CHAPTER 9

ROLE OF ARTİFİCİAL INTELLİGENCE İN ENHANCİNG MOTİVATİON AMONG STUDENTS İN DİGİTAL CLASSROOMS

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Abstract

The dynamics of student involvement have been completely transformed in recent years by the use of artificial intelligence (AI) in education, especially in online classrooms. The present analysis looks at how AI-powered tools can improve student motivation and involvement. Through the use of customized feedback, adaptive learning methods and AI has the power to revolutionize conventional teaching methods through intelligent tutoring systems. The study examines a number of AI systems that enable real-time communication and offer customized learning opportunities, including chatbots, virtual assistants, and data analytics. The impact of AI on student motivation through gamification and interactive content delivery is also covered. The study emphasizes the advantages, difficulties, and potential applications of AI in digital classrooms, stressing the significance of ethical issues and fair access. The goal of this study is to present a thorough understanding of how AI can be applied to create a more stimulating and productive learning environment.

Keyword: *AI-Powered Student Engagement, Digital Classrooms, Tutoring Systems, Virtual Assistants.*

Introduction

In the field of education, attaining successful learning outcomes and facilitating a deep engagement with the subject matter depends on student motivation. The procedure for becoming an expert in one's area requires pupils to have a great deal of enthusiasm to succeed; educators have investigated several ways to promote motivation in educational settings. The incorporation of artificial intelligence (AI) technologies is one intriguing approach that has surfaced (Rizvi, 2023).

According to Banuchittara *et al* (2024) Artificial intelligence (AI) has advanced so quickly in recent years that it has drastically changed several industries, including education. The need for adaptable and accessible learning environments has led to an increase in the use of digital

classrooms. Ensuring student interest and participation in these digital environments is still a significant concern, though. In virtual classrooms, where the lack of physical presence can result in less participation and interest, conventional means of encouraging student interaction sometimes fall short. AI-powered solutions have the chance to transform student engagement by filling this gap.

In digital classrooms, AI technologies present intriguing methods to improve student motivation and involvement. AI can produce more dynamic and responsive learning environments through intelligent tutoring systems, customized learning experiences, and real-time feedback mechanisms. In addition to accommodating different learning styles and speeds, these technologies give teachers important information on the performance and engagement levels of their students (Im *et al*, 2025). AI has enormous potential that improve educational results, but in order to fully realize its advantages, careful integration and use are needed. The intent of this review is to examine the different AI-powered tactics and resources that can improve student motivation and engagement in online learning environments. Study aims to provide a thorough grasp of how AI may be used to produce more effective and interactive learning experiences by looking at both present applications and potential future developments (Hwang and Tu, 2021).

Background

Rizvi (2023) reported that Artificial Intelligence (AI) is advancing so quickly that it is changing several industries, including education. AI has a big impact on students' academic growth in both general and higher education by presenting a variety of opportunities and difficulties. AI could transform education and meet the many demands of students, from individualized learning experiences to intelligent tutoring programs that offer customized advice, assistance, and feedback based on individual learning patterns and knowledge levels. By offering interactive content, adaptive feedback, and tailored learning experiences, AI-powered tools and platforms present viable options. By analyzing student behavior, preferences, and performance, these technologies allow teachers to customize their lesson plans to each student's needs. By utilizing AI, teachers may design more stimulating and engaging classrooms that accommodate a variety of learning preferences and encourage active engagement (Bower, 2016).

According to (Vieriu and Petrea, 2025) in traditional education, students are encouraged to actively participate in their education by honing their analytical, problem-solving, and exploratory skills. The development of critical thinking abilities is crucial for influencing students' entire educational experiences. Teachers frequently use questioning strategies, group projects, and assignments to improve students' capacity to assess data and generate their own opinions. But AI's quick information processing and perceptive answers put conventional learning techniques to the

test, casting doubt on the differences between human and machine-based learning. For instance, Nasimovna (2022) stated that although AI is capable of processing and analyzing data effectively, it could not have the same sophisticated comprehension and inventiveness as human intellect. This emphasizes the necessity of integrating AI in a balanced way so that technology enhances rather than replaces human interaction and the growth of critical thinking abilities.

