The Promises and Challenges of Artificial Intelligence for Higher Secondary Teachers: A Systematic Review of Research

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Abstract

Artificial intelligence (AI) is turning out to be more basic in numerous regions of the economy, including secondary schooling. Lately, the field of AIin Schooling Improvement has seen significant progressions. This study planned to research the utilization of AI in optional schooling for educating and learning purposes, as well as the impacts of involving AI in this unique circumstance.This study explores the educational consequences of rapidly changing technology on the processes and scope of learning and instruction.Artificial intelligence enables secondary education services to be quickly and conveniently available, both inside and outside the confines of the classroom.This research aims to explore the integration of AI into secondary teachers and assess its immediate and future repercussions on many aspects of secondary education.The difficulties in deploying artificial intelligence in these institutions were also examined.This research aims to effectively supply educators with rich information and in-depth understanding for establishing educational models, hence creating prospects for future progress.

Keywords: Artificial intelligence, secondary education, school education, technology education.

1.   Introduction

Future developments in new technologies and the processing power of evolving intelligent machines will have a significant impact on secondary education. The progress made in artificial intelligence in this domain presents fresh opportunities and difficulties for the education sector at a higher level, with the capacity to radically alter the management and internal structure of secondary education institutions.The definition of artificial intelligence has been influenced by many philosophical perspectives from the time of Aristotle, resulting in a lack of consensus on a definitive purpose.The computing capabilities of developing intelligent machines are intrinsically linked to the future of secondary education. The development of AI in this area opens up new possibilities and challenges for secondary school education. It has the potential to drastically change the administration and organizational framework of secondary schools.Education undeniably plays a substantial and

crucial function for individuals living in underdeveloped nations. Secondary education institutions are essential contributors to a nation's progress and advancement.The economic and social growth of a person is contingent upon two crucial variables, namely, knowledge and learning.Individuals with a higher level of education are more inclined to get employment in high-skilled occupations and receive better income, hence increasing their likelihood of improving their living standards.Therefore, individuals in developing countries experience significant ramifications from secondary education, as it provides them with the necessary skills and knowledge to pursue a chosen lifestyle that is both innovative and highly productive.Quality education and proficient students contribute to enhanced economic growth and overall development, especially in emerging nations.Therefore, in a growing country like India, the importance of secondary education is much more significant, and therefore, the process of learning should be streamlined.In the last several decades, there has been a widespread technological revolution in many regions of the globe.The transition from a civilization based on conventional living circumstances to a knowledge society has brought about a significant change, with creativity and invention now playing a central role in driving culture.The previous educational system was defined by direct physical interaction between professors and pupils in the classroom, with a predominant reliance on manual labor in secondary education institutions.However, significant technical advancements in the last two decades, driven mainly by the Internet, have profoundly influenced people's perception of education and employment. One notable emerging notion that has emerged in recent years is "artificial intelligence." Secondary education is well recognized as being primarily reliant on human labor and physical effort.This not only leads to an increase in the operating expenses for secondary education institutions but also results in a rise in mistakes and delays in processing. Secondary education institutions, given their labor-intensive structure, will need to allocate a significant expenditure towards recruiting and keeping instructors, as well as managing data inside their institutions.In addition to the financial losses incurred by paying the wages of highly skilled professionals, these institutes are also experiencing an increasing burden of work in managing the admission, education, and achievement of all their students.Therefore, as a profession that is highly dependent on labor, it is experiencing significant financial and physical setbacks.Therefore, the use of artificial intelligence will result in a more cost-effective and efficient approach to the secondary education sector.

2.   Understanding Artificial Intelligence

We give a fundamental definition of artificial intelligence that was created from a literature analysis of earlier formulations in this subject area in order to explore the effect of artificial intelligence on the teaching and learning that occurs in secondary school. AI may be characterized as automated systems that are capable of participating in human-like processes such as learning, adapting, synthesizing, self-correcting, and employing data for sophisticated processing tasks. Examples of these processes include learning, adapting, synthesis, and self-correcting.Artificial intelligence refers to the replication of human cognitive processes, such as speech and visual recognition, language translation, and virtual decision-making, by computers and robots.The ability of machines to emulate human thinking and behavior has given artificial intelligence an exceptional position across all domains.Artificial intelligence is present in several aspects of our lives, ranging from intelligent sensors to personal

assistants.The secondary education industry has seen significant transformations due to recent advancements in AI. "Artificial intelligence enhances the educational experience for both students and teachers." The term "artificial intelligence" (AI) refers to the capacity of computer systems or other technologies that are based on information technology to execute jobs that typically need the intellect and logical thinking of humans, as well as their further development in this area. Although artificial intelligence has the ability to make the world a better place, it also comes with its own unique set of obstacles. Take, for instance, the case of self-driving cars. The arrival of driverless automobiles ushers in an exciting new age of technical innovation in the transportation sector.It provides significant benefits to both the automotive industry and the customers, both in terms of financial and practical aspects.Driverless cars offer drivers freedom from the typical task of driving and reduce accident rates, such as those caused by driver fatigue.In the near future, autonomous cars will replace taxis, trucks, and Uber drivers.The rapid advancement of artificial intelligence is now having a substantial influence on the nature of services in secondary education.

