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The Role of Artificial Intelligence in Enhancing Teachers' Productivity and Classroom Management

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Abstract

The study examines the role of Artificial Intelligence (AI) in enhancing teachers' productivity and classroom management. For this purpose, a "Systematic Literature Review" of twenty-five (25) research papers was selected to analyse the phenomena. To analyse the data, three major themes were developed: a) AI and Teachers' productivity, b) AI and classroom management, and c) barriers and challenges teachers face when using AI tools and systems. To give the theoretical foundation, the Technology Acceptance Model (TAM), the Technological Pedagogical Content Knowledge (TPACK), and the Resource-Based View (RBV) were applied. The findings showed that AI enhances overall Teachers' productivity through advancements in administrative tasks, facilitation of lesson planning and design, content creation, and performance and workload evaluation, ultimately saving time. Moreover, the adoption of AI can enhance classroom management through automation, monitoring and assessment, behavioral tracking, and greater efficiency in the teaching and learning process. However, integration of AI in classroom settings remains challenging for teachers due to insufficient infrastructure, teachers' resistance, a lack of technical training and skills, data privacy and security issues, ethical considerations, and inadequate institutional support. It can be recommended that implementing various types of training and awareness programs for teachers to enhance their competencies in using AI tools and systems in classroom settings.

1. INTRODUCTION

The state of intelligence has been the core characteristic of human beings since ancient times (Ferraris, 2024; Hunt, 2010). Over time, scientists and researchers have critically studied human intelligence, brain processes, and their application to machine learning. The invention of modern technologies and machine learning has transferred human intelligence processes to machine-based learning and teaching, but it cannot replace human intelligence due to the unique features of the human brain and cognitive process (Xu et al., 2021; Korteling et al., 2021). AI is a branch of Computer Science (CS) and one of the most important elements in the current technological era. The term "AI" is a combination of two separate words, "artificial" and "intelligence," where intelligence means the overall ability to comprehend new and changing conditions, or any situation, encompassing terms such as perception, empathy, views, and the learning process. On the other hand, the term "artificial" is derived from the words "make" or "create," which apply to anything resulting from an activity or action that creates

and forms things, as opposed to things that exist certainly without human intervention (Mints & Brodie, 2019; Xu et al., 2021; Zouhaier, 2023).

In recent years, the world has witnessed faster development and greater application of AI systems in education and business sectors (Brandao, 2025; Rai, 2024). The overall effect of the application has been evident across scientific fields and, more specifically, in educational institutions and academic domains (Farooqi, Siddique & Awan, 2024). Consequently, AI in academic institutions is reshaping how teachers prepare lessons, manage classroom activities, assess students' performance, and engage learners in research on new developments (Maamor et al., 2024). Moreover, AI has reduced the workload of teachers, supporting instructional plans, managing classroom discipline, promoting teachers' competencies, enhancing students' engagement, and supporting the overall monitoring of instructional activities and administrative tasks/ work (Mounkoro et al., 2024; PlanIt, 2025; Sun, Yu & Xu, 2023; Tanvir, Bashir & Shahzadi, 2024). Furthermore, many other studies, such as Tan, Cheng & Ling (2025), Xu (2024), Nemani (2025), have claimed that AI serves an essential role in providing a foundation for strengthening the teacher's role at schools, improving learners' assessment of the overall academic performance, and enhancing the efficiency and effectiveness of teaching and learning processes. Due to such efficiencies, AI tools and systems have been employed for administrative tasks, such as grading students' test scores, providing informed feedback, analysing large-scale datasets, and identifying new patterns to develop educational strategies and policies at schools (Tanvir, Bashir & Shahzadi, 2024; Zhai, 2024; Zhai et al., 2021).

