D)
DEPARTMENT OF ECONOMICS
FEDERAL COLLEGE OF EDUCATION, OBUDU
Email Address: iyangamos@gmail.com
07039148651, 08058647849, 08053137916

ESHABI, PIUS K.
DEPARTMENT OF ECONOMICS
FEDERAL COLLEGE OF EDUCATION, OBUDU
08024609735

•
AND

HILAY, ESHIDENANG USHIE,
DEPARTMENT OF ECONOMICS
FEDERAL COLLEGE OF EDUCATION, OBUDU
Email Address: ushiehilary@gmail.com
09032021751

Abstract

Artificial Intelligence (AI) is increasingly recognized as a transformative tool in education, offering innovative approaches to teacher support and professional development. Traditional models of professional development, such as workshops and seminars, have often been criticized for their generalized content, limited follow-up, and low impact on instructional quality. This paper examines the application of AI in enhancing teacher effectiveness by providing personalized learning pathways, real-time instructional feedback, collaborative professional learning communities, administrative support, and opportunities for reflective practice. Drawing on recent literature, the study highlights the ways in which AI can improve teacher competence, facilitate evidence-based decision-making, and promote continuous professional growth. The paper also identifies key challenges to AI integration, including digital literacy gaps, data privacy concerns, infrastructural limitations, contextual relevance, and teacher acceptance. Recommendations are proposed to address these challenges, emphasizing comprehensive teacher training, ethical guidelines, equitable access to technology, contextual adaptation, and the balance between AI insights and human pedagogical judgment. The findings suggest that, when implemented thoughtfully and ethically, AI has significant potential to transform professional development, empower teachers, and improve teaching and learning outcomes across diverse educational contexts.

Introduction

Education in the 21st century has entered an era defined by rapid technological advancements, globalization, and increasingly diverse student populations. Teachers, as central actors in the educational process, are confronted with the dual challenge of delivering high-quality instruction while simultaneously adapting to evolving pedagogical approaches and integrating

technology into their classrooms. Traditional methods of teacher professional development often consisting of one-time workshops, seminars, or standard in-service training programs have been widely criticized for their limited effectiveness. These conventional approaches tend to adopt a “one-size-fits-all” model that fails to address the unique strengths, weaknesses, and contextual needs of individual teachers. As a result, educators often struggle to apply new strategies effectively, which can hinder both their professional growth and the learning outcomes of their students (Darling-Hammond, Hyler, and Gardner, 2017).

Artificial Intelligence (AI) has emerged as a powerful tool with the potential to transform teacher support and professional development. AI encompasses computational systems capable of performing tasks traditionally requiring human intelligence, including reasoning, problem-solving, learning, and pattern recognition (Russell and Norvig, 2021). In the educational context, AI can analyze vast datasets, identify trends, and generate insights that inform decision-making. While the use of AI in personalized learning for students has received significant attention, its application in supporting teachers is equally critical. AI technologies can provide tailored professional development, enhance instructional planning, reduce administrative workload, and facilitate reflective teaching practices. By leveraging AI, schools and educational institutions can adopt a more data-driven, adaptive, and responsive approach to teacher development, which is aligned with modern educational demands.

The rationale for integrating AI into teacher support is grounded in several key considerations. First, teacher effectiveness is widely recognized as a major determinant of student achievement. Studies show that teachers' instructional quality, classroom management skills, and professional competencies directly influence student learning outcomes (Hanushek and Rivkin, 2010). Therefore, improving teacher capacity through continuous, targeted, and effective professional development is essential. Second, the complexity of contemporary classrooms characterized by diverse learning needs, digital literacy gaps among students, and the need for differentiated instruction requires that teachers have access to timely, relevant, and practical support. AI offers scalable solutions that can provide individualized guidance, identify areas for improvement, and suggest evidence-based strategies, thus bridging gaps that traditional professional development often leaves unaddressed.