3.   The role of artificial intelligence in education

Multiple research studies illustrate the significance of artificial intelligence in secondary education since it enables teachers and students to adopt more adaptable learning approaches that are not constrained by limitations.Artificial intelligence is facilitating a rise in student enrollment at schools and colleges worldwide by enhancing flexibility and expediting processes.Nevertheless, the use of this teaching method has been shown to be rather costly. However, when compared to other expenses associated with physical labor, it is considered to be cost-effective.Utilizing artificial intelligence in the long term is much more economical for students compared to conventional teaching methods and manual work.The technique of artificial intelligence has been effectively adopted in developed nations worldwide.Nevertheless, underdeveloped nations are still in the early stages of using artificial intelligence, in contrast to industrialized countries.Developing nations have several hurdles when attempting to apply artificial intelligence as a tool in secondary education, including weak infrastructure, limited information access, inadequate institutional support, insufficient essential resources, and low technical capabilities.Artificial intelligence (AI) is used in the education system to automate the grading process. Through this method, instructors may automate the evaluation of students' responses to a predetermined set of questions.AI may be used in adaptive and personalized learning to meet the specific needs of pupils.Artificial intelligence aids teachers in assessing students' comprehension of their lectures and enables them to provide suitable guidance to pupils.It functions as an instructor for the pupils, facilitating their comprehension of subjects with ease.Projects powered by artificial intelligence provide valuable assistance to both students and instructors.It compels teachers to assess the accomplishments of their pupils and encourages them to improve the guidance they provide. The introduction of AI frameworks into educational settings has significantly altered the ways in which students learn about and interact with various forms of integrated technology. Giving students opportunities to engage in experiential learning has the potential to convert teachers into facilitators. Students are able to improve their learning and make more progress by using the experimental approach, which is made possible by artificial

intelligence (AI), which gives assistance and removes any anxiety that may arise. Finding students, teaching them, and helping them succeed will be very different in the future, thanks to the capture of data via the use of AI frameworks.Indeed, under some circumstances, technology may even replace instructors in specific locations.It has transformed into an educational companion that assists pupils in their learning process.

4.   Objectives of the Study

4.1 To study and understand the present scenario of artificial intelligence and its correlation with secondary education.

4.2 To explore and foster the relationship between artificial intelligence and secondary education with reference to the student's learning.

4.3 To assess and discuss the promises and challenges of implementing artificial intelligence in secondary education.

5.   Methods and Materials

This research performed a survey at many teaching institutions in Hyderabad, Telangana State. Dozens of instructors and students from various growth stages, kinds, sizes, and majors were chosen as interview samples based on the primary criteria of evaluating the quality of classroom teaching, including teachers' teaching proficiency and classroom teaching design. The respondents provided information on the fundamental aspects of instructors, such as their age, educational background, topic expertise, teaching experience, and participation in teacher training programs.

200 surveys were distributed, and 180 valid questionnaires were collected. The findings were deemed to be genuine. It incorporates the new teachers' comprehension of the concept of classroom teaching objectives, as well as their attitude on the formulation of classroom teaching goals and their point of view on the presentation of classroom teaching goals. The collection of all the empirical data sources required for this study is now complete. The perspectives of university lecturers and students about the use of artificial intelligence are outlined in Table 1.

Table 1: Perspectives of teachers and students on AI

Teacher	Understanding of AI teaching	AI-oriented teaching	AI reducing workload	Intelligent teaching is good
	22%	54%	48%	67%
Student	Understanding of AI teaching	AI-oriented teaching	AI reducing workload	Intelligent teaching is good
	22%	64%	14%	86%

5.1 Empirical Methodology

In the first place, the study field uses content analysis, which is an important method. This is an essential technique. The representative samples were obtained by collection and measurement according to a variety of factors, and the trend was evaluated through the use of relevant statistical methods. Concurrently, it looks at the techniques used for identification in literature, the prevalent artificial circumstances, as well as the spread of literature in the area of artificial computer literature. In addition to this, it conducts statistical research on the methodologies, jobs, educational systems, and application systems, as well as their respective duties, in the domain of education data mining. In addition, a specialized questionnaire on artificial intelligence (AI) and the specialization of secondary vocational instructors was developed as part of this study in order to get a more in-depth knowledge of the instructors' understanding of and use of AI. The purpose of this exercise was to assess the teachers' level of expertise in educational information technology and to give them more useful ideas and strategies for their further professional growth.