The practical use of AI in education is not difficult. A deep comprehension of both the technology and the learning process is necessary for the successful integration of AI in education. Ethical issues add to this complexity, particularly considering the growing application of generative artificial intelligence (Banuchittara *et al*, 2024). For example, Bower (2016) draws attention to the danger of students abusing AI technologies in dishonest or unauthorized ways, including exploiting content created by AI to do assignments without giving due credit. To provide educators, policymakers, and academics with practical applications, this study carefully examines the effect of artificial intelligence on student motivation throughout specialized formation. To ensure that such integration stays in line with moral standards while safeguarding student privacy and encouraging responsible usage, ethical issues pertaining to AI utilization are also covered.

Theoretical frameworks of motivation

Motivation is an elaborate concept that motivates people to act and persevere in reaching their objectives. Self-Determination Theory (SDT) and Expectancy-Value Theory (EVT) are two theoretical frameworks that have been established to better understand how Artificial Intelligence (AI) might be utilized to boost student motivation during specialized education.

According to SDT, in order for a person to experience intrinsic motivation, engagement, and well-being, their innate psychological needs for autonomy, competence, and relatedness must be met. AI technologies are uniquely able to give students autonomy by enabling them to customize learning pathways based on their own interests; adaptive feedback mechanisms facilitated by AI improve true comprehension through tailored guidance according to each learner's progress; and collaborative activities enabled by the technology facilitate connectedness between peers who have similar goals (Song and Wang, 2020).

Furthermore, EVT suggests that people are motivated to succeed by belief systems about task value and success expectations. In this sense, AI can be extremely helpful in raising expectations of success and perceived worthiness through tailored content delivery techniques based on each user's performance history or degree of expertise (Im *et al*, 2023).

Holmes and Tuomi (2022) stated that Redefining Cognitive Evaluation Theory: Using AI to Encourage Student Motivation in the Development of Specialists. The importance of intrinsic

motivation and extrinsic rewards in determining an individual's engagement and performance is highlighted by Cognitive Evaluation Theory (CET). According to CET, a person's internal motivation to learn may decline if they perceive external rewards as controlling. However, intrinsic motivation may be increased when these rewards are viewed as informative and support autonomy. As a result, while undergoing specialized training, AI technologies can encourage students' self-motivation by offering insightful feedback that strengthens their competence and independence.

It is crucial when incorporating theoretical frameworks like autonomy, competence relatedness expectancy value, and intrinsic motivation into the design process of AI in order to optimize its beneficial effects on student motivation during specialized training. By doing this successfully, we create individualized adaptive learning experiences that allow students to participate with more enthusiasm than ever before (Rizvi, 2023). Further, any successful implementation needs to take into consideration how to use words or phrases for maximum effect; every word should have meaning; verbs need to be strengthened; adjectives need to have more impact; all of these factors work together to create an educational system that are able inspire students to continue their studies and become specialists.

Role of AI in Digital Classroom

With their unparalleled access to educational resources and adaptable learning environments, digital classrooms have completely transformed the education industry. But this change has also brought about problems with student motivation and engagement, which are essential components of successful learning. By improving student engagement and motivation in virtual classrooms, artificial intelligence (AI) offers a promising way to tackle these issues. Following are the various AI-powered tools and methods that might improve educational outcomes by encouraging student engagement in digital classrooms (Chui and Chai, 2020).

1. Addressing the Engagement Gap in Digital Classrooms: Students frequently experience alone and cut disconnected from their teachers and peers as a result of the shift to digital classrooms, which has revealed a large engagement gap. Reduced motivation, poor academic achievement, and increased dropout rates can result from this disengagement. Personalized learning assistants, interactive chatbots, and intelligent tutoring systems are examples of AI-powered solutions that can produce more dynamic and interesting learning environments. AI can help close the engagement gap and promote a more inclusive and participatory learning environment by customizing content to each student's needs and offering real-time feedback (Nasimovna, 2022).

