Teachers Perceptions & Attitudes towards Artificial Intelligence (AI) Integration in Suburban School

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Abstract

In the digital transformation era, educators are exploring the potential of artificial intelligence (AI) to enhance learning. This study investigates teachers' perceptions and attitudes regarding artificial intelligence (AI) integration in suburban schools. A quantitative survey methodology was employed, using a structured questionnaire distributed via Google Forms to suburban school teachers. The questionnaire consisted of four sections: demographic information, perceived usefulness, perceived ease of use, and attitudes toward AI. Responses were measured using a five-point Likert scale to assess teachers' agreement levels with various AI-related statements. A total of 250 questionnaires were distributed between February 1 and May 30, 2024, yielding 205 valid responses (82% response rate). The study found that in terms of perception, suburban teachers generally view artificial intelligence (AI) as a valuable tool in their work. They believe artificial intelligence (AI) can help them personalize learning for students, address individual needs, improve their teaching skills, and reduce the time spent on administrative tasks. In the context of attitudes, teachers are particularly excited about how artificial intelligence (AI) can enhance creativity and problem-solving in the classroom and improve their overall teaching effectiveness. Their attitudes suggest enthusiasm for AI's potential to foster creativity and problem-solving in classrooms. These positive perceptions and attitudes highlight a readiness among teachers to integrate AI into their teaching practices.

Keywords: artificial intelligence, teachers, suburban school, technology acceptance, online education

1. Introduction

1.1 Introduce the Problem

The digital landscape of education is rapidly evolving, with educators exploring innovative technologies like artificial intelligence (AI) to enhance student learning. In the whirlwind of the digital revolution, the education sector is experiencing a metamorphosis. Fueled by advancements in communication and educational technologies, classrooms are no longer confined to traditional textbooks and blackboards. Artificial intelligence (AI) stands at the forefront of this transformation, emerging as a potential force to revolutionize how we learn and teach. The use of digital technology in the classroom is a significant issue for teachers as they are under increasing pressure to teach in technologically mediated ways (Buchanan, 2011).

Dilmurod and Fazliddin (2021) explained AI can act as a valuable supplementary tool, enriching the learning experience, streamlining educational processes, and fostering improved communication within the educational ecosystem. Railean (2017) also suggested that the digital revolution changes education systems, requiring new interface designs for digital textbooks due to screen size, diversity, and availability.

In the face of a growing digital landscape, higher education is at the cliff of a monumental shift. The proliferation of digital learning platforms and the rise of online-centric institutions are propelling a comprehensive transformation. Alenezi (2023) states this digital revolution extends far beyond the realm of pedagogy, reshaping the methods of teaching and learning and the very foundation of how universities operate. From streamlined administrative processes to a fundamentally altered student experience, the impact of digital technologies is undeniable. Grab et al. (2019) presented digital transformation as a disruptive force that radically alters whole sectors of the economy and institutions.

Further bolstering the case for digital transformation, Gama (2018) posits that this shift aligns perfectly with the evolving business models of higher education institutions driven by technological advancements. This transformation encompasses technological tools, a holistic ecosystem of individuals, collaborative groups, strategic frameworks, and a dynamic competitive landscape (Kopp et al., 2019). As highlighted by Popal et al. (2024), the relentless march of technological advancement has pressured nations to integrate these solutions within their educational sectors. This phenomenon is exemplified by South Asian countries like Malaysia, Indonesia, and Thailand, which have witnessed a surge in adopting technological tools and resources within the classroom.

This technology integration in education reflects a broader trend – a strategic shift towards leveraging the power of digital resources to enhance teaching and learning processes (Sanjaya et al., 2023). The ultimate goal of this shift is multifaceted: to improve educational outcomes for students, equip them with the skills necessary to navigate the complexities of the digital age, and prepare them to be successful contributors to a technology-driven society. The ongoing digital transformation of higher education presents a compelling opportunity to cultivate sustainable curriculums, foster enhanced innovation, and ultimately improve student performance (Shenkoya & Kim, 2023). This evolving landscape is further bolstered by the promise of future advancements, such as the "Education 4.0" framework and the integration of artificial and augmented intelligence (AI/Augmented Intelligence).

The current landscape of higher education is seeing a notable rise in the use of digital educational technologies. Supporters of this shift believe it creates a valuable opportunity to boost institutional competitiveness and improve students' education quality. However, this transformation comes with its own set of challenges. Alenezi et al. (2023) also discuss that integrating digital education in higher education can enhance competitiveness and provide high-quality education but faces challenges and technological resources. While digital resources can be incredibly beneficial, making the most of them requires thoughtful attention to various obstacles that institutions must navigate. However, the successful integration of AI hinges on a critical factor – the perceptions and attitudes of educators themselves. Teachers play an important role in shaping the learning environment and fostering student engagement. Their willingness to embrace and leverage AI effectively will determine the extent to which this technology can truly transform education.

This study delves into suburban school teachers' perceptions and attitudes toward AI integration in their classrooms. It aims to identify how teachers view AI's potential benefits and drawbacks in education and assess their willingness to utilize it. By exploring these aspects, the research seeks to contribute to a more informed approach to integrating AI into education, ultimately ensuring the continued quality of education in the digital age.

Therefore, this research seeks to address this gap by investigating teachers' perceptions and attitudes towards AI integration in suburban areas. The research objectives are divided into two.

1.2 Research Objectives

     1) To describe teachers' perceptions of AI integration in suburban schools.

     2) To identify teachers' attitudes towards integrating AI in suburban schools.

1.3 Research Questions

     1) How do teachers perceive AI integration in suburban schools?

     2) What are the teachers' attitudes towards AI integration in suburban schools?

2. Literature Review

2.1 Education in Suburban Areas

Suburban areas are lower-density areas that separate residential and commercial areas from one another. A suburban area is also known as a cluster of residential properties that are not densely compact yet located very near an urban area. According to Wood (2023), suburban areas are sparsely populated, characterized by natural landscapes,

agriculture, and low population density. The difference between urban and suburban areas also significantly impacts technology, especially artificial intelligence (AI). The difference between urban and suburban areas also significantly impacts the technology used, especially artificial intelligence (AI) (Wood, 2023).

Often seen as the middle ground between bustling cities and tranquil rural landscapes, suburban areas present a unique educational environment. They offer a blend of urban amenities and a quieter, community-oriented lifestyle. However, the educational experiences within these areas can vary significantly.