Similarly, many studies such as (Alwakid, Dahri, Humayun & Alwakid, 2025; Ayanwale et al., 2022; Gupta & Nitu Kumar, 2024; Ishaq, Bangulzai, Asif & Ullah, 2025) have argued that AI has enhanced the teacher's productivity as the system has assumed administrative tasks, instructional functions, teachers have presented new learning and teaching opportunities to improve the quality of education/ instruction, and fostered individualised learning experiences. Furthermore, AI tools and systems are adaptive learning platforms, automate the assessment process, and intelligent tutoring technologies that ease the routine loads while providing data-driven understandings into the students' performance (Ishaq, Bangulzai, Asif & Ullah, 2025; Barbu & Sbughea, 2024). Therefore, teachers can redirect their overall cognitive and creative resources towards higher-level pedagogical tasks such as curriculum innovation and personalised mentoring of students' progress. Additionally, Fitria (2021), Belloula (2025), and Vieriu & Petrea (2025) have agreed that AI tools save teachers precious time, such as automatic grading systems, intelligent scheduling software, and adaptive learning platforms, which have demonstrated their potential to streamline these processes, enabling teachers to manage their time more effectively in the classroom. On the other hand, AI tools increase teachers' overall self-efficacy and integration into teaching and learning processes. Therefore, pedagogical efficiency can enhance the students' interest in the learning process. Hence, AI can sustainably broaden teachers' efficiency without diminishing their necessary humanistic and relational roles in the learning and teaching processes (Patterns, 2024; Alam, 2021; Bhuvaneshwara et al., 2025; Zhai, 2024).

The majority of studies, such as (Vieriu & Petrea, 2025; Gupta & Nitu Kumar, 2024; Nemani, 2025), have shown that AI supports classroom management, where it has promoted the inclusive learning process, enhanced digital literacy among teachers and students, and improved relationships between teachers and students. Similarly, studies, such as Mounkoro et al. (2024); Chakravarty, Satpath Jain, Patnaik & Poddar (2024); Tan, Cheng & Ling (2025), have agreed that AI-ordered classroom management, the delegation of administrative responsibilities, and the customisation of learning needs can ease teachers' lives and workload. Additionally, AI offers a promising approach to saving the time of teachers and enhancing competency and productivity in education. One of the most important AI roles is providing quick feedback to the students' performance (Patterns, 2024; Niculescu et al., 2025; PlanIt, 2025; Zhai, 2024). AI is mainly based on data analytics and algorithms that help manage the classroom, identify students' behaviour and academic performance, and provide helpful

feedback on how best to approach a class. Few studies, such as those by Ahmed (2024) and Leek, Rojek, Dobińska & Kosiorek (2024); Yugandhar & Rao (2024); Niculescu et al. (2025); PlanIt, (2025), have also argued that meaningful education and learning depend on effective classroom management and expanded the scope of learning, leading to a greater likelihood of deeper student learning processing, more effective and efficient use of time, and more positive emotions during the learning and teaching process.

Therefore, the present study examines the role of AI and its implications on classroom management and teachers' productivity. The research is divided into three major themes: AI and teachers' productivity; AI and classroom management; and the barriers teachers face when using AI-related tools and systems. AI has supported advancements in administrative tasks, making lesson planning easier, automating grading, facilitating content creation, feedback & communication, reducing workload, and engaging students. Also, the AI is helpful for behavioural tracking and for improving teaching and learning efficiency. However, despite these facilitations and the positive aspects of AI in classroom settings, the adoption of AI remains a major challenge for teachers and administrators. The challenges included the insufficient infrastructure, teachers' resistance and negative attitudes towards AI adaptation due to fear of job replacement, and a lack of technical training and skills among teachers, especially those less familiar with AI and ICTs. Other challenges are issues in the overall data privacy, security threats, and ethical concerns, as well as insufficient institutional or administrative support.

Research Objectives

The research examines the following research objectives:

- To examine how the usage of AI tools/systems enhances teachers' productivity, such as automating or streamlining time-consuming tasks.
- To study the usage of AI tools/systems and improvement in classroom management, such as supporting personalised learning, real-time monitoring, predictive analytics, and feedback loops.
- To investigate barriers and challenges faced by teachers while using AI tools and systems in educational institutions.

