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"Role of Blended Learning Facilitates Artificial Intelligence in Teaching-Learning Enhances Students in Modern Inclusive Classroom Settings"

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Abstract

The contemporary study explores how blended learning (BL) facilitates artificial intelligence (AI) in teaching-learning and enhances students in modern inclusive classroom settings. When combined, BL and AI have the potential to radically alter the way we teach in modern, inclusive classrooms. One potential application of AI in the classroom is the generation of personalized lesson plans for each student based on their BL and test scores. Adaptive learning activities and BL can be tailored to meet each student's needs by considering their strengths, weaknesses, and learning styles. Ultimately, AI-integrated blended learning environments enhance teaching and learning in modern, inclusive classrooms through adaptive learning approaches, data-driven insights for educators, personalized learning experiences, increased accessibility and inclusivity, real-time assessment and feedback, collaboration and engagement, and support for teachers' professional development. These developments bode well for the future of education, which promises to be increasingly digital and connected with BL in teaching-learning, benefiting students in modern, inclusive classroom settings. By tailoring the difficulty and pace of training to each student, personalized learning has numerous positive effects, including improved focus and understanding. With this level of adaptability, content can be delivered at just the right difficulty, which helps students stay engaged and learn more effectively. The information AI provides can greatly benefit teachers, offering them valuable insights. The submission of AI in BL allows teachers more control over their students' independence and flexibility.Conversely, AI-enabled advanced tools can supplement human teachers to enhance educational outcomes and strengthen student-teacher relationships. Based on those outcomes, teachers can use AI to see how students interact and intervene with individualized support or enrichment activities. The efficiency of teaching and students' overall performance are improved by adopting this data-driven approach. Incorporating AI into BL systems allows pupils to receive real-time feedback while simultaneously lightening the load on teachers. Another great way these tools encourage active engagement is by measuring students' level of participation in BL in teaching-learning, which enhances students in modern inclusive classroom settings.

Keywords: *Role, Blended Learning, Facilitation, Artificial Intelligence, Teaching-Learning, Enhancement, Student, Modern, and Inclusive Classroom Settings*

Introduction

Today's diverse classrooms cannot function without AI-powered BL, which enhances instruction and student participation. AI systems can evaluate students' strengths, weaknesses, and preferences of learning styles. With this data, teachers will be better equipped to address each student's needs. BL incorporates these outcomes into classes to ensure that students receive an appropriate level of support and challenge. Combining online and traditional classroom activities makes BL a viable teaching method. The thorough introduction covers all aspects of BL, including theories, models, implementation methodologies, and future advancements. BL encourages students to actively participate and work together, utilizing concepts from both science and socio-cultural. Using cognitive load theory and multimedia education, you can improve your ability to create and distribute information in digital form. One method that allows for personalization and flexibility is the flipped classroom paradigm. Rotation and flexibility are two more. We strongly advocate for policies encouraging student agency, properly supporting career development, and laying a solid groundwork for technology. BL enhances students' learning capacity by giving them more control and making course content more accessible. Based on their research, Khan et al. (2012) concluded that BL encourages students to engage in class discussions actively, complete assignments independently or in small groups, and present and defend their discoveries. Through these BL activities, students will deepen their understanding of the subject matter and develop vital modern skills, such as social and technological abilities. Integrating multimedia into BL is one of its dynamic features that attracts and retains the attention of a wider group of pupils. AI has numerous potential uses, including providing students with engaging educational media such as movies, simulations, and interactive quizzes. One significant advantage of AI-driven assessment systems for students is the ability to automate the grading process and obtain replies much more quickly. As a result of this change, teachers can devote more attention to meeting their students' individual needs and spend less time on paperwork. Artificial intelligence systems can improve their recommendation-making abilities by integrating human input and interaction. This iterative technique enhances every student's educational experience. Teachers in today's multi-ethnic classrooms can give their students a leg up by integrating AI with more conventional educational approaches. With the support of captivating and tailored lessons, which enhance students in modern inclusive classroom settings.