This difference is especially evident in the education sector, where suburban schools may need more access to the latest technological advancements than the urban community. Integrating AI and other technologies into the teaching and learning processes can be more challenging in suburban educational settings. As a result, the Challenges of integrating AI in educational settings include determining its impact on teaching and learning, addressing potential risks, and establishing equitable, quality education for all (Akinwelere & Ivanov, 2022).

Suburban schools can also face challenges. For instance, increasing socioeconomic disparities within suburbs can lead to educational inequalities. Students from low-income families may encounter barriers to academic success, such as limited access to after-school programs, tutoring, and college counselling (Lee & Bowen, 2006). Moreover, while suburban schools generally have lower rates of crime and violence compared to urban areas, they may still grapple with issues like bullying, substance abuse, and mental health concerns.

Ensuring educators in suburban schools possess the necessary skills and knowledge to effectively leverage AI and other technologies is crucial for providing students with equal opportunities to benefit from the enhanced learning experiences that technological integration offers. This all-inclusive approach to technology-enabled education in suburban areas can ultimately contribute to more equitable and effective educational outcomes for all students. Diamond et al. (2020) suggest that research in suburban with focusing on educational spaces offers valuable insights into race, place, and inequality, offering valuable research opportunities for education researchers across various disciplines.

Integrating Artificial Intelligence (AI) in suburban schools has been an area of growing interest and empirical exploration. Looking at the current literature, research on teachers' perspectives on the topic of artificial intelligence is quite rare (Lindner & Romeike, 2019). It is important to highlight the role teachers' perceptions and preparedness play in effectively leveraging AI-powered technologies to enhance the educational experiences of students in suburban communities, where access to technological resources can often be uneven compared to urban areas (Wood, 2023).

Du et al. (2024), found that most educators, including teachers, lack a clear understanding of how AI functions and struggle to fully integrate it into their teaching practices. Their study, *Exploring the Effects of AI Literacy in Teacher Learning: An Empirical Study*, highlights an urgent need to explore teachers' willingness to learn about AI and the key factors influencing their AI adoption. Recent studies have highlighted the gap between the potential of Artificial Intelligence (AI) in education and teachers' actual understanding and utilization of these technologies in the classroom (Hwang et al., 2020; Celik et al., 2022; Chounta et al., 2021; Chiu & Chai, 2020). Many teachers simply do not have the necessary training or resources to effectively leverage AI-powered tools, limiting their ability to integrate these technologies into their teaching. This challenge is even more pronounced in suburban schools, where limited access to technology and fewer professional development opportunities creates additional barriers to AI adoption (Wood, 2023). Addressing this issue requires targeted support, ensuring that educators are equipped with the knowledge and confidence to use AI effectively in the classroom.

This challenge is particularly relevant in suburban schools, where the disparities in access to technological resources and professional development opportunities may exacerbate the challenges of effectively implementing AI-driven innovations (Wood, 2023). The successful integration of Artificial Intelligence in Education (AIEd) requires not only the availability of the technology itself but also the knowledge and skills of educators to utilize these advancements. In suburban areas, where such resources and support may be limited, the effective deployment of AIEd solutions becomes an even more pressing concern, highlighting the need for targeted professional development and equitable access to technological tools and resources. Addressing these contextual factors is crucial for ensuring that the potential of AIEd is realized across diverse educational settings, including suburban schools, and that all students can benefit from the enhanced learning experiences enabled by these technological advancements.

2.2 Artificial Intelligence in Education (AIEd)

In today's digital era, artificial intelligence (AI) played a transformative role in education, reshaping traditional teaching methods, enhancing learning experiences, and fostering innovation in the classroom. AI is no longer just a

futuristic concept and it is actively changing how educators teach and how students learn. Zawacki-Richter et al. (2019) describe Artificial Intelligence in Education (AIEd) as an emerging field in educational technology. Artificial Intelligence in Education (AIEd) represents a rising ground within educational technology, characterized by integrating artificial intelligence technologies to enhance and revolutionize learning and teaching processes.

According to Baker and Smith (2019), Artificial Intelligence in Education (AIEd) can be analyzed from three different perspectives, which are a) learner-centric, b) educator-centric, and c) system-oriented AIEd perspectives. In a particular aspect, 'AIEd' can significantly automate processes and monitor the advancement of learners across various skills, pinpointing optimal areas where human-teacher intervention may be most beneficial (Chaudhry & Kazim, 2021). This innovative domain leverages AI algorithms, machine learning techniques, and data analytics to personalize educational experiences, optimize learning outcomes, and provide tailored support to students and educators.

AIEd aims to create adaptive learning environments, intelligent tutoring systems, and educational tools that cater to individual students' needs, promote interactive and engaging learning experiences, and streamline administrative tasks in educational institutions. Its evolution signifies a paradigm shift in education, fostering a data-driven, student-centric approach that harnesses the power of AI to transform traditional educational practices and drive continuous improvement in the learning ecosystem.

The evolution of Artificial Intelligence in Education (AIEd) signifies a profound paradigm shift within the realm of education, ushering in a new era characterized by a data-driven and student-centric approach. Popenici and Kerr (2017) explain that artificial intelligence in higher education transforms teaching and learning, but institutions face challenges in adapting to these technologies and ensuring student learning and support. This transformative shift harnesses the immense potential of AI technologies to redefine traditional educational practices and revolutionize the learning landscape. AI in education has significantly improved administration, instruction, and learning by enhancing efficiency, fostering student retention, and enhancing curriculum personalization (Chen et al., 2020). By integrating AI into educational settings, institutions can tap into the power of advanced algorithms and machine learning to analyze vast amounts of data, gaining valuable insights into student performance, preferences, and learning patterns.

AIEd enables the customization and personalization of learning experiences, allowing educators to tailor instruction to individual student needs and provide targeted support where necessary. Through the implementation of AI-driven tools and platforms, educational stakeholders can create adaptive learning environments that cater to diverse learning styles and abilities, fostering greater engagement and improving learning outcomes. Du Boulay (2016) suggests that AIED systems can effectively enhance blended learning by offloading some work to teachers, improving learning outcomes and reducing teacher workload. Kengam (2020) added that, with the advent of artificial intelligence, there has been a notable shift in the education landscape, impacting the traditional roles of teachers. While teachers remain indispensable in the education system for their unique abilities to inspire, mentor, and guide students, integrating AI introduces new dynamics and challenges to their roles.