2. THEORETICAL FRAMEWORK

To examine the phenomena and give the foundation to the research work, three major theories have been applied to the relationship between AI and teachers' productivity and classroom management: the first theory is the Technology Acceptance Model (TAM), the second theory is the Technological Pedagogical Content Knowledge (TPACK), and the third is the Resource-Based View (RBV). Therefore, the TAM suggested that the adoption of AI in educational settings depends on teachers' perceived benefits and usefulness in enhancing students' learning capabilities at the school level. Teachers are normally adopting different AI tools to reduce workload and enhance teaching effectiveness. Also, enhancing teachers' efficiency means saving time, reducing their overall workload at schools, and increasing their overall involvement in academic activities, ultimately increasing students' engagement at the classroom level. Similarly, with respect to TPACK, teachers adopt AI tools and systems based on their competencies and perceived usefulness, as the major role is for teachers and their capabilities in the usage of AI tools and systems. Similarly, using the TPACK framework, teachers in educational settings integrate different AI tools and systems into their subject content and pedagogy, making them more viable and automating educational and administrative tasks. Through this, teachers can personalise their learning level while using AI tools. Learning improvement is related to classroom improvement, proper time management, and enhanced teachers' productivity, while maintaining effectiveness in the overall instructional practices.

Additionally, the RBV argued that AI can optimise the use of time, educational resources, and teachers' abilities, allowing teachers to focus on high-level tasks such as research and student engagement. The AI tools and systems can serve as a strategic learning resource that strengthens teachers' capabilities, integrating the learning system. This can also improve teachers' productivity and informed decision-making regarding the policies related to students' engagement. All these have a strong association with classroom management by enhancing modern instructional and educational competencies and optimising school-level performance among students.

3. RESEARCH METHODOLOGY

For the present research, the Systematic Literature Review (SLR) approach was adopted, focusing on peer-reviewed journals, conference papers, and reports published between 2020 and 2025 on the use of AI and teachers' productivity and classroom management. For data searching, Google Scholar, Scopus, and ERIC were explored using keywords such as "AI and Teachers' Productivity", "AI and Classroom Management", "AI and Education", and "AI as a Teaching Tool". In this regard, almost fifty (50) research papers were collected; only twenty-five (25) were the most relevant, and some of them are in the international domain, mainly focusing on AI, teachers' productivity, and classroom management. After reviewing 25 articles, no new information was received; therefore, the sample size of the papers was restricted to 25 international publications. Furthermore, research papers that focused solely on students' learning outcomes, without teacher-related outcomes, were excluded from the study. The results/ data were analysed thematically to identify recurring patterns and insights related to the research objectives. The thematic analysis method was applied as a data analysis technique, yielding three major themes. The first theme concerns AI and teachers' productivity; the second, AI and classroom management; and the third, the barriers and challenges teachers face when using or adopting AI tools and techniques. All the research papers or books have been properly cited in text and also include the complete reference at the end of the research.

4. RESULTS AND DISCUSSIONS

The results and discussion section is further divided into central themes, including AI and teachers' productivity, classroom management, and the barriers teachers face when adopting AI tools and systems in educational institutions. The first theme examines the AI tools and systems and their implications on the teachers' productivity at educational institutions. From the review of articles, many sub-themes have been identified, such as advancement of administrative tasks, lesson planning and designing, automating grading, students' performance and feedback, as well as saving time via reducing workload.