Role of Blended Learning in Education

BL strategies that combine online and in-person instruction are becoming increasingly common in schools (Graham, 2013). Using BL in combination with both online and conventional classroom resources is rapidly replacing the former as the method of choice. Individualized instruction may meet the needs of all students. The students have the option to learn in a more conventional classroom setting, using online resources alone or a combination of the two. Some experts have referred to this style of schooling as the new standard or conventional, according to Ross and Gage (2006). Evidence shows that BL can improve classroom instruction by encouraging student participation and self-directed learning. Vo et al. (2017) and Smith and Hill (2019) are notable works in this field. Among the many benefits of taking classes online is the freedom to study at your own pace and in your own time. Due to the inherent fluidity of creative undertakings and the absence of generally accepted norms, institutional management of these endeavours has proven challenging (Oliver &Trigwell, 2005).More realistic personalized evaluations, interactive information, and adaptable learning pathways are all made possible by internet technologies that are accessible at all times. Allowing pupils to select their learning style is the fundamental premise of this approach. BL's adaptability stems from its capacity to accommodate a wide range of student needs with the incorporation of both static and dynamic elements. As an alternative, students can engage in a variety of classroom activities through the use of multimedia tools, online discussion forums, simulations, and collaborative endeavours. Teachers have a toolkit complete with tactics they can employ to pique their pupils' interest and get them invested in the subject. As compared to traditional classrooms, BL's online format allows students to delve more deeply into course material. Students can improve their understanding of complicated concepts and foster their creative thinking abilities through the use of online

resources such as movies, blogs, podcasts, and simulations. Our goal in offering students a variety of materials is to encourage them to think creatively and critically about real-world situations. When compared to the current system, only time will tell when BL saves money. There might be savings on shipping and building maintenance expenses when there is less demand for paper and textbooks. Online assignment submission and feedback would free up teachers' time to focus on instruction and enhance students in modern, inclusive classroom settings.

The Online Learning Consortium conducted preliminary research and found that approximately 65.2% of the involved schools provided BL in some capacity (Allen & Seaman, 2003). It was in 2008 that the United States Department of Education commissioned a study to investigate online learning in the country (Lewis & Parsad, 2008). Students' reliance on conventional classroom instruction decreases as an outcome of BL, and their proficiency in both online and in-person learning increases. In a survey of twelve million students, 25% said they used hybrid methods, and 11% said they did. Having the ability to use different web resources successfully is a crucial talent to have in today's world. BL enhances students' critical digital literacy in numerous ways, such as teaching them to collaborate online, engage in class debates, and develop independent proficiency on multiple platforms. These abilities are highly sought after, both professionally and academically. With this individualized strategy, every student will receive the support they require to achieve their goals. Significant to BL's guiding principle of student achievement is the integration of internet resources with more conventional classroom training. Students in today's competitive job market need skills, including active participation, technical proficiency, the ability to tailor their education, and adaptability. In today's schools, BL is a must-have tool since it integrates online resources with traditional teaching methods. With BL, people can learn the way that works best for them. Many of the issues that arise in conventional classrooms can be avoided by administering assignments and exams online. People whose schedules are challenging to forecast, working students, and adults pursuing further education. Using BL, educators can personally address the needs of their students in the inclusive classroom settings.

What is Artificial Intelligence

Since change is inherent to existence, the capacity to adapt to and even prosper amidst continual change is essential to human flourishing. This is particularly true in the medical and pharmaceutical industries, where innovative drug testing and discovery methods have recently accelerated progress. A contributing factor to AI's meteoric rise in popularity is its better automation capabilities, which allow it to manage massive amounts of information. AI describes computer programs that mimic human intellect in Learning and decision-making. This system uses intricate tools and networks to simulate human intellect. Our medical planning and item assembly capabilities do not allow us to handle the challenges of tailored medicine. Recent advances in genetics, diagnostics, and analytical methods have accelerated the development of new drugs. Developing biomarker-based, tailored medications might be a boon to this sector. With the help of machine learning algorithms and a user-friendly interface, AI can analyse stakeholders, market share, and competitors to generate analytical roadmaps. Marketing experts can use this to optimize market share gain, reverse negative sales, or forecast investment opportunities. These roadmaps can help pharmaceutical sales professionals improve decision-making and expand their market share by improving their ability to anticipate vital sales aspects. They derive their advice or opinions from thorough investigation and analysis and apply specified standards to form conclusions. Transportation, healthcare, banking, and the creation of autonomous vehicles are just a few industries starting to use AI for their students in inclusive classroom settings.