Furthermore, AI can facilitate innovative forms of collaborative learning and professional networking among educators. Professional Learning Communities (PLCs), peer mentoring, and video-based coaching platforms powered by AI can connect teachers with peers and experts, provide feedback on instructional strategies, and foster a culture of reflective practice. For instance, AI can analyze classroom video recordings to highlight patterns of teacher-student interactions, time spent on various instructional activities, and levels of student engagement, enabling teachers to make informed adjustments to their pedagogy. This reflective approach empowers educators to continuously evaluate and enhance their teaching practices, contributing to sustained professional growth. Despite its potential, the integration of AI into teacher support and professional development is not without challenges. Issues such as digital literacy among teachers, ethical considerations related to data privacy, infrastructure limitations, and the financial costs associated with implementing AI systems must be carefully addressed. Moreover, the success of AI-driven professional development depends on its alignment with local educational policies, curricula, and cultural contexts. Without careful planning, AI tools risk becoming ineffective or even counterproductive, reinforcing inequalities in teacher capacity and access to resources.

AI and Personalized Teacher Development

Personalized teacher development is one of the most impactful ways AI supports educators. Traditional professional development programmes often rely on uniform workshops or seminars that treat teachers as a homogeneous group, offering generalized content that rarely aligns with individual needs, experience levels, or teaching contexts (Darling-Hammond, Hyler, and Gardner, 2017). Such approaches have been criticized for their limited effectiveness because they fail to

address the specific instructional challenges that teachers encounter daily. AI offers a transformative solution by enabling the design of adaptive and personalized professional learning pathways tailored to each educator's unique strengths and weaknesses.

AI-driven platforms analyze a range of data points, including classroom teaching practices, lesson delivery methods, student engagement patterns, and assessment results. By processing this information through machine learning algorithms, AI systems can identify areas where a teacher excels and areas requiring improvement. For example, a teacher who demonstrates strong content knowledge but struggles with student engagement may be recommended targeted strategies for interactive instruction or student-centered learning approaches. Conversely, novice teachers may be guided toward classroom management techniques or foundational pedagogical practices. This ensures that professional development is no longer a one-size-fits-all experience but a precise, data-driven process.

Several AI-based platforms exemplify the potential of personalized professional development. Edthena, for instance, allows teachers to upload videos of their classroom teaching, which AI then analyzes to provide feedback on questioning strategies, interaction patterns, and engagement levels. This is complemented by recommendations for relevant courses, instructional resources, and coaching sessions tailored to each teacher's needs. Similarly, Courser for Educators employs AI to suggest micro-courses based on a teacher's prior experience, skill gaps, and instructional context. By providing continuous, individualized guidance, these systems empower teachers to engage in professional development at their own pace and focus on areas that will have the greatest impact on their practice.

Khosravi (2019) found that educators who received AI-driven, adaptive training demonstrated improved classroom practices and were better able to implement innovative teaching strategies. Teachers reported that targeted recommendations were far more practical and actionable than traditional workshops, which often lack follow-up or contextual relevance. Furthermore, AI systems allow for iterative learning, enabling teachers to reflect on their practice, receive feedback, and adjust their teaching strategies over time. This continuous cycle of assessment, feedback, and improvement aligns with contemporary models of effective teacher professional development.

Beyond skill enhancement, AI-supported personalized development has the potential to address equity in teacher support. Schools in low-resource areas often struggle to provide high-quality, individualized professional development due to budgetary and logistical constraints. AI platforms can deliver targeted training remotely, offering teachers access to high-quality resources regardless of geographic location. This democratization of professional development ensures that all teachers, regardless of their school context, can benefit from personalized, data-informed guidance.

