

Local Voices, Global Technologies: AI Integration Barriers in K–12 Classrooms

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ABSTRACT

This study examined the barriers that K–12 schools face when implementing artificial intelligence (AI) in their lessons. Thirty-five educators from public and private schools were selected through snowball sampling to participate in discussions and written tasks designed to prompt them to think critically about how AI can be applied in education. The study of themes revealed five main types of barriers. Aside from not having enough psychological support, educators also have issues with their feelings and sense of who they are in relation to AI integration. They have mixed feelings about using AI, and there is a need for more information on how to utilize AI in a manner that is moral, culturally acceptable, and beneficial for growth. There are also not enough training opportunities that work with flexible schedules. Educators need to know how to use AI. Still, they also need to be mentally prepared, aware of its ethical implications, and open to other cultures, as evidenced by the numbers. This research emphasizes the importance of implementing a fair digital transformation that aligns with the country's educational regulations, respects local values, and prioritizes child safety.

Keywords: education, artificial intelligence, K-12

INTRODUCTION

Adding artificial intelligence (AI) to schools around the world has made some people very excited and some very scared. Many teachers want to use AI to help students learn and improve their work (Velandar et al., 2024; Cheng & Wang, 2023), but some issues need to be addressed first. Tech changes quickly, and schools that train teachers often fall behind. This makes teachers, both new and old, unprepared (Vazhayil et al., 2019; Renz & Hilbig, 2020). It is hard to adopt because of issues with the curriculum, strict testing systems, and moral concerns about unfair computer programs and monitoring. It is not always fair to use AI due to cultural differences, limited access to education, and unclear rules (Masunungure & Maguvhe, 2025; Mavrogenis et al., 2024), especially in education and casual learning settings.

Teachers have a hard time because their schools are not set up well, and there are no AI tools that are fitting for culture. They say they do not want to because they do not want to lose control of the lessons and worry that their students will depend too much on them (Mehdaoui, 2024; Pratiwi et al., 2021). A lot of the time, AI systems do not consider the different languages and social issues that occur in Filipino schools, especially in poor and mixed areas (Elliott & Kim, 2025; Fitas, 2025). Special education teachers also struggle with tools that are difficult to use and with questions of right and wrong when it comes to data use. There are no institutional rights for teachers when the law is unclear (Starks & Reich, 2023; Munoriyarwa, 2024).

An awful lot of research has been done on AI in schools, but we still do not know how Filipino teachers deal with these issues every day. A lot of the time, modern studies do not examine how complex cultural, structural, ethical, and emotional factors interact in the Global South. Instead, it makes broad assumptions about all areas or focuses on places with lots of technology. Not much research has been done on Filipino teachers' views, especially in K–12 schools, where using AI in the classroom runs counter to traditional teaching practices and is constrained by how the system operates.

This study's goal is to close that gap by looking at how Filipino teachers actually use AI in the classroom. That the study looked at their fears, plans, and goals adds to what we know about AI in schools. It is clear that educators and policymakers need to understand different societies, do the right thing, and help people feel better. AI should be used with people, not instead of them, in an educational system that supports local values, empowers teachers, keeps kids safe, and puts people first.

Problem Statement

AI has much promise to make things more efficient, easier to get an education, and more personalized. However, it is still not entirely a part of K–12 education because of problems with structure, teaching, ethics, and culture. Teachers across a range of situations say there is a lack of infrastructure, poor training, emotional pushback, and goals that are not aligned with the curriculum. Also, AI tools are usually made with Western language and culture in mind. This leaves out students from other language and cultural groups and worsens inequality. These issues have been examined in global studies. However, they need to be discussed in a more specific, interactive way that gives greater weight to teachers' thoughts, cultural differences, and classroom mood. Many things make it hard to use AI together. This study aims to understand how those problems interact and identify situation-based ways to change schooling that will benefit everyone.