The pharmaceutical industry might make drug repurposing even more effective with the help of artificial intelligence and big data (Agrawal, P., Kushwaha, V., & Khan, N. F,2023). The whole definition of AI has changed. According to Kaplan and Haenlein (2019), AI is the ability of a system to understand and handle outside information, learn new things, and apply what it has learned to accomplish set goals while adjusting to unexpected circumstances. Johns and Poole's (2010) study on AI primarily focuses on intelligent computer agents.

Machines that can mimic human cognitive abilities are known as AI. The main focus of this field of studies is the study and development of AI software, as well as AI concepts and studies. Irrespective of whether AI follows physiologically observable approaches or not, the end goal of AI is to understand brain operation computationally. The history, definition, applications, evolution, and achievements of artificial intelligence are covered thoroughly. AI focuses on machines with the ability to learn and react. A system's pursuit of self-optimization exemplifies intelligent behaviour. AI is a computer science subfield that studies machine learning and its potential to mimic human intelligence. Regarding AI, robotics is the subfield that studies how to direct and control mechanical and non-living things. Automated reasoning allows robots to move around, carry out activities, and complete occupations with minimal human input. When making decisions, their students use these AI systems in inclusive classroom settings.

The machine learning branch of artificial intelligence aims to teach computers new abilities rather than program them to do predefined tasks. Deep Learning is a subfield of Machine Learning that primarily deals with using to make predictions. Supervised, unsupervised, and reinforcement learning are the three primary schools of thought in machine learning. It is feasible that this method can operate autonomously as it does not depend on sensitive information. Supervised Learning, which attempts to derive a function from a collection of inputs and an expected outcome, is employed for this purpose. Computers are taught to select the best evaluation option through reinforcement learning, which involves progressively boosting the quality of the reward. AI specialists work to enhance computers' cognitive, behavioural, and visual capacities. But some people are very outspoken in their disagreement. The amount of information produced by computers and humans is increasing exponentially, exceeding our ability to process, comprehend, and apply it. Thanks to the fast development of AI, robots will soon be able to learn and make complex decisions without human input. AI fundamental abilities are reasoning, comprehension, planning, sensing, interacting, and skill improvement. Study in this field primarily aims to bridge the gap between theory and practice by teaching students the fundamentals of AI software development (Saini, N, 2023). AI systems can perform a wide range of tasks with a level of cognition similar to a human. Much study and conversation have focused on general AI, a relatively new topic. Just in case you didn't catch it, AI is a collection of methods and technologies that let computers think more intelligently than humans, fix their mistakes better, and do jobs that were once reserved for humans that can personally address the needs of their students in inclusive classroom settings.

Artificial Intelligence in Teaching-Learning

AI has the potential to significantly impact several sectors of education, including assessment tools, course structure, school administration, and curriculum development. Schools and colleges must change to bring about a new learning age by working together with AI. Just as with other recent technological and scientific triumphs, the rapid development of AI will impact every facet of human existence. The increasing use of AI in our everyday lives may explain why educational AI has recently received more funding for research and development (Malik et al., 2019). Some countries have passed laws requiring intelligent education, while others are looking into ways AI could improve teaching. This research examines how various AI components could improve classroom instruction (Liua Y. et al., 2021). Everyone acts based on their aspirations for the future. Since it must transpire, we have yet to determine the future. Our current knowledge lets us shape our futures. One must be well-versed in the present and history to predict the future. To weigh the benefits and drawbacks of AI, you must be familiar with its definition and potential future applications. However, new social shifts AI brings could create additional challenges for schools, even when AI can revolutionize teaching. It may make getting a job easier, tighten college admissions, or reduce the skills gap. AI can transform classroom evaluation, providing valuable insights into student learning. Innovations in technology have had a positive impact on the educational system. A system like this can significantly alter how educators perform their duties, potentially imposing technical specifications on children before they lose their autonomy. Implementing AI in the classroom allegedly profoundly affects

pedagogy, student involvement, the physical campus environment, and course material (Karsenti, 2019). Everything is easily accessible. We should prioritize using AI in the classroom and teacher training and development. This is quite complicated, contrary to what you may have heard. Any endeavour that aspires to reshape the educational landscape through sweeping, eye-catching, and immediately apparent modifications to our study and teaching methods is bound to fail—AI in the classroom, assisting educators and students in modern, fully inclusive classroom settings.