AI in Instructional Support and Feedback

Artificial Intelligence plays a critical role in providing instructional support and feedback, transforming how teachers plan, deliver, and evaluate their lessons. Effective teaching is not solely dependent on a teacher's knowledge of content but also on their ability to adapt instruction in real time, respond to student needs, and engage learners actively. Traditional methods of instructional evaluation, such as periodic classroom observations or standardized student assessments, often provide delayed or generalized feedback, limiting the teacher's ability to make timely improvements (Baker and Siemens, 2014). AI addresses these limitations by offering continuous, data-driven insights that guide instructional decisions and improve teaching effectiveness.

One of the primary ways AI supports instructional improvement is through classroom analytics. AI systems can collect and process vast amounts of classroom data, including student responses, participation patterns, engagement levels, and interaction dynamics. Using this information, AI generates detailed reports on instructional practices and identifies areas that require attention. For example, AI can detect if a teacher is dominating classroom discussion, if students are disengaged during certain activities, or if specific instructional strategies are consistently yielding

lower learning outcomes. Such precise feedback enables teachers to adjust their teaching methods promptly, creating a more responsive and student-centered learning environment.

AI tools also enhance feedback on student work, a critical component of instructional effectiveness. Automated grading systems, such as GradeScope and Turnitin's AI-powered tools, allow teachers to evaluate assignments efficiently while providing detailed analytics on common errors and misconceptions. These platforms can highlight trends in student understanding, enabling teachers to identify which concepts need reinforcement and which instructional strategies are most effective. This real-time, evidence-based feedback loop not only reduces teacher workload but also promotes informed instructional decision-making, ensuring that teaching is both adaptive and targeted to student needs (Luckin, 2016). Another significant contribution of AI in instructional support is its ability to facilitate differentiated instruction. Classrooms are increasingly diverse, with students exhibiting varying learning styles, abilities, and prior knowledge. AI can analyze individual student performance and engagement data to provide teachers with recommendations for tailoring instruction. For instance, AI can suggest small-group interventions, alternative learning activities, or adaptive resources for students who require additional support. By integrating these recommendations into daily lesson planning, teachers can ensure that every student receives instruction that is appropriately challenging and supportive, fostering greater engagement and learning outcomes.

AI-driven feedback systems also enhance reflective practice, a critical element of professional growth. Platforms such as TeachFX employ AI to analyze teacher talk patterns, questioning techniques, and the balance of interaction between teacher and students. By reviewing these analytics, teachers can gain a clearer understanding of their instructional strengths and weaknesses, reflect on their teaching strategies, and implement improvements. Unlike traditional feedback, which may be infrequent and subjective, AI provides objective, continuous, and actionable insights, making reflective practice more effective and evidence-based.

Furthermore, AI in instructional support extends beyond individual classrooms. School-wide analytics can identify broader trends, such as common areas of student misunderstanding or recurring challenges in instructional delivery. This allows administrators and professional development coordinators to design training programs or interventions that address systemic instructional issues, complementing individualized teacher support and fostering school-wide improvement.

AI and Collaborative Professional Learning Communities

Collaboration is widely recognized as a cornerstone of effective teacher professional development. Teachers who engage in professional learning communities (PLCs), peer mentoring, and collaborative reflection are more likely to adopt innovative instructional practices, improve their teaching effectiveness, and sustain continuous professional growth (Vescio, Ross, & Adams, 2008). However, traditional collaboration methods often face logistical constraints, including limited opportunities for teachers to connect beyond their schools, unequal access to expert mentors, and difficulties in tracking and applying feedback from peer interactions. Artificial Intelligence provides innovative solutions to these challenges by facilitating more dynamic, scalable, and data-driven collaborative professional learning.

AI enhances collaboration by analyzing teacher data and recommending professional connections, discussion topics, and resources tailored to individual needs. Machine learning algorithms can identify teachers facing similar instructional challenges or teaching in comparable contexts and connect them for targeted peer support. For instance, AI systems can recommend mentors who have successfully implemented strategies in areas where a teacher seeks improvement, or highlight discussion threads and resources that align with a teacher's professional goals. This targeted networking ensures that collaborative learning is meaningful, relevant, and actionable, rather than generic or sporadic.