Research Objectives

- To find the significant issues that K–12 teachers have with using AI in their lessons and put them into groups. These issues could be technical, pedagogical, social, moral, or cultural.
- To find out how well AI tools work with training methods that are sensitive to and include different cultures, as well as how these methods can be made better.
- To create a framework for equal use of AI, and these ideas fit with that. Also, they showed how strong and clever Filipino teachers are.

Research Questions

- Which of these do teachers think are the most critical issues with using AI in K–12 schools?
- How do the way teachers feel, how ready they think they are to be teachers, and what they think about how to teach affect how they use AI tools?
- What are the pros and cons of using AI in teaching methods that are sensitive to different cultures and include everyone?
- Why do teachers think that using AI in the classroom can be hard? What suggestions do teachers have for making it work?

Literature Review

AI is helpful in education since it can change how we learn, how we teach, and how schools are run. AI needs to be fixed in many ways before it can be used across all stages of education—from K–12 to college—and to train teachers. It was hard to trust AI because it lacked reliable supporting technology. Puniwi et al. (2022) note that schools in poor and rural areas have strict rules, such as prohibiting students from bringing smartphones to class. Old technology, slow internet, and insufficient devices also widen the digital gap (Mehdaoui, 2024; Pratiwi et al., 2025; Woodruff et al., 2023). While people in developed countries are pretty tech-savvy, the infrastructure is still

not very good (Wang & Cheng, 2021). If things are not already getting better, adding AI to schools might make things worse.

For some reason, AI systems are complex to understand and use, not just because of their tools. Generative AI technologies do not help students learn because they are too easy to use or not straightforward enough (Kokoç, 2024; Soleimani et al., 2021). People trust AI even less when it lacks domain-specific training tools and users cannot see what it does (Cheah et al., 2025; Liu et al., 2025). People struggle with AI and do not trust it to make decisions.

Researchers have found that schools that train teachers do not always keep up with new technologies and do not give both new and experienced teachers the AI teaching skills they need (Vazhayil et al., 2019; Renz & Hilbig, 2020; Velandar et al., 2022). Another problem is that teachers do not receive the training they need to apply AI tools in varied educational contexts (Cheng & Wang, 2023). Another problem is that teachers often do not know how to use new technology. The way things are taught and checked no longer works well with AI-based modifications. Regular tests, which are meant to be fair and consistent, do not work with AI because it helps people learn in so many different ways (Qayyum et al., 2025; Tang, 2025). Ayyum et al. (2025) say it is harder to use AI-powered tools in early childhood education due to strict textbook guidelines and unclear rules. The way schools are held accountable does not work with how AI can be used in schools. There are several reasons why some teachers do not want to use AI, some of which involve technology (Mehdaoui, 2024; Pratiwi et al., 2025; Cheng & Wang, 2022; Liu et al., 2021).

In education, AI continues to raise moral questions about what is right and wrong, privacy, and honesty (Williams et al., 2023; Soleimani et al., 2021). Velandar et al. (2024) and Yim (2024) argue that teachers may not question or examine computer data because they do not think critically enough to do so. Ethics are not taught in AI schools, so teachers are not prepared to address these problems. Gago-Galvagno et al. (2025) and Masunungure and Maguvhe (2025) argue that AI systems that draw on ideas from Western languages and cultures can harm less common languages and their teaching methods. There is more bias when it comes to lessons with people from other countries and languages. It is harder for everyone to get into those classes. Some types of students do not do well with AI-based tools (Elliott & Kim, 2025; Fitas, 2025).

AI for special schools has both strengths and weaknesses. Many teachers believe that AI can help them with many lessons. However, it does not always work for kids who are neurodiverse or who have physical issues (Starks & Reich, 2023; Fitas, 2025). Folks are scared of AI and do not know how to use it well, which makes it hard to do well. This shows that AI is more likely to make things worse than better. There are still social issues that need to be dealt with when AI is used in professional and higher education (Allam et al., 2024; Mavrogenis et al., 2024). Many teachers in fields like medicine do not want to make changes because they fear cheating, lower standards, and insufficient support from their schools (Soleimani et al., 2025; Al-Qerem et al., 2023-52). These issues make it clear that each business needs its own set of rules and help tools. AI is not usually used to learn things outside of school, like how to teach someone a language. While AI-enhanced learning experiences could be helpful in school, it might be hard for teachers to use or support them outside of school (Zadorozhnyy et al., 2021). When there are no clear rules, it is harder to use AI. AI rules are hard to find, and the ones that are out there are too new to be useful (Velandar et al., 2024; Munoriyarwa, 2024). It is hard for teachers to do their work and follow the rules because of this. There are still worries about scientific integrity, authorship, and plagiarism, especially regarding data produced by AI (Mavrogenis et al., 2024).