Table No. 1: AI & Teachers' Productivity

Sub-Themes	Arguments/ Quotes
Advancement in Administrative & Routine Tasks	The majority of the studies have agreed that AI has saved time in the grading process due to automatic grading. Estimates showed that per week, it can save almost 10-15 hours. Many tools have been designed for lesson planning, and it has become streamlined, unique content creation by personalising learning materials (Mounkoro et al., 2025; Lee, 2025; Ishaq, Bangulzai, Asif & Ullah, 2025; Melweth, Alkahtani & Al Mdawi, 2024; Rocconi, 2025). Moreover, the generative AI systems
Lesson Planning, Designing and Grading	
Content Creation	

Students' performance & progress Feedback & Communication Workload reduction & Time saving.	empower teachers to create diverse, adaptive, and engaging educational content, supporting the overall creativity and curriculum alignment process (Tanvir, Bashir & Shahzadi, 2024; Zhai, 2024; Zhai et al., 2021; Ishaq, Bangulzai, Asif & Ullah, 2025; Barbu & Sbughea, 2024). Additionally, the efficient tracking system of students' progress and behaviour reduced the time spent on school administrative tasks. AI promotes automatic attendance tracking, which saves time and teachers' energy (Dimitriadou & Lanitis, 2023; Mounkoro et al., 2025; Melweth, Alkahtani & Al Mdawi, 2024; Ahmad et al., 2022). It can also minimise the overall workload; therefore, teachers can focus more on student collaboration and content development. AI has assisted in the lesson planning process, designing unique instructional materials and content, enhancing lesson quality, and reducing manual effort (Sun, Yu & Xu, 2023; Tanvir, Bashir & Shahzadi, 2024; Mounkoro et al., 2025; Zhai, 2024; Ishaq, Bangulzai, Asif & Ullah, 2025). AI analytics improve accurate tracking and estimation as well as prediction of students' academic performance, empowering personalised interventions and data-driven teaching in the classroom, which is also called research-based instruction (Sun, Yu & Xu, 2023; Yugandhar & Rao, 2024; Ukozor, 2025; Niculescu et al., 2025; Zhou & Peng, 2025). The majority of studies have argued that AI can strengthen the two-way communication process between students and teachers through a smart and intelligent feedback system (Patterns, 2024; Alam, 2021; Bhuvaneshwara et al., 2025; PlanIt, 2025).

To examine AI & teachers' productivity, a few sub-themes have been designed, where the most important sub-themes that the majority of the studies have talked about are the advancements in administrative duties, unique content creation, an easy overall planning process, a tracking system, an automatic tracking system for attendance, and forecasting the students' progress. All these have an association with time saving and accurate feedback. Teachers generally share the progress of students through online sources daily, which updates parents. Research has calculated that automating administrative duties and routine responsibilities, such as an automatic grading system, attendance tracking process, and progress monitoring, has saved almost 10–15 hours per week. It also supports the lesson planning process, reducing teachers' workload so they can focus primarily on the academic side.

AI has also enhanced academic accuracy and guided interventions. Almost all the above studies have found that AI has strengthened the two-way communication between teachers and students. Previously, Parents and teachers' meetings were conducted every month; however, AI has solved these issues, and now the progress is shared daily with parents or guardians. On the other hand, the effective usage of AI depends on the teacher's capabilities and the reliability of the AI tools. All the studies have further proposed that generally, teachers lack IT-related competencies and skills; therefore, they need to be trained in the field of AI. School administration is required to arrange different capacity-building workshops for teachers to promote their AI and IT skills. This can promote the integration into pedagogical practice and skills of teaching and learning via the usage of AI tools and systems.

Table No. 2: AI & Classroom Management

Sub-Themes	**Arguments/ Quotes**
Personalising the Students'	The majority of studies have found that AI has a relationship with cognitive, managerial, motivational-psychological, and evaluation