Video-based coaching platforms represent a key application of AI in collaborative

professional learning. Platforms such as Edthena allow teachers to upload recordings of their classroom lessons, which AI analyzes to provide automated feedback on instructional techniques, student engagement, and questioning strategies. This AI-generated analysis is then supplemented by peer review and mentor input, creating a blended approach to feedback that combines the efficiency of technology with the depth of human reflection. Teachers can engage asynchronously with their peers, discuss insights, and share strategies, fostering a professional dialogue that transcends geographic and time limitations. This approach democratizes access to high-quality mentoring and collaborative learning opportunities, especially for teachers in remote or underserved areas.

In addition to connecting individual teachers, AI can support school-wide or district-level collaborative learning initiatives. By aggregating classroom data across multiple educators, AI can identify trends in teaching practices, highlight effective strategies, and facilitate the sharing of best practices. For example, if several teachers in a district demonstrate success using a particular interactive teaching method, AI can recommend that strategy to other educators with similar student populations or instructional challenges. This data-driven approach promotes collective learning and contributes to continuous improvement at both individual and systemic levels.

AI for Administrative and Time-Management Support

The major barriers to effective teacher professional development are the significant administrative workload that educators face daily. Teachers are responsible not only for instructional planning and delivery but also for grading, scheduling, preparing reports, managing communications with parents and students, and fulfilling various bureaucratic obligations. Research indicates that administrative duties can consume up to 50% of a teacher's time, leaving limited opportunities for instructional reflection, innovation, and professional growth (OECD, 2019). Artificial Intelligence offers a practical solution to this challenge by automating routine administrative tasks, thereby freeing teachers to focus on teaching and professional development activities.

Scheduling and organizational management also benefit significantly from AI. Intelligent systems can generate class timetables, coordinate parent-teacher meetings, and send reminders for deadlines or important events. AI-powered chatbots can handle routine inquiries from students and parents, such as questions about assignments, class schedules, or school policies. This reduces the constant administrative burden on teachers and allows them to focus on higher-order teaching responsibilities. By streamlining routine communication and logistical tasks, AI contributes to a more efficient and productive teaching environment.

Beyond efficiency, AI-supported administrative tools also promote consistency and accuracy in record-keeping. Traditional manual systems are prone to errors, including misreported grades, overlooked attendance, or mismanaged student data. AI systems minimize such errors through automation and real-time updates, ensuring that information is accurate and accessible. This reliability not only saves time but also enhances the overall management of school operations, indirectly supporting teacher effectiveness.

AI-driven administrative support further contributes to teacher well-being and job satisfaction. Studies show that administrative overload is strongly associated with teacher burnout, stress, and attrition (Skaalvik and Skaalvik, 2017). By taking over repetitive, time-consuming tasks, AI reduces cognitive load, mitigates stress, and creates more space for reflective practice and professional growth. Teachers are therefore able to engage more meaningfully in professional learning communities, implement innovative instructional strategies, and focus on student-centered teaching. Despite these advantages, AI-based administrative systems require careful implementation. Schools must ensure reliable infrastructure, such as stable internet access and compatible hardware, for these systems to function effectively. Teacher training is also critical; educators must understand how to use AI platforms, interpret analytics, and integrate automated outputs into their work flows. Moreover, ethical considerations related to data privacy,

confidentiality, and security must be addressed, as these systems handle sensitive student and teacher information (Williamson and Piattoeva, 2019).