MATERIALS AND METHODS

Research Design

It used a qualitative, interpretivist approach to understand what K–12 teachers really thought about using artificial intelligence (AI) in the classroom. We chose the interpretivist paradigm to focus on what AI technologies meant to teachers personally and how they felt about them, mainly when used in places with diverse cultures and limited resources. Focusing on story depth rather than statistical generalization, the study sought to identify complex, situational barrier types that are hard to see in quantitative research.

Sampling Method

Snowball sampling was used to identify and recruit individuals who had extensively used AI in their real-world teaching. The process began with a small group of teacher leaders and ICT directors who were known to be interested in using technology to teach. These early adopters told their coworkers about AI tools they had used

or how they felt about incorporating them. The last sample consisted of 35 teachers. The teachers in the sample worked at public and private schools in cities, suburbs, and the country. They taught a range of courses and grades. The snowball sampling method also worked really well for collecting voices from groups that do not use technology as much or are less popular.

Data Gathering

Interviews were used to gather the information. The subjects were able to talk about their experiences in their own words, but the main ideas remained the same. Interviews could take place in person or via private videoconferencing, depending on the interviewees and their availability. Every meeting lasted 45 to 60 minutes and was held in English, Filipino, or a nearby language so that everyone could feel at ease. The interview guide asked about personal experiences with AI tools, the most complex parts of integrating AI, how they felt about it (e.g., fear, excitement, or skepticism), and how they thought AI fit into their classes psychologically. Some participants also sent in free reflexive journals, which were either written or recorded reflections on how their thoughts changed after using AI tools or attending professional development events.

Data Analysis

All talks were typed up word-for-word and translated when needed to ensure accuracy and inclusion. To develop a conceptual model in qualitative research, the method by Naeem et al. (2023) was used. It was necessary to learn about the data, write initial code, identify themes, review them, name and define them, and finally write the report. The NVivo program was used to set up the data and assist with coding. It was possible to examine the themes both inductively and deductively. The data led to new ideas, and current research on AI integration barriers was used as a guide for the second step. We looked at patterns across different referral chains to identify similarities and differences, particularly in cultural dissonance, emotional climate, and pedagogical alignment.

Ethical Considerations

Ethical honesty was essential throughout the study. All the people who took part in the study gave their permission after being fully told about its purpose, methods, and their rights as volunteers. The people who took part in the study were told they could quit at any time without problems and that their privacy and anonymity would be protected. Ethically, the institutional review board gave its blessing, and all data were kept safe in accordance with data protection rules. Much care was taken to ensure the people who took part felt safe, mainly when they discussed their worries, fears, or anger about AI.

Reliability

There were several checks that the data could be relied on. Participants were asked to review their transcripts and first readings to boost credibility. To improve transferability, details about the study setting, participant types, and their schools were provided. To maintain reliability, an audit trail was used to document methodological choices, coding processes, and researchers' ideas. To improve data reliability, three sources were used: interviews, notebooks, and books. Reflexive journals were also kept to check for researcher bias and positionality.

RESULTS AND DISCUSSION

Limitations in terms of technology and building

People kept saying that bad technology was the main thing holding AI back. Teachers in semi-rural and rural schools discussed how unstable the internet was, how outdated the hardware was, and how few digital devices were available. For one thing, these rules made it harder to try out AI tools. For another, they widened the gap between schools. One teacher said, "They expect us to use AI when we can't even run simple apps right." Problems with infrastructure have been identified as a significant issue in studies worldwide (Mehdaoui, 2024; Wang & Cheng, 2021).