Moreover, using AI in education paves the way for continuous improvement and innovation within the learning ecosystem. By leveraging AI technologies to automate administrative tasks, streamline processes, and enhance decision-making, educational institutions can optimize resource allocation, enhance efficiency, and drive overall excellence in teaching and learning practices (Khazin et al., 2023). UNESCO IITE (2020) AI in Education: Change at the Speed Learning also suggests that utilizing AI, Data and analytics, and Machine Learning effectively empowers educators to provide interactive and immersive educational experiences. This approach allows for personalized learning paths tailored to each student, leveraging augmented intelligence and insights derived from their interactions.

Milberg (2024) explains that Artificial intelligence (AI) is poised to revolutionize the education landscape. By automating mundane administrative tasks, such as grading and scheduling, AI can liberate teachers to dedicate more time to their core function: fostering student learning. This shift allows for more personalized attention, enabling educators to tailor instruction to individual student needs and strengths. However, it is essential to emphasize that AI is a tool to augment, not replace, human educators. The irreplaceable qualities of empathy, critical thinking, and creativity remain uniquely human. Its development and implementation must be carefully considered to ensure that AI benefits all students equitably. AI applications in education should be designed to address disparities, making technology accessible to students from diverse backgrounds. By prioritizing equity, we can prevent AI from exacerbating existing educational inequalities.

Beyond its practical applications, AI education itself is crucial. Students should have the knowledge and skills to understand, develop, and critically evaluate AI technologies. This empowers them to become active participants in

shaping the future of AI rather than passive consumers. By fostering AI literacy, we prepare the next generation to harness the potential of AI while mitigating its risks. Hence, it is crucial to delve into the impact of Artificial Intelligence (AI) on education in the contemporary landscape, particularly through the lens of teachers and educators. Understanding how AI influences the educational domain from the perspectives of teachers and educators is essential in unravelling the complexities and implications of integrating AI technologies in teaching and learning practices. By examining the viewpoints and experiences of educators, we can gain valuable insights into the opportunities, challenges, and transformative potential that AI brings to the field of education.

3. Theoretical Framework

A research framework is essential as it provides a structured outline and conceptual map that guides the research process. It helps researchers organize their thoughts, define the scope of the study, and establish a clear direction for their investigation. The research framework for this study centre on the four primary components: perception towards AI, attitude towards AI, artificial intelligence (AI) itself, and the relationship between these variables.

The Technology Acceptance Model (TAM) is integrated to further enrich the understanding of AI acceptance. TAM suggests that individuals' attitudes towards AI, which impacts their behaviour or intention to use AI, significantly influence its perceived usefulness and ease of use.
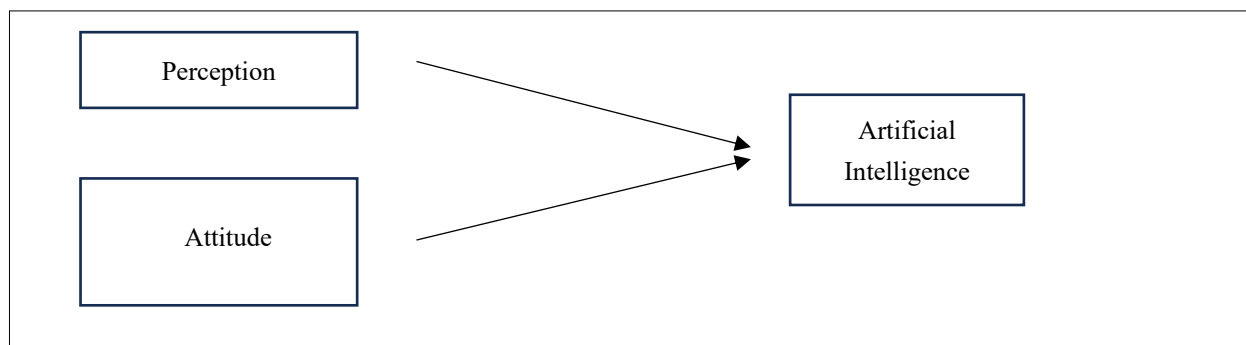
Figure 1. Theoretical Framework for the Study

4. Methodology

4.1 Research Design

The study employed quantitative research design. As described by Watson (2015), quantitative research encompasses a range of methods concerned with the systematic investigation of social phenomena using statistical or numerical data. Therefore, quantitative research involves measurement and assumes that the phenomenon under study can be measured.

4.2 Respondents

This study focused on school teachers in suburban areas. A total of 250 questionnaires were distributed online between February 1 and May 30, 2024, and 205 responses were deemed valid for analysis, yielding a response rate of 82% (Turner, 2020). Participation in the study was voluntary, eliminating the potential for response bias.

4.3 Instruments

The instruments comprised four sections. The initial section gathered demographic information, including age, gender, teaching experience and current school affiliation. Subsequent sections focused on measuring key constructs related to AI acceptance. Perceived usefulness (PU) and perceived ease of use (PEU) of AI were assessed using seven scale-item scales, while attitudes towards AI were evaluated using a similar seven-item measure. All items were rated on a five-point Likert scale ranging from strongly agreed to strongly disagree.

Table 1. Likert Scale Criteria

Criteria	Scale
Strongly agree	5
Agree	4
Neutral	3
Disagree	2
Strongly disagree	1

4.4 Data Analysis Technique

The data was collected using Google Forms and analyzed using SPSS (Statistical Package for the Social Sciences), a widely used software for quantitative research in the social sciences (Field, 2018). Descriptive statistics were employed to summarize the key characteristics of the dataset, providing a clear overview of the sample. This analysis included measures such as means, standard deviations, and frequency distributions, offering insights into response patterns and variability. Additionally, frequency analysis was conducted to examine how often specific responses appeared in the dataset, helping to identify trends and recurring patterns (Pallant, 2020). By combining descriptive and frequency analysis, this study provides a comprehensive understanding of the collected data, enabling meaningful interpretations in relation to the research questions.

5. Results

A total of 205 teachers responded to the survey, providing a diverse and comprehensive data set for analysis. The gender distribution of the respondents was fairly balanced, with 105 (51.2%) females and 100 (48.8%) males participating in the study. This near-equal representation allows for a more nuanced understanding of perspectives across genders.

Table 2. Demographic Profile of Respondents

Demographic profile of respondent		Frequency n = 205	Percent
Age	20 – 30	80	39.0
	31 – 40	97	42.4
	40 above	38	18.5
	Male	100	48.8
Gender	Females	105	51.2
	1 – 10 years	68	33.2
	11 – 20 years	101	49.3
Teaching Experience	21 years above	35	17.1
	Government	136	66.3
Type	Private	69	33.7
of School	Total	205	100.0

In terms of age distribution, the largest group of respondents fell within the 31-40 age group, comprising 87 teachers (42.4%). This was closely followed by those aged 20-30, who made up 80 respondents (39%). Teachers aged 41 and above constituted the smallest group, with 38 participants (18.5%). This age distribution provides insights into the teaching profession's experience levels and generational perspectives.