2. Increasing Student Motivation with AI: According to (Arnadi, Aslan and Vandika, 2024) in digital learning environments, student success is largely determined by motivation. In virtual environments, traditional motivational techniques like peer interaction and instructor-led encouragement are less successful. By providing gamified learning modules, personalized learning paths, and adaptive learning experiences, AI may significantly boost student motivation. These AI-powered methods can accommodate a variety of learning styles, increasing students' motivation and enjoyment of their studies. AI can help students maintain their interest in learning and enhance their general academic performance by keeping them motivated.

3. Assisting Teachers with AI-Powered Tools: Teachers must manage digital classrooms with a variety of challenges, such as sustaining student engagement, giving prompt feedback, and attending to each student's unique needs. By automating repetitive processes like grading and attendance monitoring, AI-powered tools can help teachers free up their time to concentrate on more meaningful interactions with students. Additionally, AI can give teachers useful information about student performance and engagement levels, allowing them to spot at-risk pupils and take early action. This assistance can improve student outcomes and increase the efficacy of instruction (Arnadi, Aslan and Vandika, 2024).

4. Encouraging Collaborative Learning: Song and Wang (2020) reported that the crucial component of education fosters teamwork, critical thinking, and communication skills. By enabling virtual group projects, discussion boards, and peer review systems, artificial intelligence (AI) can promote collaborative learning in digital classrooms. AI-driven systems can pair students with similar interests and skill sets, guaranteeing fruitful partnerships. AI can increase student motivation and engagement by promoting a sense of community and group learning.

5. Giving immediate Feedback and Evaluation: Students' learning and growth depend on prompt feedback. AI can give students immediate feedback on their participation, quizzes, and assignments so they can see their progress and areas for improvement right away. By reducing the time between effort and recognition and offering opportunities for ongoing learning, this real-time assessment keeps students motivated and involved (Holmes and Tuomi, 2022).

6. Combining AI with Emerging Technologies: Combining AI with other cutting-edge technologies, like augmented reality (AR) and virtual reality (VR), can produce engaging and dynamic learning environments. By simulating real-world situations and offering practical learning opportunities, these technologies can increase student motivation and engagement. The synergies

between AI and emerging technologies in the context of digital education will be examined in this paper (Tamrin and Masykuri, 2024).

7. Future Directions and Innovations: Vieriu and Petrea, (2025) said that the field of artificial intelligence in education is always changing, with new developments and uses appearing on a regular basis. Future directions for AI-powered student engagement will be examined in this paper, including developments in intelligent agents, machine learning algorithms, and natural language processing. The paper can assist researchers and educators in staying ahead of trends and getting ready for the next generation of digital learning environments by pointing out possible future developments.

Ways to enhance Motivation through AI among Students (Rizvi, 2023)

1. AI based personalised learning and adaptive response: One important aspect of improving learning outcomes is the use of artificial intelligence (AI) to boost student motivation during specialist formation. AI capabilities give students individualized, flexible experiences that take into account their unique needs and interests. These systems are able to tailor instruction, activities, content, and feedback to the specific needs of each learner by using complex algorithms.

- **Individualized Education: Unique Strategies & Content:** AI technologies give teachers the ability to customize the educational experience for each student by providing data-driven insights into their preferences and progress. Courses can be customized based on students' strengths, weaknesses, and interests in order to create an engaging environment that optimizes learning potential. This includes instructional strategies, content selection, and even the actual learning experiences.

Intelligent tutoring systems (ITS) are one instance of AI-enabled personalized learning. These cutting-edge systems use AI algorithms to evaluate students' abilities and knowledge, identify any comprehension gaps, and offer specialized guidance and assistance. ITS's ability to dynamically modify the degree of difficulty, pace, and content in accordance with each student's skills and progress is a testament to its adaptability, ensuring that each person is suitably challenged while receiving the required guidance.