Even in schools with more resources, people were upset that there were no AI tools for their field. Many platforms were created with Western ideas about teaching in mind, so they do not work well with Filipino students' language and customs. Teachers found it hard to adapt AI-made material to local situations, especially when it came to subjects like Filipino and Araling Panlipunan that have a lot of cultural differences.

Problems with alignment in the classroom and a limited program

One thing that kept coming up was that AI tools do not always work with how schools are currently set up. Teachers thought that the way regular tests were used was wrong because AI could tailor learning to each student. Some people who went talked about how AI-made learning paths were "too flexible" for rigid grading systems,

which made managers confused and upset. It was especially clear in senior high schools, where subject guides are subject to strict rules.

Teachers were also worried about the assumptions that AI systems made about how to teach. An awful lot of tools prioritize speed and getting people information over things like culture, teamwork, and critical thinking. One person said, "AI is fast, but it doesn't know our students." This fits with what Cheah et al. (2025) and Soleimani et al. (2025) found: when AI is used, teachers need to change how they teach.

How to deal with feelings and teacher pushback

What people felt about AI turned out to be a big part of how they used it. Many of the teachers were scared, skeptical, and tired, but some were interested and excited. People often fought back because they thought their jobs were in danger. Like, teachers were afraid they would lose their jobs, not be able to control their classes, or have to rely on hard-to-understand formulas. One person said, "It feels like AI is watching us and not helping us."

Resistance was not always linked to being good at your job. People who were good with technology but not with AI were afraid to use it because it made them feel awkward and raised social issues. Liu et al. (2025) and Pratiwi et al. (2025) stated that this finding underscored the importance of addressing barriers rooted in ideas and psychology.

Barriers like language and culture

People who taught in schools where many different languages were spoken were upset that AI tools did not always work with local accents, native knowledge systems, and culturally based teaching practices. For example, the AI-generated reading materials did not include any references to Filipino culture, history, or slang. Kids did not want to learn because of this, and the teachers were mad.

Also, teachers who worked with students from different countries said it is dangerous to erase cultures. One teacher said, "AI doesn't understand our stories; it tells us someone else's." Along the same lines as Gago-Galvagno et al. (2025) and Elliott & Kim (2025), this study showed that AI tends to make learning more like general learning.

Tips for Getting Through Hard Times

People found ways to get around these issues, even though they existed. These were some of them:

- Teachers in the Philippines pushed for workshops that use local examples and languages to show how AI tools can be used in schools.
- Participatory design: Several people said that teachers, students, and community members should help create AI content that is important to their culture.
- Many people wanted to teach teachers about AI ethics, with a focus on bias, privacy, and teaching that is based on people.
- Teachers liked the idea of gradually introducing AI tools, starting with low-stakes tasks such as creating quizzes or reviewing feedback.

Proposal Framework: Equity of AI Integration in Education

The main goal of the system is to ensure AI integration is fair and works well. When AI is used in education, it's not just about technological improvements; it's also about ensuring fairness, inclusion, long-term sustainability, and if improperly used, this tool will present significant ethical and legal concerns. All areas are linked by the idea of equity, which holds that new ideas should help all students, not just those who are already doing well.

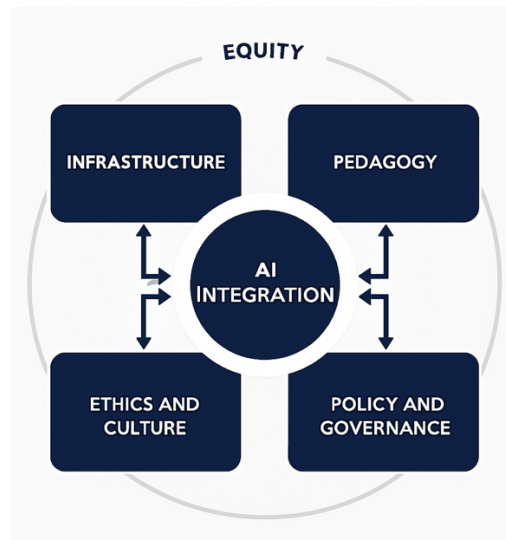


Fig. 1. Equity of AI Integration in Education (Cariaga et al., 2025)