The survey also explored the years of teaching experience among respondents. The majority, 101 teachers (49.5%), reported having 11-20 years of teaching experience. This significant proportion indicates a well-established workforce with considerable experience. Teachers with 1-10 years of experience accounted for 68 respondents (33.3%), while those with over 21 years of experience made up 35 respondents (17.2%). This data highlights the range of expertise and tenure present within the teaching community, from relatively new educators to seasoned veterans.

Furthermore, the analysis included the type of school where the respondents currently teach, divided into government and private schools. A substantial majority, 136 teachers (66.3%), were from government schools, reflecting a strong representation from the public sector. In contrast, 69 teachers (33.7%) were from private schools. This distinction is crucial for understanding the different environments and resources available to teachers and how these factors might influence their responses.

5.1 Perceived Usefulness

The results are categorized into two main components: perception and attitude. Within the perception category, perceived usefulness is one of the aspects measured. Under perceived usefulness, four key findings were identified. A significant majority, 70.2% of respondents, agreed strongly with the statement that AI tools can enhance teaching effectiveness. It indicates a generally favourable outlook on the potential of AI to revolutionize the classroom. The data further reveals a skewed distribution of responses towards the higher end of the Likert scale, with 60% of respondents strongly agreeing and 29.8% agreeing that AI can improve teaching.

This strong positive sentiment suggests a promising landscape for integrating AI technologies in educational settings. Conversely, only a small percentage, 10.2% of respondents, disagreed or strongly disagreed with the statement, indicating a limited level of scepticism about AI's role in education. This finding underscores the overall optimistic perspective among teachers regarding the potential benefits of AI in the classroom. These results suggest a fertile ground for developing and implementing AI-driven educational tools and resources to address areas such as personalized teaching, student learning needs, enhancing teaching skills, and facilitating administrative and management tasks. As educators become more familiar with AI capabilities, it is anticipated that the positive sentiment towards AI will continue to grow, leading to increased adoption and innovation in the field.
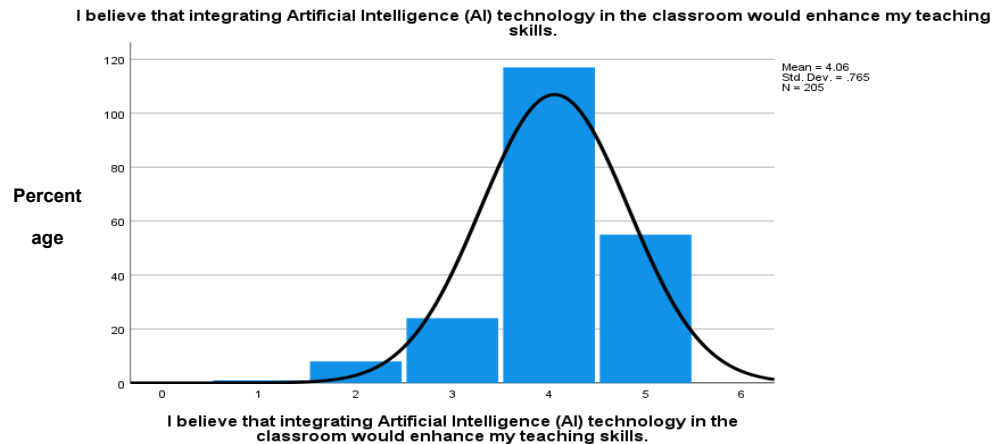
5.1.1 Personalize Teaching Skills
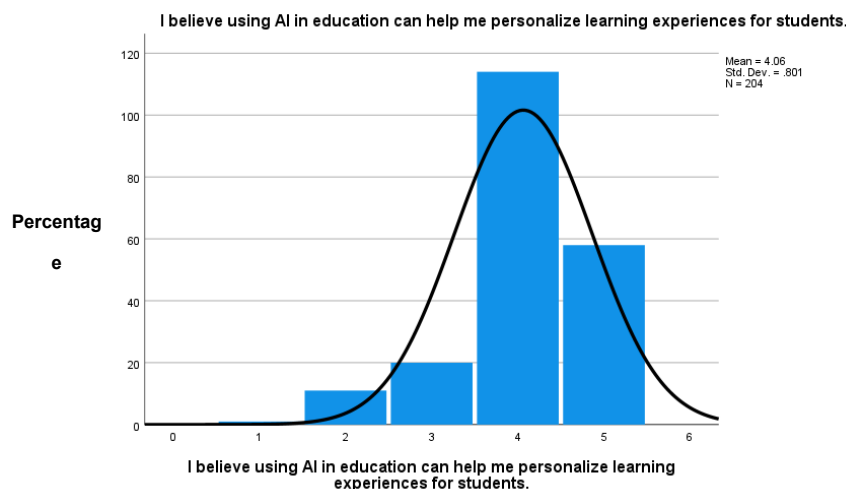
Figure 2. Teacher's Perception towards AI in Personalizing Learning Experience for Students

Integrating Artificial Intelligence (AI) in education can revolutionize how teachers approach personalized learning, making it more efficient and impactful. Personalizing teaching skills with AI involves leveraging technology to meet students' diverse needs, enhance instructional methods, and create a more individualized learning experience.

Next, we will discuss how AI can help teachers personalize their teaching. A significant majority of 114 respondents (55.6%) strongly agreed that AI can be instrumental in personalizing student learning experiences. This positive sentiment was echoed by 58 respondents (28.3%) who also agreed with the statement.

These findings collectively underscore the potential of AI to revolutionize teaching methodologies. While a smaller proportion of 20 respondents (9.8%) expressed neutrality, only a negligible number of 11 respondents (5.4%) disagreed with the notion, suggesting widespread optimism about AI's role in education.

5.1.2 Enhancing Teaching Skills

I believe that integrating Artificial Intelligence (AI) technology in the classroom would enhance my teaching skills.