Challenges of AI in Teacher Support

These challenges are;

1. **Digital Literacy and Teacher Competence:** One of the primary challenges of integrating AI into teacher support is the varying levels of digital literacy among educators. While AI tools offer sophisticated analytics and personalized recommendations, teachers must possess the skills to interpret data accurately and translate insights into actionable instructional strategies (Ertmer and Ottenbreit-Leftwich, 2010). In cases where digital competence is low, AI platforms risk being underutilized or misinterpreted, limiting their effectiveness. Professional development initiatives that incorporate AI must therefore include comprehensive training programs that develop educators' technological proficiency alongside pedagogical application.
2. **Ethical and Data Privacy Concerns:** AI systems rely heavily on large amounts of sensitive data, including student performance records, classroom videos, and teacher instructional practices. This dependence raises significant ethical and privacy concerns. Data breaches, unauthorized access, and misuse of information could compromise the confidentiality of both students and educators (Williamson and Piattoeva, 2019). Moreover, teachers may feel surveilled or evaluated in ways that are intrusive or unfair, which can affect their engagement with AI tools. To mitigate these risks, robust policies must govern data collection, storage, and usage, ensuring that AI supports professional growth without violating ethical standards.
3. **Infrastructure and Cost Limitations:** Effective deployment of AI in education requires reliable infrastructure, including stable internet connectivity, compatible hardware, and sufficient computational capacity. Schools in low-resource or rural areas often lack these essential technological foundations, creating inequities in access to AI-based teacher support (Zawacki-Richter, 2019). Additionally, the cost of acquiring, maintaining, and updating AI platforms can be prohibitive for many educational institutions. Without careful planning and financial investment, AI initiatives may exacerbate existing disparities in teacher development opportunities rather than alleviate them.
4. **Contextual and Cultural Relevance:** AI tools are often developed in specific educational contexts or countries, which may limit their applicability in other regions. Recommendations generated by AI systems may not align with local curricula, cultural norms, or pedagogical expectations, reducing their relevance and effectiveness (Luckin et al., 2016). For instance, an AI platform designed for classrooms in technologically advanced urban schools may offer suggestions that are impractical or unfeasible in under-resourced rural settings. Therefore, adaptation and contextualization of AI tools are essential to ensure that they meet the specific needs of educators and students in diverse environments.
5. **Teacher Resistance and Acceptance:** Even when AI systems are technically sound and contextually adapted, teacher acceptance remains a critical factor. Educators may be skeptical of AI due to fear of job displacement, concerns about autonomy, or uncertainty regarding the accuracy of AI recommendations (Holmes, 2019). Resistance can also stem from a lack of trust in technology or a preference for traditional, human-mediated professional development. Overcoming these barriers requires participatory approaches in AI implementation, where teachers are involved in the design, adaptation, and evaluation of AI tools, ensuring that these technologies are viewed as supportive rather than intrusive.
6. **Maintaining Ethical Pedagogical Balance:** A related challenge is ensuring that AI does not replace critical human elements in teaching, such as judgment, empathy, and contextual decision-making. While AI can provide analytical insights and recommendations, it cannot fully capture the nuances of classroom dynamics, socio-emotional needs of students, or the ethical considerations inherent in teaching. Educators must therefore use AI as a supplement rather than a substitute for professional expertise, maintaining a balance between technological guidance and human pedagogical judgment.

Ways Forward on the Challenges of AI in Teacher Support

Addressing these challenges requires deliberate strategies and coordinated efforts by educational institutions, policymakers, and technology providers. These includes;

a. Enhancing Digital Literacy and Teacher Competence: One of the most critical steps in overcoming AI-related challenges is investing in comprehensive digital literacy training for teachers. Professional development programs should include modules on interpreting AI-generated insights, utilizing AI-driven platforms effectively, and integrating data-informed strategies into classroom practice (Ertmer & Ottenbreit-Leftwich, 2020). Institutions can organize workshops, webinars, and hands-on sessions that allow teachers to engage directly with AI tools in simulated and real classroom environments. Mentorship programs pairing technologically adept educators with peers can also foster peer learning, gradually increasing competence and confidence in using AI for professional growth.