Learning and Satisfaction Classroom engagement of students Automation and Communication Real-time monitoring and evaluation Behavioral Tracking Efficiency in teaching and learning	processes directly. AI is a learner-centred/ based education tool and promotes a personalised learning system, mainly focused on the pedagogical strategy. On the other hand, the overall students' academic performance can be improved through an integrated approach through integration of algorithms and modifications to timing and complexity, to overcome high-level challenges (Mounkoro et al., 2025; Ukozor, 2025; Ishaq, Bangulzai, Asif & Ullah, 2025; Melweth, Alkahtani & Al Mdawi, 2024). The majority of the studies have further talked about the teachers' view, where the majority of teachers were delighted to be adopting AI tools; they feel more productive and vested in their roles. AI empowers teachers' roles, allowing teachers to invest more time in students' success. Many studies have been conducted on the views of teachers as the majority of the teachers have agreed that AI has enhanced work-life balance by facilitation and easing the burden of administrative tasks, thereby increasing job satisfaction and perceived productivity (Dimitriadou & Lanitis, 2023; Sun, Yu & Xu, 2023; Yugandhar & Rao, 2024; Zhou & Peng, 2025; Ishaq, Bangulzai, Asif & Ullah, 2025). The classroom management is directly associated with controlling the students' behaviour by inspiring them and making the learning process active and fun. More learning due to reducing the burden from the routine activities such as roll calling, assessments, and individual work assessments, has saved precious time for teachers. Once AI elements were built into the app, students' practices changed, so the time spent grading and creating lesson plans went down significantly and was redirected to direct student work. AI provides up-to-date information about the students' requirements, as well as academic activities that enhance students' classroom participation. Enhance teachers' deep learning and engaged students (Yugandhar & Rao, 2024; Delello et al., 2025; Zhou & Peng, 2025; PlanIt, 2025). AI-assisted data analytics that provided insights into student performance, allowing more targeted interventions and streamlined teaching methods (Yugandhar & Rao, 2024; Niculescu et al., 2025; PlanIt, 2025). AI tools are practical in facial recognition for attendance tracking, sentiment analysis to instrument student engagement, and adaptive arrangement and scheduling systems, which can enhance teachers' ability to maintain organised, efficient, and approachable and responsive classrooms (Mounkoro et al., 2025; Bhuvaneshwara et al., 2025; Melweth, Alkahtani & Al Mdawi, 2024; Ahmad et al., 2022). AI tools and algorithms in classrooms have improved student participation, improved classroom management, and increased the quality of the teacher decision-making process through proper monitoring and evaluation of their performance (Patterns, 2024; Niculescu et al., 2025; PlanIt, 2025; Zhai, 2024).

To critically examine AI and classroom management, a few sub-themes have been developed, where the most important sub-themes were personalising students' learning, student engagement, communication, real-time monitoring, behavioural tracking, and efficiency in the teaching and learning process. The results showed that AI has overall strengthened classroom

management by permitting adapted learning strategies, data-based monitoring and evaluation of students' academic and non-academic performance, and efficient behavioural tracking. Moreover, advancements in tasks such as student attendance, academic assessment, and reducing teachers' cognitive load are being made. This can allow more time for direct student support and improve their efficiency in their area of interest. Most studies have further argued that teachers are pleased with improving their work–life balance and promoting adaptive and flexible academic activities. On the other hand, a few studies have also raised concerns that total dependence on algorithms may risk over-standardisation of data privacy and security. Therefore, teachers are required to have digital competence and skills to safely use the AI tools and techniques in their educational activities at institutions. The majority of the studies have identified that there is a risk of data privacy, depending on the algorithm, which can provide substandard data or content. The human mind is unique, and AI can provide data that is fed by humans; therefore, the majority of the studies have agreed that AI cannot replace the human mind due to its unique features.