Mean = 4.06
Std. Dev. = .765
N = 205

Percentage

I believe that integrating Artificial Intelligence (AI) technology in the classroom would enhance my teaching skills.
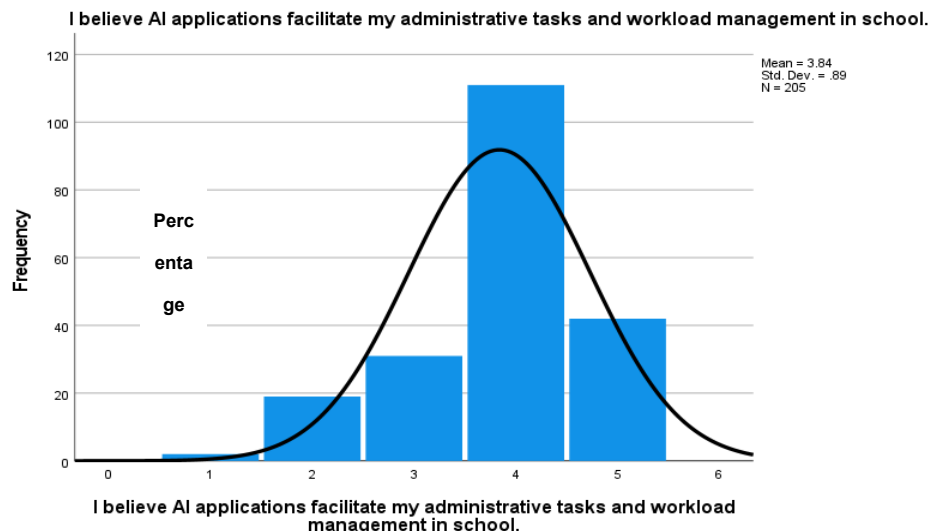
Figure 3. Teacher's Perception towards Integrating AI in the Classroom in Enhancing Teaching Skills

Analysis of the next variable, integrating Artificial Intelligence (AI) technology in the classroom, would enhance teachers' teaching skills.

Most respondents agree that artificial intelligence (AI) can be used in the class and enhance their teaching skills, with 117 respondents (57.1%) agreeing. Other than that, 55 respondents (26.8%) strongly agreed 24 respondents (11.7%) based on neutral, and 8 respondents (3.9%).

5.1.3 Facilitating Administrative and Management Task

I believe AI applications facilitate my administrative tasks and workload management in school.

Mean = 3.84
Std. Dev. = .89
N = 205

Frequency

Percentage

I believe AI applications facilitate my administrative tasks and workload management in school.

Figure 4. Teacher's Perception towards AI Facilitating Their Administrative and Management Task in School

Analysis of teacher perceptions revealed that a substantial majority (54.1%) strongly agreed that AI is significantly beneficial in streamlining administrative and management tasks. Conversely, a small minority (9.3%) disagreed with the notion that AI can facilitate their workload. Analysis revealed that teachers in suburban areas expressed positive views on artificial intelligence (AI) as a tool to enhance their daily work. AI was perceived as instrumental in improving teaching effectiveness, student outcomes, and the overall learning experience. Specifically, teachers valued AI's potential for personalized learning, providing timely feedback, identifying student needs, upgrading teaching skills, and streamlining administrative tasks.

Teachers in suburban areas expressed positive views on AI's potential to enhance personalized learning experiences, as suggested by (Arvin et al., 2024). They also recognized AI's role in boosting teaching skills through data-driven insights and automated tasks. Kitchen et al. (2024) proposed that AI can enhance teachers' roles by automating

routine tasks, providing personalized learning experiences, facilitating data-driven decision-making, and enabling more focused attention on student needs. Moreover, teachers perceived AI as a valuable tool for streamlining administrative and management responsibilities.

5.2 Attitude Towards Artificial Intelligence (AI)

The teachers' attitude is significantly influenced by their approach to integrating artificial intelligence (AI) into their daily teaching and learning activities. This relationship is moulded by how teachers reflect on the effectiveness and implications of AI tools in enhancing student engagement, personalizing learning experiences, and improving educational outcomes. As educators assess the potential benefits and challenges of using AI, their perspectives can either foster a positive environment for innovation or create resistance to change.

5.2.1 Integrating AI Into Teaching
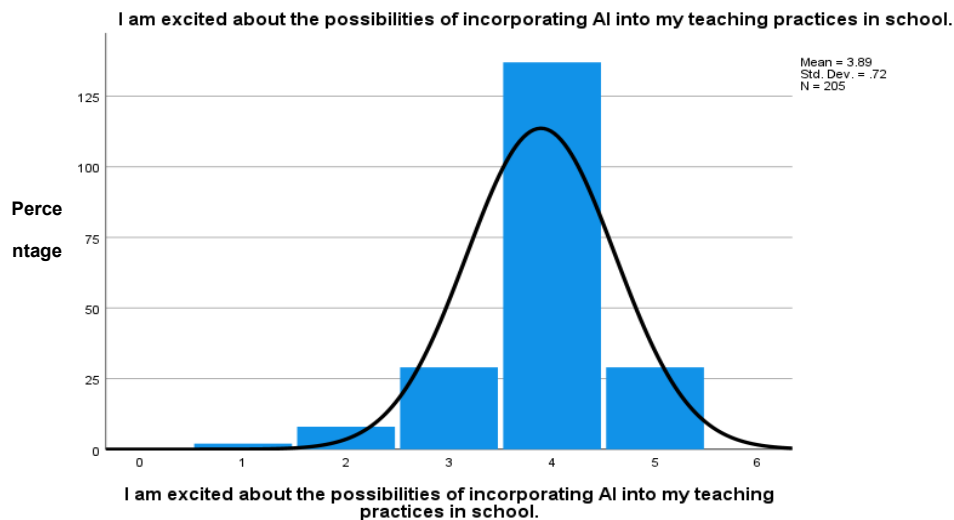
Figure 5. Teacher's Attitude Towards AI in Teaching and Learning

The analysis reveals that 66.8% of respondents agree on the potential of incorporating AI into their teaching practices, recognizing its benefits in enhancing instruction, improving student engagement, and facilitating personalized learning experiences. In contrast, only 3.9% of respondents disagreed, expressing doubts about AI's necessity or effectiveness in suburban schools.

These findings indicate a strong positive sentiment among educators toward AI integration, with most teachers showing openness to exploring its applications in education. The small percentage of dissenting respondents suggests that resistance to AI is minimal, likely stemming from a lack of familiarity, skepticism about its effectiveness, or concerns about its impact on traditional teaching methods.

Overall, the results reflect a growing awareness and acceptance of AI in education, particularly in suburban schools. The willingness of the majority to adopt AI suggests a readiness for innovation and a shift toward more technology-driven teaching approaches. However, to ensure successful implementation, adequate training and resources must be provided to support teachers in effectively integrating AI into their classrooms.