1. The Infrastructure

AI can only work with the right tools. AI tools can't be used effectively in schools without a steady internet connection, the latest equipment, and enough digital devices for everyone. As study after study shows, it is hardest for schools in rural places and those that don't get enough money. It's even worse now because of the internet gap. People are not all ready at the same level, even in places with lots of technology. The root cause of these issues is budget allocation of the schools cascaded by the division in the rural places leading to the low infrastructure quality that influence how people use technology effectively. To sum up, this shows that infrastructure is not a one-time investment but a need that will always be there. Because of this, infrastructure gaps are not just technical; they are also hurdles to how people can use AI and those who can't.

2. Pedagogy

The place where AI's promise meets the real world is in the way we teach. There is a direct link between teachers' readiness and the effectiveness of AI use in the classroom. Teachers don't have the skills they need to use AI effectively, though, because many schools that train them don't keep up with technological changes. Most of the time, opportunities for professional growth are scattered, short-lived, and unrelated to classroom activities. Plus, AI-based personalized learning and standard testing systems often don't work well together, creating a clash between new ideas and responsibility. For AI to really change the way we teach, teachers need continuous training across different settings and aligned with course goals.

3. Ethics and Culture

It comes down to cultural and moral problems, whether AI is believed and used in schools. Teachers often worry that students will use technology too much, be spied on, or have their information leaked. Concerns about AI systems are exacerbated by their opacity, making it hard for teachers to judge the decisions algorithms make. Cultural differences also pose a problem, as many AI tools are based on Western ideas and don't account for languages and teaching methods that aren't widely used. It's not good for AI to be left out of lessons with a wide range of people. If we want to fix these issues, we need to teach teachers about ethics and create AI systems that can understand different cultures. In addition, awareness of AI governance and other legal and ethical policies to the teachers and students is important for them to know the rights and not to abused the AI tools in line to data privacy, freedom of expression, equality, and non-discrimination.

4. Policy and Governance

The policy and the government set the rules for how AI can be used. But a lot of the time, governing systems are either not there at all or are too new to be useful. Because of this insecurity, people are less likely to spend money and try new things. This puts teachers and schools at risk. Authorship, plagiarism, and questions about the validity of content made by AI are some of the intellectual property problems that make adoption even harder, especially in research and higher education. Also, policies need to be developed for each field, as some,

such as medicine and special education, raise their own legal and ethical issues. Adding AI will remain broken and risky without precise control, which will hurt its long-term survival.

When teachers don't trust the system, they are less likely to follow the rules, slowing the process. People are less likely to spend when they don't know what the policy will do, which keeps widening the gap. When teachers don't trust each other, they can't try new things in the classroom. You can't just work on one of these areas; the whole system needs to be changed because they depend on each other. Equity is the framework's outer lens. It ensures that the principles of fairness and inclusion guide changes across all areas.

The conceptual framework shows that using AI in education is a systemic problem that requires coordinated action by those responsible for infrastructure, teaching, ethics, and leadership. Each area is important, but not enough on its own. AI can only live up to its promise as a force that will change and improve education if all these areas are addressed together. The framework gives policymakers, teachers, and researchers a way to identify barriers and plan solutions that address the whole person.

Conclusion and Recommendations

The study found that Filipino teachers work hard to incorporate AI into K–12 classrooms. There are many reasons they happen, including significant and minor cultural problems, as well as technical ones. When things are poor, schools are tough, and there aren't enough tools that work everywhere, it takes longer to get used to them. Many people are worried that AI will change what we consider essential. And it doesn't fit with the varied ways of living and cultures in the Philippines.