The purpose of this investigation is not to provide a comprehensive overview of the many aspects of artificial intelligence research being conducted in the field of education. The objectives and concerns of the inquiry are the primary foci of this study. In order to provide an illustration of the issues, it selects certain cases that meet a set of predetermined criteria. The formerly disconnected, unchangeable, and distinct information is made to seem more unified as a result of this strategy's use. It is feasible to carefully identify the potential issues that may arise from a variety of perspectives if one has a thorough grasp of the fundamental features of artificial intelligence research in the area of education. The assessment of sample papers is taken into consideration in order to appreciate the major concerns in the area of artificial intelligence and educational research. This is done in order to pick acceptable coding samples. When it comes to academic study, inferior literature often does not meet the standards of scholarly rigor, which creates a number of obstacles and makes it more difficult to comprehend important topics.
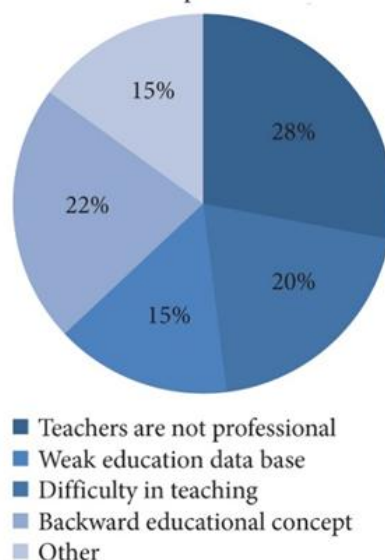
Furthermore, the use of deductive reasoning. When examining some research issues that are subject to rapid shifts, it may be difficult to create exact judgments using traditional data from previous research approaches. In addition, the results that are predicted often show a lag in proportion to the progress that is being made in these fields of research, as can be plainly observed in the field of artificial intelligence. For this reason, it is absolutely necessary to make use of logical inference and rational thinking that is founded on objective data in order to prospectively analyze and forecast the future course of the industry that is rapidly advancing. In order to demonstrate the thoroughness of our study, one of our goals is to forecast the future course of the online education sector using deductive reasoning in a manner that is both complete and accurate.

6.   Challenges in the Progression of Secondary Education

6.1   The lecturers demonstrate a lack of professionalism and possess a poor understanding of topics. Artificial intelligence education has the ability to provide ideas and meanings to students in an intuitive and complete manner. Teachers at many secondary education

institutions often face the obstacle of restricted practical application views within the realm of science and technology. As a consequence, they are obligated to concentrate only on elucidating ideas and meanings, leading to a tedious instructional method. Nevertheless, these educators are acutely aware of the significance and practicality of integrating artificial intelligence technology into their teaching methods. They were not skilled in the forms of working together with artificial intelligence in the realm of education. Throughout the teaching process, students' independence is greatly enhanced, but educators may quickly lose sight of their own responsibilities if they fail to modify their instructional methods. Artificial intelligence sets itself apart from other fields. There is a significant association between it and social growth. Both the rate of progress and the diversity of options within the major are increasing. The poor public opinion will have a negative influence on the teachers' extensive understanding and competence. The use of artificial intelligence technology in modern education has the capacity to replace repetitive tasks, but it falls short of successfully offering emotional support to students and nurturing the cultivation of values. Figure 1 illustrates the existence of several issues that need attention in the progress of secondary education.

Figure 1: Problems in the development of education

6.2 Educating artificial intelligence technology is a formidable task owing to the vast range of intricate professional connections involved. In the field of secondary education, many sectors, schools, and disciplines have unique knowledge systems and practical applications. It is not feasible to make generalizations due to the variations in teaching techniques used by each teacher and the learning methods utilized by each student. Therefore, in order to tackle the complexities of the education system, it is essential to include artificial intelligence technologies in diverse settings. This will improve the capacity to adjust and get a thorough comprehension of the constraints of technological advancement and the difficulties in efficiently applying it in the school system. The use of emotional computing technology in artificial intelligence might potentially address these problems. This technology enables the AI system to understand and transmit both written and spoken information. The field of artificial intelligence is making continuous