5.2.2 Foster Creativity and Innovation

The findings suggest that AI can significantly enhance creativity and innovation among teachers in suburban areas. 45.4% of respondents strongly agreed that AI tools provide access to resources and ideas that support new teaching methods and approaches. Additionally, 41% agreed that AI can assist in generating personalized lesson plans tailored to students' diverse needs, enabling teachers to explore innovative ways to engage their classrooms. By streamlining lesson planning, AI not only saves time but also encourages educators to experiment with creative instructional strategies they might not have considered otherwise.

I believe that using AI in education will foster creativity and innovation.
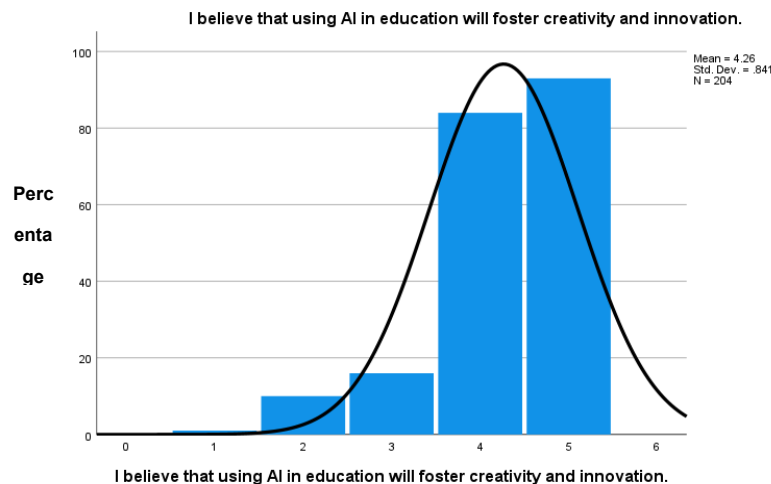
Figure 6. Teacher's Attitude on How AI Foster Creativity and Innovation

However, 7.8% of respondents remained neutral regarding AI's role in fostering creativity and innovation. This uncertainty could stem from several factors, such as a lack of familiarity with AI tools or the need for more concrete evidence of AI's effectiveness in enhancing creative teaching practices. While they may acknowledge AI's potential, they may hesitate to fully embrace it until they gain a better understanding of its practical applications in education.

5.2.3 Problem Solving

I believe that AI is helping me a lot to deal with problems in school.
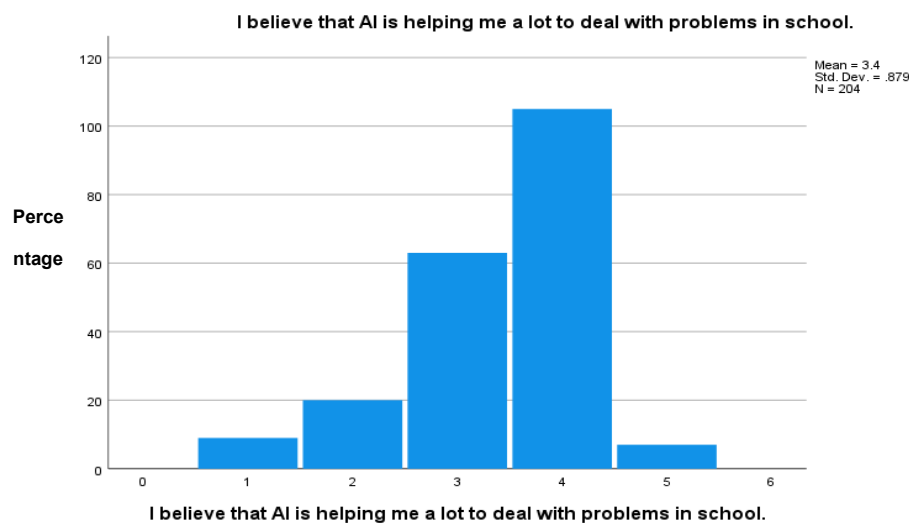
Figure 7. Teacher's Attitude toward AI for Problem-Solving

Artificial Intelligence (AI) has revolutionized problem-solving across various fields, including business and healthcare, by analyzing vast amounts of data, identifying patterns, and learning from experience. This capability allows AI to generate highly efficient solutions, often exceeding human performance. Vrakas and Vlahavas (2008) suggest that AI's problem-solving abilities can be effectively assessed by comparing its performance in addressing complex challenges to that of humans.

In this study, 51.2% of respondents viewed AI as a valuable tool for improving school operations and management. They believe AI can optimize administrative processes, increase efficiency, and support various school-related tasks. This positive outlook suggests a growing recognition of AI's potential benefits in education, particularly among suburban school teachers. However, 30.7% of respondents remained uncertain about AI's role in education, while 9.8% expressed skepticism, likely due to limited familiarity with AI applications in schools.

6. Discussion

This study explores teachers' perceptions and attitudes toward AI integration in suburban schools, focusing on its perceived benefits and the readiness of educators to adopt this technology in the classroom. Artificial intelligence (AI) has been a sought-after technology in the education sector for a long time, and it kindles curiosity among educators about its application to transform transform teaching and learning. This research provides empirical insights into how teachers view AI's role in education, particularly in suburban settings, and examines their confidence and willingness to engage with AI-powered tools. This study builds on our understanding of how and why teachers enjoy (or are confident about) their interactions with these new technologies by offering a more systematic empirical inquiry available as free-to-read results.

A key focus of this study is how teachers perceive AI's relevance to their profession. The findings reveal that educators see AI as a valuable asset in personalizing instruction, addressing students' individual learning needs, enhancing teaching effectiveness, and streamlining administrative tasks. Personalized learning, in particular, emerged as a significant benefit. Teachers recognized that AI could help tailor teaching methods to individual students, making learning more adaptive and responsive. This aligns with broader discussions on the role of AI in adaptive learning environments, where instruction is dynamically adjusted based on real-time student performance data (Luckin et al.; Holmes, 2016). Teachers also thought artificial intelligence (AI) could help to identify and address students' learning needs in the classroom, not just by personalizing instruction. By processing vast amounts of data, artificial intelligence (AI) can recognize and respond to intricate patterns in student behaviour that would otherwise remain discreet. This feature can inform educators on how to intervene and provide students with more contoured resources.