The belief that AI would drastically alter the way schools function remains, perhaps, precariously balanced. Schools will AI will provide schools with intelligent instructional resources and foster innovative approaches to education administration and assessment. , novel approaches to education will emerge. Guo and Xiao (2019) argue that educators may make a difference in education by being receptive to new ideas, integrating AI into their lessons, supporting the broad adoption of technology, and creating creative solutions to long-standing issues. We must re-evaluate and reform our educational practices to build the information superhighway without geographical and temporal restrictions. According to a study by Zhang, Zhang, and Li (2019), teachers are likelier to utilize egalitarian strategies and enhance classroom dynamics. According to Fu (2019), if this were to happen, students and professors would benefit from less administrative burden. We can quickly sift through vast information about every student's interests, abilities, and performance using AI. Machine learning algorithms may use this data to create a personalized course of study for every candidate. Adaptive learning systems adjust the lesson's tempo, material, and methodology based on each student's performance. AI has piqued the interest of many prominent politicians and scholars. Hearing about new technological advancements is expected to have a mix of excitement and nervousness. AI would help modern educational institutions automate and streamline vital procedures in an ideal world. Concerns regarding the potential future effects of AI on schools have taken precedence over the present issues. Therefore, academics studying the impact of AI on educational institutions should collaborate. Several academic disciplines stand to benefit substantially from AI implementations. Regularly reviewing a form is a beneficial idea. Popular AI coaching methods use model analysis as their basis to monitor student progress and pinpoint areas of weakness (Ilkka, T, 2018). From kindergarten to higher education, the introduction of AI is affecting classrooms everywhere. A 2019 study by Hinojo-Lucena, Aznar-Daz, Cáceres-Reche, M. P., and Romero-Rodríguez found that these tactics can improve learning and help people achieve their educational goals in modern fully inclusive classroom settings.

Blended Learning and Artificial Intelligence

Integrating BL and AI could transform our teaching by making lessons more relevant, efficient, and impactful for students. BL uses AI to enhance its service to students by merging online content with traditional in-person lectures. AI systems can generate customised lesson plans and activities by analysing student preferences, performance history, and learning tendencies. Tailoring classes to fit the individual needs of each student is one approach to meeting them academically where they are. Thanks to AI, adaptive learning platforms can change the level of challenge and give students feedback based on how well they do. Due to these technological advancements, many adaptive learning techniques, like simulations, interactive modules, and quizzes, are now available to students in BL settings.Students preferred BL, which mixes online and in-person learning, according to researchers Brown et al. (2013). Many in the education sector now believe that BL represents the dominant educational paradigm. AI could sort through the massive amounts of data generated by mixed-learning environments to find patterns in students' interests and academic performance. Teachers can utilise this data to evaluate their students' development, pinpoint their strengths and areas for improvement, and try other strategies. Teachers can save time and effort with these AI tools because they will no longer have to repeat the same duties (Balfour, 2013). BL is characterised by incorporating digital tools into group work and project management. Innovative tools that enable two-way contact between teachers and students can be immensely beneficial. An instance of an AI personal assistant might be a chatbot or an automated survey tool. Teachers can

participate more actively in class discussions and answer students' queries more quickly with the help of these tools. The development and administration of instructional resources can be facilitated using AI technologies like machine learning and natural language processing. AI might help BL adapt to its broad student base by translating content into other languages, personalising textbooks to different learning methods, and suggesting relevant resources. The assessment of online and hybrid courses could be made more accessible and more automated with the help of machine learning. Among your duties will be to grade student work, point out patterns in their answers, and offer comments on their work. Due to this efficiency gain for teachers, more funding for student-centred instruction and mentoring activities will be available. Teachers can take advantage of AI-driven tools to climb the professional ladder. AI can radically alter the nature of education by helping students close the accomplishment gap in fundamental abilities and establish a foundation for sustained academic success.Zydney et al. (2019) highlighted that tech support personnel and teachers' aids could become unnecessary and expensive with the correct application of AI with BL. Hwang et al. (2015) pointed out that flipped learning could benefit from more research into better AI. BL environments integrate online and traditional learning approaches; AI can increase communication and cooperation, provide more personalised training, and decrease instructional time. Soon, all students may benefit from better learning environments thanks to new advancements in BL and AIin modern inclusive classroom settings.