development in speech and text applications. However, more improvements are required in the state's natural language processing and emotional computing, which may be achieved via the efforts of educators. Figure 2 illustrates the use of educational information technology by teachers.
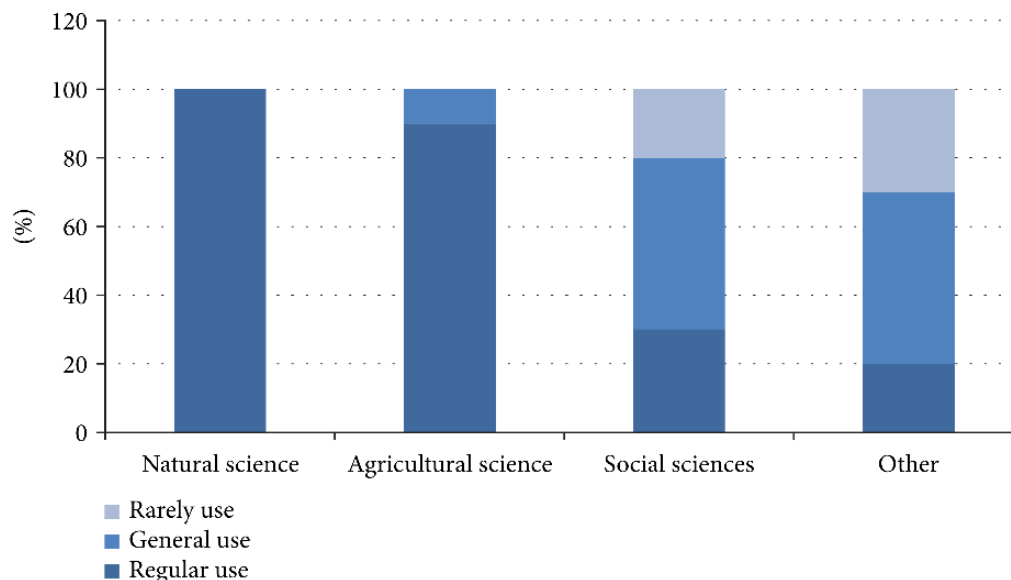
Figure 2: Utilization of educational information technology by educators.

6.3   The school database isn't complete, and there isn't much value in using technology. Artificial intelligence (AI) is being used more and more in many areas, which has led to its integration into other areas. On the other hand, a lot of high-quality data is very important for artificial intelligence to work well. Artificial intelligence needs to keep an eye on and record information about how teachers teach and how well their students are learning so that any problems can be found and fixed. Right now, there isn't enough unity in the data standards used in education, and this poor collection makes it much harder to apply them together. The fact that there are many data forms, like hypermedia, used in education and training lowers the quality of the data. Because of this, it is harder to use personalized education services and accurate AI systems on a large scale.

7.   Addressing Artificial Intelligence's Advancement in Secondary Education

7.1   Make regular adjustments to the curriculum and raise the general public's awareness. It is vital to guarantee that educators and learners possess accurate understanding and practical experience, especially considering the rapidly advancing fields of science and technology. This includes the many applications of artificial intelligence technology in contemporary secondary education. Students will be crucial in the field of education because of the growing usage of online learning and the presence of big data. In addition to modifying their methods of instruction, teachers should always work to enhance their teaching abilities. Students' capacity to engage in customized, adaptable, and in-depth learning should be fostered. Furthermore, teachers need to be quite knowledgeable about the fundamental ideas behind theoretical frameworks. This will broaden their

professional knowledge and views by making it easier for them to adapt to new sectors and areas that could emerge in society in the future.

7.2 Intensify the investigation and creation of artificial intelligence-related teaching materials and improve technical services. Internet companies and IT groups should look closely at real-world scenarios and identify the intersection of market needs and existing education. Research and development initiatives should be undertaken with the goal of creating intelligent educational products. Promoting the valuable use of technological solutions and enhancing the study, creation, upgrading, and application of these goods should also be priorities. Expanding the functional features of educational AI products at the same time is crucial to improving learning outcomes, supporting teaching and learning, and catering to the individual needs of teachers and students. Furthermore, laws, regulations, and standards have been put in place to ensure that intelligent tech companies can provide better and safer products and services for modern schooling.

7.3 Establish specialized curricula in artificial intelligence for schools and colleges. To become the best in the area of artificial intelligence in the current environment, people with high levels of knowledge must be developed. Rich nations' secondary education institutions have started to place a strong emphasis on artificial intelligence education and training by developing specialized curricula for this purpose. Osaka University and Waseda University in Japan have developed academic programs focused on robots, artificial intelligence, and other fields of information engineering. Oxford University in Britain offers postgraduate studies in advanced subjects, including memory networks, intelligent systems, and other related technologies, in addition to machine learning undergraduate education. In the United States, the computer science department at Stanford University offers a broad curriculum, including topics such as robotics, data analysis, artificial intelligence, agent systems, and natural language processing. The basis for training people in the area of artificial intelligence is provided by the artificial intelligence course. Secondary education's own teaching methodologies are directly linked to its progress.

8.   AI-Orinted Learning for Students

The use of Artificial Intelligence (AI) in school education has the capacity to transform the methods of student learning and teacher instruction.AI algorithms have the capability to provide pupils with individualized feedback and suggestions, resulting in a more captivating and efficient learning process.Notwithstanding the apparent advantages, there are still several obstacles linked to integrating AI into the educational setting.

