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# **Examining the Application of Artificial Intelligence (AI) in the Classroom for Effective Teaching and Learning**

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## **Abstract**

Artificial Intelligence and machine learning innovations can be used to examine teacher and student learning. Examples of AI methods in education include out grading essays and creating customized student's suggestion and advancing the learning resources. AI ideas are added to help learning can be divided informally up to three categories. Teacher, scholarship and Guidance. These groups are general and it does not necessarily exclusive, but framework is provided for development of an organization. Previous methods of AI has been looked at by the paper which shows how AI improve the learning and group them to assist in the new improvement to AI applications in teaching and learning. The current economy is most likely relied based on education powered by AI especially in the higher education. Labor – intensive task and knowledge gap can easily achieve through the help of AI. In addition, the researcher also looks drawbacks potentially which include consideration on ethical issues using learning information to power AI. By analyzing the previous use of AI in education this research intends to categories the framework to improve understanding of the area of AI and bring rapid development needed by the developing countries.

**Keywords:** Artificial Intelligence, Teaching, Learning

## **Introduction**

Artificial intelligence (AI) is the intelligence that machines, not people or other creatures, display. The domain in which the study of intelligent device's, or those that sense their surroundings and take steps to increase their chances of success, is what artificial intelligent (AI) research to. as stated by john M.C (2000).

Artificial intelligence (AI) is the science and Engineering of making intelligent machines, especially intelligent computer program:

## **A Brief Overview of AI's Early History**

Computer sciences artificial intelligent (AI) subfield seek to provide positive answer to Turing's question. it is our attempter to transfer or replicate human intelligent in robots. The basic purpose and concept of artificial intelligence were defined by Alan, T in 50. The cutting edge technology known as artificial intelligent (ai) is being used extensively in many different industries. Developed to converse using human language, large language models (LLM) are on emerging subset of AI technology. Fundamentally LLMs are taught using a plethora of data that is taken from the internet, including text and graphic content. They are becoming a more common presentation tool, especially in scientific writing, because of their capacity to produce expert, human like content in nearly any field.

## **Impact of artificial intelligence (AI) on academic pursuit**

Academic writing has change in a number of ways due to artificial intelligence (AI) which present a number of an advantages and opportunities. These are a few notable effects of AI on scholarly writing.

1. Research support: AI powered technologies assist with data analysis, literature reviews, and source identification.
2. Writing Tips: Grammar, syntax and style suggestions are provided by AI driven writing aides to enhance the caliber of written work.
3. AI is capable of producing summaries, outlines, and even whole drafts of content, which can save time and effort.
4. Editing and proofreading: AI powered technologies assist with syntax, grammar, and punctuation adjustment, guaranteeing error free writing.
5. AI powered technologies that identify plagiarism help to maintain academic integrity and originality.

### **1.1 system for recommending teachers**

An artificial intelligence system (AI) was utilized to power a teacher recommendation system for online students and teachers (chen at, al, 2021). In online one-on-one courses, recommendations systems are important for properly matching teachers and students, need to be properly matched to reduce scheduling conflicts and social tensions. Ratings and reviews from previous students can be noisy and unreliable, rendering reviews an in effective recommendation system. To improve recommendations the AI examined data from academic historians of teachers and students to predict which teachers and students had good compatibility with each other Andy's departure to recommend certain teachers to certain students. The average number of match tries decreased from 8:35 to 10:33 over the previous five months, the period is a result of the AI's enhancement of new teachers in the recommendation system. The declining patching attempt indicates that students were less likely to wish to switch teachers and that the new methods were more satisfying.

### **1.2 Identifying students who are at risk and providing assistance.**

In a research study. The pupils who were most likely to fail to get assistance were identified using an AI. (Hlosta and other. 2021). The study forecasts student's outcome using predicative learning analytics or PLA. The purpose of the forecasts is to help the teacher intervene by identifying the students who are most likely to fail. The chances of passing were higher for students who received help. According to the study, students from disadvantaged backgrounds, such as those who are poor or belong to minority groups, gain more from interventions (Hosts at al. 2021). Despite this, a larger study sample is required. It shows how AI can close educational disparities and advance inclusive education.

### **1.3 Actionable and useful criticism**

AI has also been utilized to assist students in selecting actions that will help them succeed academically. Researchers used information from the AI to create a machine learning software. Academic performance can be predicted using learning management system (LSM) (Afzael, et al, 2021). Subsequently, the forecasts were employed to automatically provide actionable feedback, including assignments or learning materials that students could evaluate to enhance their academic achievement. Using a method known as counterfactual explanations which forecast what steps, if implemented will improve the, this strategy produced feedback. AI makes the most forecasts. After then, these forecasts serve as feedback for the pupils should utilize. This facilitates self-regulation personalization of learning for students, increasing efficiency.