b. Establishing Ethical Standards and Data Privacy Protocols: Ethical and privacy concerns represent a significant barrier to AI adoption in teacher support. Schools and educational authorities should implement clear policies governing the collection, storage, and use of data. This includes anonymizing student information, securing access controls, and ensuring transparency about how AI-generated insights will be used (Williamson & Piattoeva, 2019). Educators should also be trained in ethical data handling practices to safeguard sensitive information. Additionally, institutions can engage stakeholders including teachers, parents, and students in discussions about ethical AI use, fostering trust and acceptance of AI tools.

c. Improving Infrastructure and Reducing Cost Barriers: Infrastructural limitations, such as inadequate internet connectivity, outdated hardware, and insufficient computational capacity, hinder effective AI integration. Governments, school administrations, and technology providers must collaborate to ensure that necessary infrastructure is in place. This may include subsidizing AI platforms for under-resourced schools, investing in robust internet networks, and providing technical support. Cloud-based AI systems can also reduce the need for expensive local hardware, allowing schools to leverage AI tools without significant capital expenditure. Strategic partnerships with educational technology companies can further enhance access to affordable, high-quality AI solutions.

d. Contextualization and Cultural Relevance: AI tools must be adapted to align with local curricula, cultural norms, and pedagogical practices to be effective. Developers should work closely with educators to customize AI recommendations to specific educational contexts (Luckin et al., 2016). For example, lesson planning suggestions, classroom management techniques, or student engagement strategies should reflect local instructional expectations and cultural values. Pilot programs can be conducted to test AI interventions, gather feedback, and iteratively refine the tools to ensure they are contextually relevant and practically applicable.

e. Promoting Teacher Acceptance and Trust: Overcoming resistance to AI requires building teacher trust and demonstrating the value of these tools. Schools should involve teachers in the design, selection, and evaluation of AI platforms to ensure that they meet real classroom needs and do not threaten professional autonomy (Holmes, 2019). Providing clear evidence of AI's benefits such as time saved, improved student outcomes, and personalized professional development can increase buy-in. Additionally, a gradual, supportive implementation process, rather than abrupt mandates, allows teachers to adapt and integrate AI at their own pace.

f. Maintaining Human-Centered Pedagogy: Finally, while AI provides valuable insights and automation, it must complement rather than replace human judgment, creativity, and empathy in teaching. Teachers should be encouraged to use AI as a reflective and decision-support tool, integrating its recommendations into broader pedagogical considerations. Continuous professional development should emphasize the synergy between AI analytics and human expertise, ensuring that instructional decisions remain student-centered and ethically grounded.

Conclusion

Artificial Intelligence (AI) has emerged as a transformative tool in education, offering unprecedented opportunities to enhance teacher support and professional development. The literature reviewed demonstrates that AI can provide personalized professional learning pathways, deliver real-time instructional feedback, facilitate collaborative professional learning communities, streamline administrative tasks, and support reflective practice. By leveraging data-driven insights, AI empowers teachers to make informed decisions, adapt instructional strategies, and continuously improve their professional competence. The integration of AI into teacher development not only enhances individual effectiveness but also has the potential to improve school-wide instructional quality and student learning outcomes.

However, the successful implementation of AI in education is contingent upon addressing multiple challenges. Digital literacy gaps, ethical and data privacy concerns, infrastructural limitations, contextual relevance, and teacher acceptance are significant barriers that require careful planning and strategic interventions. Without deliberate measures to address these issues, AI risks being underutilized, misapplied, or even detrimental to professional development efforts. Educational institutions must therefore invest in teacher training, establish ethical guidelines, ensure equitable access to technology, and adapt AI tools to local curricula and cultural contexts. These measures are essential to creating an enabling environment in which AI can function as a supportive, rather than intrusive, tool.

Furthermore, the integration of AI in teacher support should maintain a human-centered approach. While AI provides valuable analytics, recommendations, and automation, it cannot replace the professional judgment, empathy, and contextual understanding that human teachers bring to the classroom. The optimal model of AI-assisted professional development combines technological insights with reflective practice, collaboration, and human expertise. This balance ensures that AI enhances rather than undermines the pedagogical process, fostering a culture of continuous learning, innovation, and professional growth.