Artificial Intelligence is gaining significance in our everyday lives and has the capacity to transform our work, communication, and learning methods.AI has the potential to enhance education by offering students a tailored and captivating learning experience while also enabling instructors to better cater to the individual requirements of each student.Although

there are potential advantages, integrating AI into school education also presents several obstacles, such as the need for technical proficiency, scarcity of resources, and ethical considerations. AI technologies may enhance students' learning abilities in three distinct ways:

8.1 AI-guided Learning: An AI-powered machine may be equipped with pre-existing expertise, similar to how a teacher contributes past knowledge to school education. This AI system may transfer information to the learner in a similar manner as a teacher in a school. An authentic educator may administer specific educational tasks and assess the student's mastery of the prescribed learning objectives. In AI-directed learning, the AI-powered computer acts as a teacher and guides the student along a planned learning path to achieve particular learning objectives. This technology may serve as an instructor to the learner for independent study outside of regular class hours. This teaching-learning approach is referred to as AI-directed learning, in which the student assumes a passive role as a receiver of information and adheres to a planned learning route. If AI-driven education becomes popular, the need for in-home instructors may diminish. Merely replicating a tutor's actions with AI technology fails to fully harness the capabilities of AI. There are more effective methods of using artificial intelligence to enhance the process of learning.

8.2 AI-supported learning refers to an enhanced kind of machine-assisted education where students work together with an AI system. During AI-supported learning, the computer consistently gathers data from the learner via their interactions. Subsequently, this data is used as iterative feedback to fine-tune the learning process since the AI machine is capable of approximating the student's advancement. The AI system facilitates an iterative process in which it dynamically instructs the learner to enhance the learning experience. In this context, the primary emphasis is placed on the student as the central figure in the process of acquiring knowledge. The student's performance prompts the AI engine to adjust the difficulty level, resulting in an optimal individualized learning experience for the learner. Both students and AI computers are engaging in collaboration.

8.3 AI-enhanced Learning: The intriguing component of AI-enhanced Education is the presence of several participants, including students and instructors. A multitude of students interact in order to tackle intricate difficulties. The instructors provide constructive criticism and guidance, creating an enhanced teaching and learning environment. Given the collaborative nature of the task, learners must develop proficient communication skills and demonstrate creativity.

8.4 AI will unquestionably remain a crucial element in education as new AI applications are swiftly being created to provide tailored and individualized learning. Introducing AI in Education yields both immediate and enduring advantages. Nevertheless, as educators, we must also contemplate that the objective of education is not to augment human

agency, which is the ability to meditate, scrutinize, and engage in deliberate action. Only this capability can enable pupils to manage their lives with success. Hence, the ethical dimension of AI in Education is a matter that should not be underestimated as we embark on integrating AI into the field of education.

8.5 Education extends well beyond the essential accumulation of information and the ability to retrieve facts or the provision of concise and concise responses. Consequently, AI computers are most effective when used as teaching assistants or tutors rather than professors.

8.6 Given that AI robots gather data from students on their learning progress, the methods and safeguards used for data collection and protection might likewise raise apprehension among students and educators. Outside of the field of education, we have seen the increasing prominence of privacy concerns and ethical considerations around data use. AI robots operate based on models and data, which are fundamentally determined by AI professionals. The prejudices and perspectives of individuals may influence the manner in which AI robots engage with users in the field of education, hence impacting their learning experiences. The genuine educator may assume the role of a silent observer while AI technologies determine the trajectory of pupils' learning and their future prospects. It is essential to develop appropriate policies and create new strategies at the institutional and government levels in order to differentiate between possibilities and problems and reduce the dangers that AI poses to education.

Table 1: The Five Schools of Thought on Artificial Intelligence

The Dystopians	The dystopian ideology posits that a conflict of survival will ensue between humans and robots, ultimately resulting in the triumph of the brilliant machines.The dystopiansessentially see the adverse ramifications of AI and automation.They predict that robots would assume the repetitive duties that are tedious for humans and need less intellect.Conversely, the AI will possess the capability to do tasks that need advanced cognitive abilities. This is likely to lead to significant employment reduction in the education sector and, in the long run, reduced salaries.
The Utopians	In contrast to the dystopian, the utopians have a tendency to see the beneficial aspects of the influence of artificial intelligence.They claim that mankind is entering a transformative and auspicious period characterized by reduced labor hours and an elevated level of living.In many instances, intelligent machines will surpass people in doing cognitive tasks, while robots will excel in carrying out physical labor.In order to mitigate the adverse effects on employment resulting from displacement, individuals must prioritize expenditures in education in conjunction with technology.
Individuals with a	This ideology anticipates a favorable impact of technology on production.The economy has already seen an increase in productivity