The study says AI should be added incrementally. To create trust, start with low-risk tasks like producing quizzes and helping with office work. Many people should be able to obtain hands-on training in their field tailored to their needs. All teachers should learn about AI ethics before they start and while they work. It should discuss privacy, justice, and how easy it is to learn how computers work. People in communities and schools need to work together to build AI tools that fit with local values and the way schools work. The government needs to obey the rules, and things need to get better. Teachers also need tools to help them address their difficulties and to understand how technology has transformed them.

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Conflict of Interest

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References

- Ahmed, S., Khalil, M. I., Chowdhury, B., Haque, R., Rahman, A., Senathirajah, S., & Din, O. (2022). Motivators and barriers of artificial intelligent (AI) based teaching. *Eurasian Journal of Educational Research*, 100(100), 74-89. <https://doi.org/10.14689/ejer.2022.100.006>
- Al-Qerem, W., Eberhardt, J., Jarab, A., Al Bawab, A. Q., Hammad, A., Alasmari, F., ... & Al-Beool, S. (2023). Exploring knowledge, attitudes, and practices towards artificial intelligence among health professions' students in Jordan. *BMC Medical Informatics and Decision Making*, 23(1), 288. <https://doi.org/10.1186/s12911-023-02403-0>
- Allam, R. M., Abdelfatah, D., Khalil, M. I. M., Elsaieed, M. M., & El Desouky, E. D. (2024). Medical students and house officers' perception, attitude and potential barriers towards artificial intelligence in Egypt, cross sectional survey. *BMC Medical Education*, 24(1), 1244. <https://doi.org/10.1186/s12909-024-06201-8>
- Balsano, C., Burra, P., Duvoux, C., Alisi, A., Piscaglia, F., Gerussi, A., ... & Donatelli, P. (2023). Artificial Intelligence and liver: Opportunities and barriers. *Digestive and Liver Disease*, 55(11), 1455-1461. <https://doi.org/10.1016/j.dld.2023.08.048>
- Barber, J. R. G., Park, S. E., Jensen, K., Marshall, H., McDonald, P., McKinley, R. K., ... & Alberti, H. (2019). Facilitators and barriers to teaching undergraduate medical students in general practice. *Medical education*, 53(8), 778-787. <https://doi.org/10.1111/medu.13882>
- Barrera Castro, G. P., Chiappe, A., Ramírez-Montoya, M. S., & Alcántar Nieblas, C. (2025). Key barriers to personalized learning in times of artificial intelligence: A literature review. *Applied Sciences*, 15(6), 3103. <https://doi.org/10.3390/app15063103>