Table No. 3: Barriers faced in using AI tools and systems

Sub-Themes	Arguments/ Quotes
Insufficient infrastructure facilities Teachers' resistance Lack of technical training & skills Data privacy, security and ethical concerns insufficient institutional support	The majority of studies have shown that there is less investment in AI in educational institutions due to limited financial resources/ access and inadequate technical support. The teachers' behaviour is also important in this regard (Dimitriadou & Lanitis, 2023; Sun, Yu & Xu, 2023; Ukozor, 2025; Zhai et al., 2021; Melweth, Alkahtani & Al Mdawi, 2024). The majority of the studies have agreed that teachers naturally resist due to a sceptical nature, lack of institutional trust, fear of job replacement by teachers, and reluctance to change their existing/ traditional teaching practices (Filiz, Kaya & Adiguzel, 2025; Zulkarnain & Yunus, 2023; Cojean, Brun, Amadieu & Dessus, 2023; Zhai, 2024; Delello et al., 2025). Another major concern is the inadequate AI literacy and training programs, and limited digital competencies among traditional teachers, which constrain the effective application of AI-based teaching practices (Rocconi, 2025; Zeng, Cheah & Abdullah, 2025; Tanvir, Bashir & Shahzadi, 2024; Dimitriadou & Lanitis, 2023; Zhou & Peng, 2025). Globally, statistics show that only 24% of teachers have received AI-related training and skills. On the other hand, the majority of 70% of studies have shown that teachers express concerns about inadequate technical skills; therefore, most of the studies have recommended conducting professional training for the teachers to enhance their AI literacy and skills. Similarly, data privacy is a significant and concerning issue, raising concerns about data, algorithmic bias, and student independence (Dimitriadou & Lanitis, 2023; Cojean, Brun, Amadieu & Dessus, 2023; Lee, 2025; Niculescu et al., 2025; Barbu & Sbughea, 2024). The institutions fail to provide policy terms, infrastructure, and guidelines (Zeng, Cheah & Abdullah, 2025; Mounkoro et al., 2025; Zhai, 2024; PlanIt, 2025; Melweth, Alkahtani & Al Mdawi, 2024).

The majority of the studies have identified the most important barriers and challenges while adopting the AI tools and systems in classroom management and teachers' productivity. The important barriers were insufficient infrastructure, teachers' resistance due to their fear of job replacement, lack of technical training and skills among the teachers, lack of sufficient funds to fully operationalise the process, data privacy and management issues, ethical concerns, and inadequate institutional and administrative support. The results showed that different barriers limit teachers' effective use of AI in classrooms and their productivity, whereas the

lack of sufficient infrastructure, technical support, and resources hinders the reliable adoption of AI in classroom settings. Moreover, there is resistance among teachers, including fear of job displacement and attachment to traditional teaching and learning practices. Additionally, traditional teachers lack AI competencies and receive inadequate training in AI and its application in classroom settings. Also, a few other barriers have been identified by studies as privacy issues of data, algorithmic bias and the problem of sub-standard data/ contents, and ethical risks, further reducing trust among the teachers. Apart from the above barriers and challenges, the major issue is the lack of institutional support, including unclear institutional policies, limited funding facilities to conduct training and fully operationalise the AI tools/ system, and the absence of implementation guidelines. All these create uncertainty among the teachers, collectively constraining AI's potential to enhance teaching and learning.

5. CONCLUSION

The integration and operationalisation of AI in classroom settings enhances the teachers' productivity and classroom management. The primary role of teachers is to promote educational activities, but due to the burden of administrative and non-academic tasks, teachers' efficiency decreases, and most of the time, teachers engage with routine activities rather than focus on academic content. Now, AI has replaced manual work performed by teachers. Teachers, therefore, have mainly focused on academic work. However, many educational institutions have not yet implemented AI due to a lack of teachers' competencies, insufficient ICT skills, teachers' resistance, and fear of being replaced. Despite all these challenges, students and teachers have now adopted AI tools and systems, which have enhanced communication, integrated learning systems, and automated records and assessments in classroom settings. The full operationalization of the AI tools and system required the IT competencies, positive attitude of teachers, institutional support, allocation of funds, and conducting professional training programs for teachers to enhance their IT and AI skills. With working in human capital, it is almost impossible to incorporate AI in the academic domain. Teachers are the primary stakeholders; therefore, the positive attitude and behavioral change can only enable the adoption of the AI systems and tools in educational institutions.

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