positive outlook	since the advent of the digital era, but enterprises are still in the process of understanding how intelligent technology might be beneficial.Unleashing the full potential of the technology will lead to even higher levels of production.
The Skeptics	Their assertion is that the increase in productivity will not lead to a rise in profits or national GDPs, particularly in the context of aging populations and economic disparity.The skeptics argue that an increase in turnover does not always translate into an increase in profit.Additionally, they are advocating for increased clarity since they hold the belief that the anticipated level of productivity growth will not be met. This may potentially result in an economy that remains static or even experiences a decline in comparison to the investments made in artificial intelligence.
The group known as The Realists	The realist perspective maintains a positive outlook while simultaneously emphasizing the need to be realistic.Indications of increased productivity are evident, and organizations that implement an artificial intelligence (AI) adoption plan in their operations will see substantial and swift improvements in productivity.Consequently, the creation of new employment opportunities will occur, but there will be a decline in middle-skill job positions while low-skill and high-skill positions will see growth.Education will be crucial in developing innovative and efficient methods to modify training programs for emerging employment roles, as well as providing opportunities for individuals to enhance their skills in response to technological advancements.

9.   Advantages of Integrating Artificial Intelligence into the Schools

9.1 An essential advantage of integrating AI into the classroom is the capacity to provide pupils with a highly individualized learning experience. Artificial intelligence algorithms have the capability to examine student data and adjust their approach to match the unique learning styles of each student. This enables them to provide personalized feedback and suggestions that cater to the specific requirements and capabilities of the individual. Implementing this strategy may effectively enhance student engagement and motivation, ultimately resulting in improved academic achievement.

9.2 Integrating AI into the classroom has the advantage of enhancing students' comprehension of this swiftly advancing technology. By integrating artificial intelligence (AI) into the educational curriculum, educators may assist students in cultivating a discerning viewpoint about this technology, therefore equipping them to navigate the complexities and possibilities of the digital era. Integrating AI into the classroom may facilitate the cultivation of crucial 21st-century competencies, like problem-solving, critical thinking, and teamwork, among students. Proficiency in these abilities is essential for achieving success in the era of digital technology, and they may be cultivated by actively engaging with artificial intelligence tools and apps.

9.3 Teaching aides: The capacity of AI to engage in human-like conversations presents opportunities for adaptive tutoring or instructional assistants that may aid in elucidating complex topics to pupils. AI-powered feedback systems have the capability to provide valuable assessments on student writing, helping students refine their writing abilities. Additionally, specific types of prompts have been shown to assist youngsters in generating more productive inquiries regarding their learning. AI models may also facilitate personalized learning for kids with impairments and provide translation services for those learning the English language.

9.4 Instructional aides: AI has the potential to address some administrative activities that prevent instructors from dedicating more time to their colleagues or pupils. Initial applications included the automation of mundane chores such as formulating lesson plans, generating tailored resources, constructing worksheets, devising quizzes, and investigating methods for elucidating intricate academic content. AI may provide educators with suggestions to address student requirements and assist instructors in reflecting, strategizing, and enhancing their teaching methods.

9.5 Parent aides: AI may be used by parents to write letters for seeking individualized education plan (IEP) services or to request an evaluation for gifted and talented programs for their kids. Parents seeking a school for their kids might use AI as an administrative aide. This AI would help in identifying schools located within a reasonable driving distance from home, creating schedules for submitting applications, organizing contact details, and other similar tasks. Generative AI has the capability to generate bedtime tales that have developing narratives specifically customized to suit a child's preferences.

9.6 Administrative assistants: School administrators may use generative AI to compose a range of messages, such as materials for parents, newsletters, and other community engagement papers. AI systems may assist in the challenging duties of arranging class or transportation timetables, and they can analyze intricate data to detect patterns or requirements. ChatGPT is capable of doing advanced sentiment analysis, which may be valuable for assessing school atmosphere and other survey data.

10. Challenges in AI-Oriented Teaching

Although there are several advantages to integrating AI into the educational setting, instructors must also confront certain obstacles.A significant obstacle is the need for specialized technical knowledge.Teachers lacking familiarity with AI may encounter challenges when incorporating this technology into their instructional methods, necessitating assistance and training to begin the process.Yet another obstacle is the financial implications associated with AI tools and applications.Several educational institutions lack the necessary resources to acquire and sustain the technology required for integrating AI into their classrooms. Consequently, they may have to explore options such as seeking external financing or establishing partnerships to support their initiatives.Moreover, the integration of

AI into the classroom raises significant ethical considerations.With the increasing sophistication of AI, there are apprehensions over its implications for privacy, security, and the labor market.Teachers should be aware of these risks and make efforts to safeguard their kids as they delve into this captivating and swiftly advancing technology.