- **Adaptive Feedback:** Supportive Guidance & Reinforcement: Adaptive feedback mechanisms are crucial for increasing student motivation while developing specialists, in addition to the personalized instruction pathways made possible by AI technology. Instead of using

conventional one-size-fits-all methods, these systems evaluate students' answers on particular tasks before providing tailored advice or assistance based on the information gathered. This kind of practical guidance not only supports accomplishments but also offers insightful guidance where opportunities for improvement exist, motivating students to achieve successful results (Banuchittara, *et al,* 2024).

Banuchittara *et al* (2024) also argued that when it comes to specialist formation, the integration of personalized learning and adaptive feedback within an AI-driven environment offers many advantages, including personalizing the experience promotes learners' autonomy while also fostering a sense of ownership over their own journey; additionally, they receive targeted assistance through ongoing guidance to stay motivated throughout their development process. Students can feel competent and relevant thanks to this type of contextualized instruction, which ensures that engagement levels stay high throughout the entire process.

2. Examining the advantages of personalized and gamified AI education: Gamification offers a chance to increase student motivation and engagement in the classroom. Students can become engrossed in an engaging yet interactive environment that piques their interest by incorporating game elements like levels, badges, leader boards, and rewards into the learning process. These elements are all powered by Artificial Intelligence (AI) technologies. Educational platforms can help foster more successful outcomes than ever before by utilizing intrinsic motivations like challenge and curiosity in conjunction with personalized experiences that are tailored to each student's skill level or pace of learning thanks to AI algorithms (Hwang and Tu, 2021).

Educators are increasingly choosing to use artificial intelligence (AI) to power gamified learning. AI enables students to measure their progress and accomplishments in a structured manner by offering real-time feedback and progress tracking. Personalized improvement suggestions, performance dashboards, and interactive visualizations all contribute to the development of self-awareness and efficacy—two essential elements for maintaining motivation. Though introducing AI into educational settings requires careful consideration regarding objectives as well as instructional strategies to ensure relevance; educators must also provide guidance throughout the process so that gameplay remains meaningful while teaching essential skills necessary for success later on in life (Syafitri and Hasanah, 2022).

3. Emotional Support and Emotional Interaction promotes Motivation: According to (Saseanu, Gogonea and Ghita, 2024) emotional and social engagement play a major role in

Artificial Intelligence's (AI) ability to boost student motivation during specialist formation. By permitting interactions that recognize and react to students' emotions, AI technologies can make educational experiences more immersive, personalized, and meaningful. Understanding how individuals are feeling through their body language, tone of voice, facial expressions, and other cues is an essential aspect of this process. AI systems that analyse these indicators enable personalized instruction that changes based on a person's mood or state. Additionally, through conversational interaction with AI-powered virtual assistants, more advice and support are provided from a source that can sympathize when necessary.

AI for emotional and social engagement in education offers fascinating chances for cooperation, communication, and peer learning. Using cutting-edge algorithms to link students who have similar interests can foster a sense of community and encourage student participation. People can share ideas and develop critical social-emotional skills like empathy and effective communication through online forums, virtual classrooms, and other AI-powered platforms. Moreover, simulated scenarios that are intended to improve these skills provide an immersive chance for individual development in a nurturing setting (Syafitri and Hasanah, 2022).

However, when using these technologies in the classroom, ethical issues must be taken into account. To guarantee that student privacy is always protected, clear data security policies must be established. This includes controlling the collection and use of data from any sources pertaining to emotions or social interactions that are obtained through the use of AI tools.

By maintaining strict guidelines for the responsible use of information technology in educational systems today, we will build solid foundations that will enable future generations to safely construct their own knowledge without fear or compromise on their fundamental legal rights as citizens, ultimately giving them greater access to success in both their personal and professional lives (Rizvi, 2023) and (Banuchittara *et al*, 2024).