Recommendations

Based on the findings of the study, the following recommendations were made;

1. Educational institutions should implement ongoing professional development programs that focus on digital literacy, data interpretation, and the practical application of AI insights in the
2. Governments and school administrations should prioritize investments in technological infrastructure, particularly in under-resourced and rural schools, to ensure equitable access to AI tools
3. AI tools should be customized to reflect local educational contexts, curricula, and cultural norms
4. Professional development programs should emphasize the integration of AI insights with reflective practice, collaborative learning, and teacher expertise, maintaining a human-centered approach to professional growth.
5. Educational institutions should regularly assess the effectiveness, usability, and impact of AI tools on teacher performance and student outcomes.

REFERENCES

- Baker, R. S., & Siemens, G. (2014). Educational data mining and learning analytics. In R. K. Sawyer (Ed.), *The Cambridge handbook of the learning sciences* (2nd ed., pp. 253–272). Cambridge University Press.
- Darling-Hammond, L., Hyler, M. E., & Gardner, M. (2017). *Effective teacher professional development*. Palo Alto, CA: Learning Policy Institute.
- Ertmer, P. A., & Ottenbreit-Leftwich, A. T. (2010). Teacher technology change: How knowledge, confidence, beliefs, and culture intersect. *Journal of Research on Technology in Education*, 42(3), 255–284.
- Ertmer, P. A., & Ottenbreit-Leftwich, A. T. (2020). Teacher technology integration and professional development in the digital age. *Educational Technology Research and Development*, 68(5), 1–18.
- Hanushek, E. A., & Rivkin, S. G. (2010). Generalizations about using value-added measures of teacher quality. *American Economic Review*, 100(2), 267–271.
- Holmes, W., Bialik, M., & Fadel, C. (2019). *Artificial intelligence in education: Promises and implications for teaching and learning*. Boston: Center for Curriculum Redesign.
- Johnson, L., Adams Becker, S., Cummins, M., Estrada, V., Freeman, A., & Hall, C. (2016). *NMC horizon report: 2016 higher education edition*. Austin, Texas: The New Media Consortium.
- Khosravi, H., Kitto, K., & Cooper, K. (2019). Artificial intelligence in education: Emerging technologies and their potential for teacher professional development. *Educational Technology Research and Development*, 67(4), 845–867.
- Luckin, R. (2016). *Machine learning and human intelligence: The future of education for the 21st century*. London: UCL Institute of Education Press.
- Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. (2016). *Intelligence unleashed: An argument for AI in education*. London: Pearson Education.
- Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. (2016). *Intelligence unleashed: An argument for AI in education*. London: Pearson Education.
- OECD. (2019). *TALIS 2018 results (Volume I): Teachers and school leaders as lifelong learners*. Paris: OECD Publishing.
- Russell, S., & Norvig, P. (2021). *Artificial intelligence: A modern approach* (4th ed.). Hoboken, NJ: Pearson Education.
- Selwyn, N. (2019). *Should robots replace teachers? AI and the future of education*. Cambridge: Polity Press.

- Skaalvik, E. M., & Skaalvik, S. (2017). Motivated for teaching? Associations with school goal structure, teacher self-efficacy, job satisfaction and emotional exhaustion. *Teaching and Teacher Education*, 67, 152–160.
- Vescio, V., Ross, D., & Adams, A. (2008). A review of research on the impact of professional learning communities on teaching practice and student learning. *Teaching and Teacher Education*, 24(1), 80–91.
- Williamson, B., & Piattoeva, N. (2019). Objectivity as standardization in data-scientific educational governance: *Technologies of accountability and the implications for education policy*. *Educational Policy*, 33(1), 145–167.
- Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education. *International Journal of Educational Technology in Higher Education*, 16(1), 1–27.