## **2. “Students” AI Approaches**

The term “students” educational AI refers to the integration of AI technology with educational concepts to enhance the quality of educational concept to enhance the quality of education, for example, by personalizing and streamlining instruction or increase student engagement. A few instances of “learning AI” are learning analytics home-based learning and intelligent tutoring systems. With emphasis on the student perspective, their goal is to assist students in comprehending applying, and retaining the knowledge that they are taught. It’s crucial to adhere to educational learning concept and related studies for AI to be most successful in enhancing learning.

### **2.1 ALEK’S progress checks**

ALEK’S is an online learning platform with a focus on STEM education. Students are taught “topics” and then given progress checks to gauge their level of learning. The purpose of progress checks is to see if pupils have maintained their knowledge. None the less users of ALEK’S gave learning new content precedence over reviewing previous material (Adam et al, 2021) researchers also found that students had “Assessment fatigue” and were less likely to respond to a question on a subsequent progress check (Adams et al, 2021). To make the question/topic better. In order to identify which topics were likely to be overlooked and ought to be covered in progress checks, researchers employed artificial intelligence (AI). The topic that the progress check decided to test for in the future were then optimized using these predictions to enhance learning outcome. They examined two groups of about 150,000 pupils, one in 2019 prior to the new progress checks and the other in 2020 following it. They discovered a 9% improvement in learning from 2019 to 2020 following which may be particularly noteworthy given the covid – 19 epidemic (Adams et al, 2021).

## **3.0 AI Approaches for Teachers.**

The term “teacher” AI describes AI tools that support educators in their work. In this instance, AI serves as an additional tool for teaching serving as a means of increasing teaching time by contracting out pointless work or broadening the range of techniques available to educate in a more flexible innovative teaching techniques made feasible by AI are two examples here are a few illustrative methods.

### **3.1 Essay Grading Autonomy.**

Essays are scored by automated essay scorers using AI methods. They do this by using natural language processing and machine learning to score essays without the need for human interaction. In order to identify with writings are of high quality, AI algorithms identified patterns from previous rated essays by humans. Even while an AI model may overlook

subtleties and context and is unreliable to fully comprehend why an essay is good or terrible, it may anticipate right grades based on statistical patterns seen in essays with better scores in the past. Also auto graders of essays can further be upgraded with the help of response theory items to average different immediate essay scorers (Aomi et al. 2021). With the help of essay auto grader there will be a time reduction that was normally used using grading manually.

#### **4. Why Grouping is Beneficial.**

Care costs AI techniques in education can support development that is both secure and productive within the framework of the recommended groupings, “Students,” “Teacher,” and “Guidance,” artificial intelligence in education “Student” refers to methods that facilitate learning “Guidance” refers to methods that assist in academic management and “Teacher” refers to methods that assist the instructor in instructing. These organizations can help to improve education by offering a framework for comprehending the applications of AI approaches in the classroom which can help advance the field.

#### **4.1 Specific Development.**

The first benefit of classifying AI applications in education is that it makes it possible to apply generalizations to various AI methodologies AI techniques to enhancing student learning abilities for instance, should be based on cognitive science or educational research since “Students” and the teaching “AI approaches are closely related to education. Given that “guidance” AI is more closely association with management and can do tasks like study advice or adaptive scheduling it may be easier to draw conclusion from management research. The trans disciplinary nature of AI in education make it possible for several sectors to work together when AI approaches are combined.

#### **5. A Disadvantage of Using AI in Education.**

While artificial intelligence (AI) holds great promise for enhancing education its safe and effective application is hindered by numerous limits and downside. Factors such as lack of explainability, privacy ethics, cost, or reliance on correct data are some of its viability. These restriction may also make AI too expensive for its advantage or perhaps detrimental by violating privacy.

#### **5.1 Insufficient Human Contact**

The advantages of human connection may be lost if AI takes over task that are traditionally performed by humans including teaching and grading. While AI can personalize instruction and feedback, it cannot replace the human teacher interaction its entirety. When it comes to giving personalized feedback and modifying their teaching strategies. AI is frequently less adaptable than teachers. In addition to having access to additional material, teachers can assess the effectiveness of their explanation by observing students body language and facial expression. Instructors can also meet the social and emotional needs of their student by fostering a welcoming classroom atmosphere or by offering encouragement, furthermore, learning is just one aspect of education for girls. Teachers also help kids develop moral ethics diligence, and resourcefulness (Chaffer 2022).