Conclusion

`In the field of education, the application of artificial intelligence (AI) to increase student motivation during specialist formation is a rapidly expanding and very promising area. This review has highlighted various ways that AI can boost student enthusiasm, including gamification, personalized learning, adaptive feedback, and social and emotional engagement. AI technology integration offers a revolutionary chance to raise student motivation and engagement in online learning environments. AI-enabled personalized learning enables students to have experiences

tailored to their own needs, interests, and pace. When it comes to investigating different aspects of knowledge acquisition, gamification in conjunction with artificial intelligence offers exciting opportunities to create motivational scenarios. Another area where AI is crucial to boosting student inspiration is adaptive feedback. Lastly, it is important to consider the emotional and social connections that exist between the parties involved in the teaching/learning dynamic. These connections are easily made possible by modern technology, which has built-in capabilities powered by artificial intelligence itself, fostering strong relationships based on mutual trust over understanding one another better than before those interactions took place in the first place. In short, as AI develops further, integrating it into digital classrooms presents previously unheard-of chances to rethink pedagogical strategies and foster a more welcoming, interesting, and student-centred learning environment. By responsibly embracing these technological developments, educators and stakeholders can work together to harness AI's transformative power to develop a generation that is prepared for the future and has the capacity for lifelong learning.

References

Arnadi, A., Aslan, A., & Vandika, A. Y. (2024). The Use of Artificial Intelligence for Personalizing Learning Experiences. *Journal of Educational Science and Local Wisdom, 4*(5), 369-380.

Banuchittara, P., Chaudhary, G., Gupta, R.K., Mishra, R., & Mahadevan, P. (2024). AI powered student engagement: Enhancing interaction and motivation in digital classrooms. *European Economic Letters, 14* (2), 2809-2819.

Bower, M. (2016). Augmented reality in education: Current technologies and the potential for educational applications. *Journal of Educational Technology Development and Exchange, 9*(1), 4-18.

Chiu, T. K., & Chai, C.-s. (2020). Sustainable curriculum planning for artificial intelligence education: A self-determination theory perspective. *Sustainability, 12*(14), 5568-5573.

Holmes,W., & Tuomi, I. (2022). State of the art and practice in AI in education. *European Journal of Education, 57* (1), 542–570.

Hwang, G.-J., & Tu, Y.-F. (2021). Roles and research trends of artificial intelligence in mathematics education: A bibliometric mapping analysis and systematic review. *Mathematics, 9*(6), 584-590.

Im, R., Umasugi, M., Umasugi, H., Adam, A., Lumbessy, S., &Juliadarma, M. (2025). Analysis of the influence of AI on student learning Motivation in the digital Era. Electronic Journal of *Education, Social Economics and Technology, 6*(1), 196-201.

Nasimovna, N.A. (2022). New pedagogical technologies in teaching English language to students with no specialized foreign language. *American Journal of Pedagogical and Educational Research, 6* (1), 76-79.

Rizvi, S. (2023). Revolutionizing student engagement: Artificial Intelligence's impact on specialized learning motivation. International Journal of Advanced Engineering Research and Science, 10 (9), 27-31.

https://dx.doi.org/10.22161/ijaers.109.4

Saseanu, A. S., Gogonea, R. M., & Ghita, S. I. (2024). The social impact of using artificial intelligence in education. *Amfiteatru Economic, 26*(65), 89–105.

Syafitri, N., & Hasanah, N. (2022). "The Use of AI Technology in Distance Learning." *Indonesian Journal of Educational Technology, 10*(3), 85-95.

Tamrin, H., & Masykuri, A. (2024). Innovation of technology-based learning methods in enhancing student learning motivation. *Journal of Islamic Educational Development, 1*(1), 63 72.

Vieriu, A.M., & Petrea, G. (2025). The impact of Artificial Intelligence (AI) on students' academic performance. Education Sciences, 15(3), 1-12.