- Brennan, H. L., & Kirby, S. D. (2022). Barriers of artificial intelligence implementation in the diagnosis of obstructive sleep apnea. *Journal of Otolaryngology-Head & Neck Surgery*, 51(1), 16. <https://doi.org/10.1186/s40463-022-00566-w>
- Bullard, A. J., & Bahar, A. K. (2023). Common barriers in teaching for creativity in K-12 classrooms: A literature review. *Journal of Creativity*, 33(1), 100045. <https://doi.org/10.1016/j.jyoc.2023.100045>
- Cheah, Y. H., Lu, J., & Kim, J. (2025). Integrating generative artificial intelligence in K-12 education: Examining teachers' preparedness, practices, and barriers. *Computers and Education: Artificial Intelligence*, 8, 100363. <https://doi.org/10.1016/j.caeai.2025.100363>
- Cheng, E. C. K., & Wang, T. (2023). Leading digital transformation and eliminating barriers for teachers to incorporate artificial intelligence in basic education in Hong Kong. *Computers and Education: Artificial Intelligence*, 5, 100171. <https://doi.org/10.1016/j.caeai.2023.100171>
- Chiu, T. K., & Chai, C. S. (2020). Sustainable curriculum planning for artificial intelligence education: A self-determination theory perspective. *Sustainability*, 12(14), 5568. <https://doi.org/10.3390/su12145568>
- Elliott, R., & Kim, B. L. (2025). Overcoming barriers: the potential of AI digital textbooks in multicultural middle school education. *Multicultural Education Review*, 17(1), 19-41. <https://doi.org/10.1080/2005615X.2025.2467765>
- Fauville, G., McHugh, P., Domegan, C., Mäkitalo, A., Möller, L. F., Papathanassiou, M., ... & Gotensparre, S. (2018). Using collective intelligence to identify barriers to teaching 12–19 year olds about the ocean in Europe. *Marine Policy*, 91, 85-96. <https://doi.org/10.1016/j.marpol.2018.01.034>
- Fitas, R. (2025). Inclusive Education with AI: Supporting Special Needs and Tackling Language Barriers. *arXiv preprint arXiv:2504.14120*. <https://doi.org/10.48550/arXiv.2504.14120>
- Gago-Galvagno, L., Justo, M. M., Zelaya, M., Hauché, R., Ferrero, P. F., Todarello, F., ... & Touriño, L. (2025). AI in education and cultural barriers: a mixed-methods study with Argentinean university students. *Cogent Education*, 12(1), 2559154. <https://doi.org/10.1080/2331186X.2025.2559154>
- Hanshaw, G., & Sullivan, C. (2025). Exploring barriers to AI course assistant adoption: a mixed-methods study on student non-utilization. *Discover Artificial Intelligence*, 5(1), 178. <https://doi.org/10.1007/s44163-025-00312-x>
- Hirsh, A., & Levental, O. (2025). Barriers and Facilitators to Implementing Artificial Intelligence in Teaching Physical Education. *Journal of Physical Education, Recreation & Dance*, 96(7), 16-25. <https://doi.org/10.1080/07303084.2025.2520207>
- Huang, W., & Yu, W. (2025). Barriers to integrating artificial intelligence education: implications from five early adopters in South Korea. *Computer Science Education*, 1-24. <https://doi.org/10.1080/08993408.2025.2565199>
- Kelly, D. P. (2015). Overcoming barriers to classroom technology integration. *Educational Technology*, 40-43. <https://www.jstor.org/stable/44430356>
- Kokoç, M. (2024). Factors influencing K-12 teachers' experiences of using Generative AI Tools: opportunities and barriers. *Journal of e-Learning and Knowledge Society*, 20(3), 101-111. <https://doi.org/10.20368/1971-8829/1136039>
- Liu, Y., Awang, H., & Mansor, N. S. (2025). Exploring the Potential Barrier Factors of AI Chatbot Usage Among Teacher Trainees: From the Perspective of Innovation Resistance Theory. *Sustainability*, 17(9), 4081. <https://doi.org/10.3390/su17094081>
- Masunungure, A., & Maguvhe, M. O. (2025). Barriers to teaching in culturally and linguistically diverse classrooms in mainstream secondary schools. *Journal for Multicultural Education*, 19(1), 1-13. <https://doi.org/10.1108/JME-12-2023-0134>
- Mavrogenis, A. F., Hernigou, P., & Scarlat, M. M. (2024). Artificial intelligence, natural stupidity or artificial stupidity: who is today the winner in orthopaedics? What is true and what is fraud? What legal barriers exist for scientific writing?. *International Orthopaedics*, 48(3), 617-623. <https://doi.org/10.1007/s00264-024-06102-x>
- Mehdaoui, A. (2024). Unveiling Barriers and Challenges of AI Technology Integration in Education: Assessing Teachers' Perceptions, Readiness and Anticipated Resistance. *Futurity Education*, 4(4), 95-108. <https://doi.org/10.57125/FEED.2024.12.25.06>
- Moore, R., Vernon, T., Gregory, M., & Freeman, E. L. (2023). Facilitators and barriers to physical activity among English adolescents in secondary schools: a mixed method study. *Frontiers in Public Health*, 11, 1235086. <https://doi.org/10.3389/fpubh.2023.1235086>
- Munoriyarwa, A. (2024). Unravelling socio-technological barriers to AI integration: A qualitative study of Southern African newsrooms. *Emerging Media*, 2(3), 474-498. <https://doi.org/10.1177/27523543241288814>
- Naeem, M., Ozuem, W., Howell, K., & Ranfagni, S. (2023). A step-by-step process of thematic analysis to develop a conceptual model in qualitative research. *International journal of qualitative methods*, 22, 16094069231205789. <https://doi.org/10.1177/16094069231205789>
- Pratiwi, H., Riwarda, A., Hasruddin, H., Sujarwo, S., & Syamsudin, A. (2025). Transforming Learning or Creating Dependency? Teachers' Perspectives and Barriers to AI Integration in Education. *Journal of Pedagogical Research*, 9(2), 127-142. <https://doi.org/10.33902/JPR.202531677>
- Qayyum, A., Rafique, Z., Shah, S. S. W. A., Ahmad, S., & Haider, Z. (2025). Artificial intelligence (AI)-driven curriculum development in early childhood education: Educators' insights, barriers, and policy pathways. *Research Journal of Psychology*, 3(1), 713-733. <https://doi.org/10.59075/rjsv3i1.102>