#### **5.2 Ethics Consideration, Data Security Privacy**

Potential data usage issues arise when AI is applied in educational content. Given the recent and explosive growth of AI, the field’s regulation are relatively new and lack historical precedence. In 2023, the European union AI act (EU, AI Act). Which was the first comprehensive set of AI legislation, was introduced, adding their data may not be supported

by many people who are against its gathering or sale. Artificial intelligence, thus specialist must be engaged to create appropriate policies to safeguard AI user, leading to more costs.

### **5.3 Dependently on Correct Data.**

Since AI is dependent on data its efficacy is influenced by the quantity and caliber of data it has access to. AI has the potential to propagate and strengthen negative biases when there is insufficient data or when some data values are overrepresented. For instance, because there is insufficient evidence an automatic essay checker may assign lower ratings to unconventional essay styles, even if they were successful. Systems for keeping an eye out for any biases and flawed AI outputs must be created (Khan et al, 2023). This implies that biased and inaccurate information may be taught to pupils which could reinforce existing biases.

### **5.4 Absence of the Capacity to Explain.**

AI has a problem with not being explainable. Because of the intricacy of the algorithms, developers are unable to precisely understand how the AI arrive at its results, even while they are aware of the data they input and the conclusion the AI draw. AI has been called a black box meaning that we don't fully comprehend how it operates (Chowdhury et al, 2012). This can make AI challenging to control, for instance, if its promoted bosses that require manual correction. If developers do not know what went wrong with AI, it is more difficult to fix it. If AI cannot be explained it also loses its effectiveness. When it comes to teaching, an AI might not be able to explain how it solved a math issue to a student.

### **5.5 Deficit of Contextual Knowledge.**

AI's comprehension of context might be less than that of a human. While AI is capable of ability to make valid conclusions in novel circumstances by its inability to comprehend why a pattern arose (Hoffman, 2023). Furthermore AI training is typically tailored to a particular purpose and environment, which may make it difficult to apply to other situations. Much learning, for instance takes place within the framework of previously taught subjects. Teachers build on the lessons they had learned before, but AI might have trouble personalizing instruction to the same degree as a human teacher.

### **5.6 Cost**

Because AI involves a lot of time and computer power, it can be costly and not all schools can employ it. For AI to execute its programs, more expensive computer systems must be purchased furthermore, hiring individuals is necessary to upgrade and maintain the AI infrastructure. They spent around the same for the game AI Dungeon, according to LinkedIn CEO Nick Walton. AI and humans (Venion, 2023). A sizable budget is needed for AI teaching, which many institutions may not have or may not want to spend on the cutting edge technology.

### **5.7 Decrease in Soft Skills**

Both educators and students risk losing their soft skills – generally, transferable skills if they become overly dependent on artificial intelligence. Time management, leadership, creativity, and other traits are examples of soft skills. Even AI can try to teach these kinds of abilities or help them develop, a lot of soft skills can only be learned through human interaction, which is challenging for AI to start.

## **Conclusion**

It is critical to look at the uses and rules of AI in education given the field's explosive growth. Although artificial intelligence (AI) is still relatively new in the education industry,



given its rapid growth, it may play a major role in education in the next decades. As a result we must investigate the safe and efficient application of AI, to make their goals clear, AI applications in education can be categorized as “Students” “Guidance” and “Teacher” because of the organizational framework that aids in developers understanding of the sector, groping them in this way facilitates the development of new educational applications. Previous methods guiding principles can be applied to present accelerating advancement by not recreating the wheel Notwithstanding AI potential, there are still issues that need to be resolved, like cost, technological restrictions, and ethical considerations by appraising the use of AI in education and comprehending its limitation we may create secure and efficient AI driven solution for the field of education.

But it’s important to keep in mind that AI should support human writers not take their place. AI system are currently unable to duplicate the critical thinking inventiveness, and nuance required for academic writing/learning activities.

## **Recommendations**

- 1. Training for teachers and provide support**
  - a) Educators are to be trained in AI tools and Digital Pedagogy
  - b) Professional development should focus more on integrating artificial intelligence strategies to teaching
- 2. Fair use and ethical consideration**
  - a) Strict data privacy policies should be implemented to protect student information
  - b) Artificial intelligence system should be regularly audit for fairness and bias
  - c) Educators and parents should be involved in discussions related to artificial intelligent role

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