Moreover, enhancing teaching skills through artificial intelligence (AI) integration was highlighted as a significant benefit. Teachers expressed that artificial intelligence (AI) could offer them valuable insights into best practices and provide feedback on their teaching methods, which could be instrumental in their ongoing professional development. This perception is reinforced by existing literature that underscores the potential of artificial intelligence (AI) to serve as a continuous resource for teacher training and skill enhancement (Popenici & Kerr, 2017).

Finally, teachers noted that AI could significantly ease their administrative and management burdens. Tasks such as grading, scheduling, and communication, which often consume a substantial amount of teachers' time, could be streamlined through artificial intelligence (AI), allowing educators to focus more on instructional activities. This finding is consistent with the view that artificial intelligence (AI) can alleviate administrative workload, thereby enabling teachers to dedicate more time to student-centered activities (Luckin et al., 2019). Beyond their perceptions of artificial intelligence (AI's) usefulness, teachers' attitudes toward integrating AI into their teaching practices. The findings suggest that teachers generally have a positive outlook on AI, particularly in their ability to enhance instruction, foster creativity and innovation, and improve problem-solving skills in the classroom.

Teachers expressed a strong interest in integrating artificial intelligence (AI) into their teaching practices, viewing it as a tool that can complement and enhance traditional methods rather than replace them. This aligns with Kim et al. (2013), who suggest that AI is increasingly seen as a collaborative partner, a growing recognition of artificial intelligence (AI) as a collaborative partner in the educational process, where technology and human expertise work together to achieve better learning outcomes.

The findings also highlight AI's role in fostering creativity and innovation in education. Teachers believed that artificial intelligence (AI) inspires new teaching and learning approaches, encouraging educators and students to think creatively. It is particularly relevant in an era where innovation is increasingly valued, and AI is seen as a catalyst for driving pedagogical innovation (Henriksen et al., 2021).

Additionally, the research highlighted teachers' views on artificial intelligence (AI's) potential to enhance problem-solving skills in students. Teachers acknowledged that artificial intelligence (AI) could provide students with advanced tools and resources to approach complex problems more effectively. It aligns with the existing literature that suggests artificial intelligence (AI) can play a crutial role in developing students' critical thinking and problem-solving abilities, which are essential skills in the 21st century (Baker & Smith, 2019).

7. Conclusion

In conclusion, this study examined teachers' perceptions and attitudes toward AI integration in suburban schools. The findings indicate that teachers generally recognize AI as a valuable tool for enhancing personalized learning, improving teaching skills, and streamlining administrative tasks. Moreover, most teachers exhibit a positive attitude

toward AI, particularly in fostering creativity, innovation, and problem-solving in the classroom. However, some skepticism remains, mainly due to a lack of familiarity with AI applications in education. The study highlights the need for professional development programs to equip teachers with the necessary skills to integrate AI effectively into their teaching practices. Education policymakers and school administrators should prioritize AI literacy training, provide user-friendly AI tools, and ensure equitable access to AI-driven resources, especially in suburban schools where technological infrastructure may be limited. As AI technology continues to evolve, its role in education is expected to expand beyond administrative automation and adaptive learning. Future developments in AI-driven teaching assistants, personalized learning algorithms, and intelligent assessment tools could further enhance the effectiveness of AI in education. Additional research is needed to explore long-term impacts and to develop guidelines for ethical AI implementation in schools.

While this study provides valuable insights, it has certain limitations. The research was conducted in suburban schools only, which may limit the generalizability of the findings to urban or rural settings. Additionally, the study relied on self-reported data, which may be subject to response bias. Future studies should consider longitudinal approaches or qualitative interviews to gain deeper insights into teachers' experiences with AI in education. By addressing these considerations, future research and policymaking efforts can help maximize the potential of AI in education while ensuring its responsible and equitable implementation.

References

Akinwalere, S., & Ivanov, V. (2022). Artificial intelligence in higher education: Challenges and opportunities. *Border Crossing, 12*(1), 1-15. https://doi.org/10.33182/bc.v12i1.2015

Alenezi, M. (2023). Digital Learning and Digital Institution in Higher Education. *Education Sciences*. https://doi.org/10.3390/educsci13010088.

Alenezi, M., Wardat, S., & Akour, M. (2023). The Need for Integrating Digital Education in Higher Education: Challenges and Opportunities. *Sustainability*, *15*(6), 4782. https://doi.org/10.3390/su15064782

Arvin, N., Hoseinabady, M., Bayat, B., & Zahmatkesh, E. (2023). Teacher Experiences with AI-based Educational Tools. *AI and Tech in Behavioral and Social Sciences*, *1*(2), 26-32. https://doi.org/10.61838/kman.aitech.1.2.5

Baker, T., & Smith, L. (2019). *Educ-AI-tion Rebooted? Schools and colleges*. Retrieved from https://media.nesta.org.uk/documents/Future_of_AI_and_education_v5_WEB.pdf

Boulay, J. (2016). Artificial Intelligence as an Effective Classroom Assistant. *IEEE Intell. Syst.,* pp. 31, 76-81. https://doi.org/10.1109/MIS.2016.93

Buchanan, R. (2011). Paradox, Promise and Public Pedagogy: Implications of the Federal Government's Digital Education Revolution. *Australian Journal of Teacher Education, 36*, 67-78. https://doi.org/10.14221/AJTE.2011V36N2.6

Celik, I., Dindar, M., Muukkonen, H., & Järvelä, S. (2022). The promises and challenges of artificial intelligence for teachers: A systematic review of research. *TechTrends*. https://doi.org/10.1007/s11528-022-00715-y

Chaudhry, M. A., & Kazim, E. (2021). Artificial Intelligence in Education (AIEd): a high-level academic and industry note 2021. *AI and Ethics*, *2*(1), 157-165. https://doi.org/10.2139/ssrn.3833583

Chen, L., Chen, P., & Lin, Z. (2020). Artificial Intelligence in Education: A Review. *IEEE Access*, *8*, 75264-75278. https://doi.org/10.1109/ACCESS.2020.2988510

Chen, Z., & Ye, R. (2021). Principles of Creative Problem Solving in AI Systems. *Science & Education*, *31*, 555 - 557. https://doi.org/10.1007/s11191-021-00270-7

Chiu, T. K. F., & 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

Chounta, I. A., Bardone, E., Raudsep, A., & Pearce, M. (2021). Exploring teachers' perceptions of artificial intelligence as a tool to support their practice in Estonian K-12 education. *International Journal of Artificial Intelligence in Education*. https://doi.org/10.1007/s40593-021-00243-5

Diamond, J., Posey-Maddox, L., & Velázquez, M. (2020). Reframing suburbs: Race, place, and opportunity in suburban educational spaces. *Educational Researcher, 50*(6), 379-387. https://doi.org/10.3102/0013189X20972676

Dilmurod, R., & Fazliddin, A. (2021). Prospects for the introduction of artificial intelligence technologies in higher education. *ACADEMIA: An International Multidisciplinary Research Journal, 11*(2), 929-934. https://doi.org/10.5958/2249-7137.2021.00468.7

du Boulay, B. (2016). Recent meta-reviews and meta-analyses of AIED systems. *International Journal of Artificial Intelligence in Education*, *26*(1), 536-537.