- Renz, A., & Hilbig, R. (2020). Prerequisites for artificial intelligence in further education: Identification of drivers, barriers, and business models of educational technology companies. *International Journal of Educational Technology in Higher Education*, 17(1), 14. <https://doi.org/10.1186/s41239-020-00193-3>
- Soleimani, S., Farrokhnia, M., van Dijk, A., & Noroozi, O. (2025). Educators' perceptions of generative AI: Investigating attitudes, barriers and learning needs in higher education. *Innovations in Education and Teaching International*, 62(5), 1598-1613. <https://doi.org/10.1080/14703297.2025.2530767>
- Starks, A. C., & Reich, S. M. (2023). "What about special ed?": Barriers and enablers for teaching with technology in special education. *Computers & Education*, 193, 104665. <https://doi.org/10.1016/j.compedu.2022.104665>
- Tang, S. M. (2025). Barriers to artificial intelligence adoption in teaching: the moderating role of personal innovativeness. *International Journal of Educational Management*, 1-12. <https://doi.org/10.1108/IJEM-07-2024-0381>
- Vazhayil, A., Shetty, R., Bhavani, R. R., & Akshay, N. (2019, December). Focusing on teacher education to introduce AI in schools: Perspectives and illustrative findings. In *2019 IEEE tenth international conference on Technology for Education (T4E)* (pp. 71-77). IEEE. <https://doi.org/10.1109/T4E.2019.00021>
- Velander, J., Taiye, M. A., Otero, N., & Milrad, M. (2024). Artificial Intelligence in K-12 Education: eliciting and reflecting on Swedish teachers' understanding of AI and its implications for teaching & learning. *Education and Information Technologies*, 29(4), 4085-4105. <https://doi.org/10.1007/s10639-023-11990-4>
- Wang, T., & Cheng, E. C. K. (2021). An investigation of barriers to Hong Kong K-12 schools incorporating Artificial Intelligence in education. *Computers and Education: Artificial Intelligence*, 2, 100031. <https://doi.org/10.1016/j.caeai.2021.100031>
- Williams, R., Ali, S., Devasia, N., DiPaola, D., Hong, J., Kaputsos, S. P., ... & Breazeal, C. (2023). AI+ ethics curricula for middle school youth: Lessons learned from three project-based curricula. *International Journal of Artificial Intelligence in Education*, 33(2), 325-383. <https://doi.org/10.1007/s40593-022-00298-y>
- Woodruff, K., Hutson, J., & Arnone, K. (2023). Perceptions and barriers to adopting artificial intelligence in K-12 education: A survey of educators in fifty states. <https://doi.org/10.5772/intechopen.1002741>
- Yim, I. H. Y. (2024). Artificial intelligence literacy in primary education: An arts-based approach to overcoming age and gender barriers. *Computers and Education: Artificial Intelligence*, 7, 100321. <https://doi.org/10.1016/j.caeai.2024.100321>
- Zadorozhnyy, A., Winsy, L. W. Y., & Lee, J. S. (2025). EFL Teachers' Ecological Barriers to Integrating Informal Digital Learning of English. *TESOL Quarterly*. <https://doi.org/10.1002/tesq.3400>