10.1 Insufficient integration of AI technology into educational practices: Emerging AI technologies aim to provide instructional support, such as via the use of chatbots and robots, and to provide instructors with valuable information to enhance their decision-making in teaching, such as learning analytics. Nevertheless, this analysis suggests that instructors may lack a comprehensive comprehension of the technologies needed to use them effectively. Teachers may have challenges in interpreting learning analytics, have little knowledge of the capabilities of AI technology in education, and experience uncertainty on the pedagogical implications of employing AI to educate pupils. For instance, should chatbots be used for student discourse before or after an instructional session? Hence, it is essential for future studies to explore the specific functions and responsibilities of educators within pedagogical frameworks enhanced by artificial intelligence.

10.2 Insufficient integration of multidisciplinary AI technologies in learning: Due to the complexity of the learning process, AI technologies designed for specific disciplines may not be universally successful for all students. AI encompasses several sub-fields, including natural language processing, computer vision, and neural networks. However, the AI approaches used in education are often straightforward and designed for specific tasks. AI technologies are not advancing as quickly in the field of education compared to other areas. Teachers often use pre-existing technology for the goal of education, which may not always be the most appropriate for their specific needs. Hence, it is essential for academics to strive towards creating multidisciplinary tools by harnessing cutting-edge AI technology.

10.3 Exacerbating educational inequality in access to digital resources: The majority of the examined research on AI in Education emphasized that AI technologies have the potential to enhance student motivation and cultivate skills relevant to the 21st century. Nevertheless, the advantages primarily benefitted the most proficient and driven pupils. There are two practical supports for this revelation: (i) AI advancements are deficiently arranged and produced for understudy learning, and (ii) Educators need academic mastery in carrying out these advancements. Understudies needing further help might have encountered a decline in inspiration because of the utilization of AI advances, as they had difficulties in really speaking with the simulated intelligence specialists and considered the recommended learning materials unsatisfactory. The presentation or reconciliation of AIEd might fuel the computerized hole and compound instructive unfairness. Future exploration ought to focus on two fundamental regions: (i) The improvement of a clever educational structure for artificial intelligence learning and educating and (ii) the utilization of a learning sciences approach in the creation and refinement of calculations for individualized learning.

10.4 Inadequate familiarity with AI technologies among teachers: The majority of teachers possess a limited comprehension of the functioning of AI technologies, such as the principles or algorithms used for suggesting resources, resulting in their reliance on a mysterious and incomprehensible system. Consequently, they lack the ability to respond to student inquiries on AIEd, such as explaining the rationale behind the AI platforms' recommendations for specific learning materials. Additionally, they are unable to fully exploit these technologies for educational purposes, including learning, teaching, and assessment. Hence, it is essential to acknowledge the need for educators to possess expertise in artificial intelligence (AI) and its use in teaching methods, which should be taken into account in future studies.

10.5 Pessimistic perceptions about AI among students and teachers: Several kids and instructors have expressed experiencing anxiety and reduced self-assurance when engaging with AI technology. Students may have concerns about their future prospects since the advancement of AI technology has the potential to render their desired professions obsolete. Conversely, instructors' limited understanding of the systems might result in low self-confidence in their abilities. The presence of uncertainty may lead to unfavorable views toward AIEd, which in turn impacts the willingness to use AI for educational purposes. Further research is required to investigate the use of Artificial Intelligence in Education (AIEd) for students in non-engineering fields, such as K–12 and art students. Additionally, there is a need to study the professional development of teachers in relation to AI issues.

10.6 There is a limited amount of research on the socio-emotional components of AIEd. Most studies in this field have focused on cognitive results and adaptive learning, while only a few have investigated socio-emotional outcomes. The literature has documented the risks and negative consequences associated with AI in education. Besides, the two understudies and educators know about the moral issues encompassing artificial intelligence in training. The ethical ramifications of involving man-made intelligence in regulation, design, and sociology have been broadly pondered, but the same level of scrutiny has not been applied to its use in education. Further investigation into the ethical concerns associated with AIEd is therefore required.

10.7 This study aims to include a broader range of educational research viewpoints in the field of AIEd, addressing the current lack of such perspectives. Be that as it may, most AIEd scientists have a robust design foundation, driving them to focus on innovation plans and improvement and utilize a design methodology in their AIEd study. This method does not adequately include the viewpoints of educational scholars and instructors. Given that AI is a field that involves several disciplines, it is essential for future studies to explore novel methodologies for interdisciplinary studies in the field of AI in Education. These methodologies should aim to actively include teachers, students, and educational researchers.

10.8 Inadequate assessment techniques of AIEd: The prevailing evaluation methods used in AIEd research may lack effectiveness. The majority of the examined study used established methodologies to assess innovative technologies that utilize large data, such as extensive student datasets and data that is inadequately organized. Teachers and students have expressed confusion and discouragement over the AI-enabled systems that are considered the most successful in evaluating engineering-focused curricula. Hence, the field of AIEd must develop novel approaches to assess the efficacy of AI technologies.