Artificial Intelligence in Inclusive Education

In an inclusive classroom, no student is disadvantaged academically or socially because of their family's socioeconomic status or intelligence. This is being driven primarily by AI. AI has the potential to significantly impact how students learn by adapting pedagogy, lesson plans, and other aspects of education to meet the needs of each student. Individualised education programmes can be life-changing for children with special needs or learning difficulties. They ought to try something different if they aim to participate in class and grasp the material we cover. Explore the revolutionary possibilities of AI in the classroom with the broader goal of inclusive education in mind. A substantial amount of research has concentrated on the possible impacts of AI on AI-powered intelligent tutoring systems, advancements in assistive technologies, and personalised learning programmes (Smith et al. (2020), Johnson & Wang (2021), Brown & Jones (2019), Chen et al. (2022), and García-Saiz et al. (2021; Kim & Lee, 2022). AI-powered tools can help children develop social and emotional skills in inclusive classrooms. Children can benefit substantially from virtual mentors or chatbots powered by AI in many areas, including socialisation, coping, health, and integration. Teachers may help their students become more inclusive leaders using materials powered by AI. Professional development opportunities can be tailored to meet the needs of teachers and the results their students obtain through AI-powered platforms in the modern inclusive classroom settings.

Therefore, children from diverse backgrounds will receive the support they require. Creating classrooms that are more inclusive and equal for all pupils is one possible application of AI in inclusive education. Teachers may build a more inclusive learning environment by utilising AI talents to meet better all students' requirements, including those with disabilities. Incorporating AI into inclusive education should only be done after extensive research on privacy and ethical concerns. Curriculum developers, classroom teachers, and everyone involved in education must collaborate. It delves into the potential of AI to transform inclusive education, narrow the achievement gap, and foster more integration among students from different socioeconomic groups. The foundation of inclusive education is catering to the needs of every student, regardless of their family relationships, financial situation, cognitive or motor skills, or other personal circumstances. As part of its effort to address AI's ethical concerns and challenges in inclusive education, this study explores a wide range of topics, including data privacy, artificial discrimination, and the digital gap. Recent research provides a fresh perspective on the challenges and opportunities of AI ethics (Muller et al., 2023; UNESCO, 2022). The use of AI in classrooms has much-untapped potential. Personalised instruction that caters to each student's unique requirements, easily accessible and

flexible classroom environments, and considering different learning styles are all essential. It begins with an overview of inclusive education in its current form, including its benefits and drawbacks. Addressing these concerns and questions is vital while researching its potential role in inclusive education to ensure AI's appropriate and ethical use in classrooms. Establishing policies and laws that protect the rights and welfare of all students necessitates ongoing assessment and multidisciplinary collaboration, particularly in light of recent innovations in BL and AI used in modern, inclusive classroom settings.

Conclusion

AI has the potential to replace human teachers by offering immediate feedback and ideas to students. On a scalable and widely accessible platform, these intelligent coaching tools mimic a human teacher by spotting errors, providing personalised feedback, and tracking development over time. Teachers may find AI tools indispensable in their battle for a peaceful classroom. Platforms driven by artificial intelligence revolutionise education by automating administrative tasks such as scheduling, exam grading, and attendance tracking. With this automation, educators may devote more time to building rapport with students and presenting course material. After substantial study, we developed a method for integrating AI into inclusive education classrooms. The outcomes indicate that BL is a great way to get more future educators to use inclusive education in their classrooms. This approach can substantially improve students' academic performance from all socioeconomic levels. By adjusting to each student's specific abilities and weaknesses, adaptive AI methods can raise educational achievement. Adaptive curricula driven by AI, real-time feedback, and personalised lesson plans will soon be accessible to all students. To help inclusive education overcome geographical and economic barriers, AI might be used in various contexts beyond the typical classroom. Remote learning systems powered by artificial intelligence make high-quality education accessible to students from all walks of life, even those struggling financially. Before introducing AI into classrooms, we must seriously discuss ethics. To ensure the safety and rights of students, lawmakers, computer programmers, and educators must collaborate closely. Both teachers and students benefit from the time and effort saved by using BL strategies in the classroom. Finding out how effectively the BL course functioned in practice is crucial after hearing nothing but praise from the student teachers. It is necessary to conduct additional research on the potential of AI in inclusive schools. Developing and implementing AI technologies that match pedagogical standards and improve education overall requires teacher participation. AI may completely transform inclusive education by facilitating a more personalised, egalitarian, and inclusive learning environment. We must exercise caution while utilising AI and maintain open communication channels to design a classroom accommodating students with diverse abilities in BL and AI in inclusive classroom settings.

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