Du, H., Sun, Y., Jiang, H., et al. (2024). Exploring the effects of AI literacy in teacher learning: An empirical study. *Humanities and Social Sciences Communications, 11*, 559. https://doi.org/10.1057/s41599-024-03101-6

Field, A. P. (2018). *Discovering statistics using IBM SPSS statistics* (5th ed.). Sage.

Gama, J. A. P. (2018, October). Intelligent educational dual architecture for university digital transformation. In *2018 IEEE Frontiers in Education Conference (FIE)* (pp. 1-9). IEEE.

Grab, B., Olaru, M., & Gavril, R. (2019). Self-managed teams as a key to unlocking digital transformation in business management. *Quality-Access to Success*, *20*(176), 280-286.

Henriksen, D., Creely, E., Henderson, M., & Mishra, P. (2021). Creativity and technology in teaching and learning: A literature review of the uneasy implementation space. *Educational Technology Research and Development*, *69*(4), 2091-2108. https://doi.org/10.1007/s11423-020-09912-z

Hwang, G. J., Xie, H., Wah, B. W., & Gašević, D. (2020). Vision, challenges, roles, and research issues of artificial intelligence in education. *Computers & Education Artificial Intelligence, 1*, 100001. https://doi.org/10.1016/j.caeai.2020.100001

Kengam, J. (2020). Artificial Intelligence in Education. https://doi.org/10.13140/RG.2.2.16375.65445

Khazin, K. M., Sanjaya, D., Siregar, M., Meisuri, M., & Adisaputra, A. (2023, June). Comparison of machine translations (MT) technology; statistical (SMT) vs. neural (NMT). In *AIP Conference Proceedings* (Vol. 2732, No. 1). AIP Publishing. https://doi.org/10.1063/5.0133311

Kim, C., Kim, M. K., Lee, C., Spector, J. M., & DeMeester, K. (2013). Teacher beliefs and technology integration. *Teaching and Teacher Education*, *29*, 76-85. https://doi.org/10.1016/j.tate.2012.08.005

Kitcharoen, P., Howimanporn, S., & Chookaew, S. (2024). Enhancing Teachers' AI Competencies through Artificial Intelligence of Things Professional Development Training. *International Journal of Interactive Mobile Technologies (iJIM), 18*, 4-15. https://doi.org/10.3991/ijim.v18i02.46613

Kopp, M., Gröblinger, O., & Adams, S. (2019). Five common assumptions that prevent digital transformation at higher education institutions. In *Inted2019 Proceedings* (pp. 1448-1457). IATED.

Lee, J.-S., & Bowen, N. (2006). Parent involvement, cultural capital, and the achievement gap among elementary school children. *American Educational Research Journal, 43*(2), 193-218. https://doi.org/10.3102/00028312043002193

Lindner, A., & Romeike, R. (2019). Teachers' perspectives on artificial intelligence. In *Proceedings of the 12th International Conference on Informatics in Schools: Situation, Evaluation, and Perspectives (ISSEP 2019)* (pp. 1-8). Larnaca, Cyprus.

Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B. (2016). Intelligence Unleashed: An Argument for AI in Education. Pearson. Retrieved from https://static.googleusercontent.com/media/edu.google.com/en//pdfs/Intelligence-Unleashed-Publication.pdf

Milberg, T. (2024, April). The future of learning: How AI is revolutionizing education 4.0. World Economic Forum. Retrieved from https://www.weforum.org/agenda/2024/04/future-learning-ai-revolutionizing-education-4-0/. Nesta Foundation

Popal, A., Negussie, D., Hirgo, J., Negussie, Y., Tolani, C., & Japee, G. (2024). The impact of technology on higher education in the 21st century: A systematic literature review. *GAP iNTERDISCIPLINARITIES - A Global Journal of Interdisciplinary Studies, 7*, 120-126.

Popenici, S., & Kerr, S. (2017). Exploring the impact of artificial intelligence on teaching and learning in higher education. *Research and Practice in Technology Enhanced Learning, 12*. https://doi.org/10.1186/s41039-017-0062-8

Railean, E. A. (2017). Impacts of digital revolution on learning. *In User interface design of digital textbooks* (pp.1-22). Lecture Notes in Educational Technology. Springer. https://doi.org/10.1007/978-981-10-2456-6_1

Sanjaya, D., Siregar, M., Riswanto, R., Yusuf, M., & Husain, M. P. M. (2023, June). Developing symbolized corrective feedback application machine for English writing using deep learning (DL) technology. In *AIP Conference Proceedings* (Vol. 2732, No. 1). AIP Publishing. https://doi.org/10.1063/5.0133373

Shenkoya, T., & Kim, E. (2023). Sustainability in Higher Education: Digital Transformation of the Fourth Industrial Revolution and Its Impact on Open Knowledge. *Sustainability.* https://doi.org/10.3390/su15032473.

Turner, D. P. (2020). Sampling methods in research design. *Headache, 60*(1), 8-12. https://doi.org/10.1111/head.13707

UNESCO IITE. (2020). *AI in education: Change at the speed of learning* (UNESCO IITE Policy Brief). Author: S. Duggan. Editor: S. Knyazeva. ISBN 978-5-6046449-2-8.

Vrakas, D., & Vlahavas, I. (Eds.). (2008). *Artificial intelligence for advanced problem-solving techniques*. IGI Global. https://doi.org/10.4018/978-1-59904-705-8

Watson, R. (2015). Quantitative research. *Nursing Standard (Royal College of Nursing (Great Britain): 1987), 29*(31), 44-48. https://doi.org/10.7748/ns.29.31.44.e8681

Wood, R. M. (2023). A review on education differences in urban and rural areas. *Case Study - International Educational Research Journal, 14*(2). https://doi.org/10.14303/2141-5161.2023.254

Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). *Systematic review of research on artificial intelligence in education*. *Educational Technology Research and Development, 67*(3), 543-568. https://doi.org/10.1007/s11423-019-09677-0

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