11.   Opportunities of Implementing AI in Teaching

11.1 The use of AI in education will provide many educational prospects, and institutions that allocate the required resources to leverage it will attain substantial advantages. The use of technology or teaching bots in education is becoming a more appealing remedy as student enrollment rises and class sizes and personnel expenses increase. Nevertheless, it soon became evident that one of the issues would hinder the implementation of the deal. However, HEI has the capability to use Artificial Intelligence (AI) for institutional objectives.

11.2 The use of AI in education is becoming prevalent and may provide valuable assistance to students. Specific applications assist students in automatically organizing their class schedules. Additional sources, such as guidance counselors or career services offices, provide recommendations for courses, majors, and career trajectories. AI can assist students in the realm of financial assistance. AI may be used by secondary education institutions for educational purposes. They are developing technologies that adjust to the speed and advancement of users. Artificial intelligence (AI) has the capability to autonomously assist users in customizing various routes or provide feedback by analyzing their mistakes. Learning science researchers might use this data to ascertain the most effective pedagogical methods, courses, or interventions for specific pupils. Students from many countries and time zones convene globally, each progressing at their own individual learning speed. To successfully complete the course, one must make significant advancements in many perspectives and fundamental abilities.

11.3 Students have the ability to personalize their educational paths by using adaptive learning technologies. Several colleges share the belief that AI has the capacity to enable adaptive learning and enhance student achievement. Although this technology is extensively used, the majority of individuals do not incorporate it into their everyday routines due to its limited integration. Simultaneously, education is still in its nascent stages. The majority of sophisticated approaches establish a learning trajectory via student-system interactions. Once the necessary technologies are implemented, they may assess and react to students' development in real time, using their actual actions, analytical learning data, and machine learning. Consequently, they are able to assist every student by providing scaffolding to facilitate comprehension of novel topics and

promote their academic achievement. This feature offers the necessary tools and data to send feedback on the student's progress in an asynchronous manner.

12. Suggestions

Implementing optimal strategies for integrating AI into the classroom may assist educators in efficiently adopting this technology into their instructional methods, therefore offering students a highly individualized and captivating learning experience.Here are some essential guidelines to keep in mind:

12.1 Collaborate with a trustworthy AI provider- It is essential to locate a dependable and reliable AI collaborator in order to effectively incorporate AI into the educational setting. It might be a technological firm, a nearby institution, or a non-profit group that focuses on providing AI instruction. An appropriate partner may provide assistance, education, and direction to assist educators in successfully integrating AI into their instructional methods.

12.2 Begin with a small scale or scope- Instead of attempting to integrate artificial intelligence (AI) across the whole curriculum, it is advisable for instructors to begin with smaller-scale initiatives and gradually expand their efforts. By engaging in this process, instructors might acquire proficiency in utilizing the technology, enhance their self-assurance, and progressively improve their instructional methodologies. Teachers might begin by integrating AI-driven educational games into their courses or use AI algorithms to provide students with tailored feedback on their tasks.

12.3 Promote the development of ethical and analytical thinking skills- Integrating AI into the classroom offers students the chance to develop a discerning viewpoint on this technology and its societal ramifications. Teachers must promote pupils' critical thinking skills about the ethical ramifications of AI and prompt them to contemplate the probable repercussions of its extensive adoption. This may facilitate the development of conscientious and knowledgeable digital citizens among students, enabling them to effectively traverse the complexities and advantages of the digital era.

13. Conclusion

The domain of school education has existed within a pretty recognizable framework throughout the course of centuries.With the fast progress of AI technology, schools are now compelled to thoroughly reassess their current educational paradigms.Each year, new e-learning platforms using artificial intelligence (AI) are introduced, while existing platforms continue to advance rapidly.The AI industry is seeing substantial financial expenditures and attracting several scientific contributors.This movement is yielding remarkable outcomes already: teaching assistants who seem to outperform their human counterparts and automation of administrative duties such as grading exams, analyzing essays, reviewing admission applications, or estimating the likelihood of a student dropping out.

We recognize that each new technology has some advantages as well as significant hazards.Hence, it is crucial to establish an ethical framework to differentiate the AI capabilities, ensuring its utilization for the advancement of the education system.Many professional groups and policymakers have devoted considerable thought to these concerns over the course of many years, resulting in the development of standards, certification programs, and recommendations.

To summarize, integrating Artificial Intelligence into the classroom offers a distinct prospect for both educators and learners.Artificial intelligence (AI) has the capacity to provide students with individualized and captivating learning encounters while also aiding in the cultivation of crucial 21st-century competencies such as analytical reasoning and solution-oriented thinking.Nevertheless, the incorporation of technology in educational settings brings out other obstacles, including concerns over data privacy and ethical considerations, the need for continuous training and assistance, and the possibility of uneven availability of technology and digital competencies.

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