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# The Role of Artificial Intelligence in Formal and Informal Education for Students

Treesa Thomas

Assistant Professor, Department of Management Studies, Santhigiri College, Vazhithala

**Abstract:** Artificial Intelligence (AI) is transforming the field of online learning by providing personalized and efficient learning experiences for students. AI-powered online learning platforms can analyze data on students' learning styles, preferences, progress, and performance, and use this information to tailor the curriculum, content, feedback, and support for each student. AI can also enhance the engagement and interaction of online learners by using chat bots, virtual assistants, and intelligent content recommendations.

According to a report by eLearning Industry<sup>1</sup>, AI is expected to grow by 48% in the eLearning market by 2024, reaching a value of \$3.68 billion. Some of the factors driving this growth are the increasing demand for personalized learning, the availability of big data and cloud computing, and the advancement of AI technologies. However, there are also some challenges and limitations that need to be addressed, such as the ethical, legal, and social implications of AI, the quality and reliability of AI systems, and the need for human oversight and intervention. Artificial Intelligence (AI) has the potential to revolutionize the way we teach and learn, making education more personalized, efficient, and effective. In this paper, we explore the role of AI in both formal and informal education for students. The fundamental goal of AI research includes the representation of knowledge, reasoning, planning, learning and processing, and the capability to use objects [2]. We discuss the benefits and challenges of implementing AI in education and provide examples of how AI is being used in education today.

**Keywords:** Artificial Intelligence, Personalised Learning, platforms, Adaptive Assessments, Educational Games, Learning Management Systems

## I. INTRODUCTION

In recent years, Artificial Intelligence (AI) has emerged as a powerful tool for transforming education. AI has the potential to personalize the learning experience for students, enabling them to learn at their own pace and in a way that suits their unique learning styles. AI can also help educators to identify areas where students are struggling and provide targeted interventions to help them succeed. Many types of approaches are practiced for achieving AI goals, such as statistical modeling and computational intelligence. AI not only affects the field of computer science but also attracts fields of mathematics, engineering, linguistics, and many others.[3]. Moreover, researchers also show there to be positive effects of social robots on learning. They do not only help to provide real classrooms, such as environment, but also facilitate them to engage and communicate with other colleagues and teachers[4]

In this paper, we explore the role of AI in both formal and informal education for students. We discuss the benefits and challenges of implementing AI in education and provide examples of how AI is being used in education today with the help of a survey conducted with 100 students. We also examine the potential of AI to transform education in the future.

## II. METHODOLOGY

### A. Respondents

The respondents in this study were 100 students from various educational institutions. The sample was selected using a convenience sampling method, where students were recruited through social media platforms and email invitations. The sample consisted of students from different age groups, genders, and educational backgrounds.

### B. Data Collection

Data was collected using a survey method. The survey was designed to collect data about the role of AI in formal and informal education for students. The survey consisted of 20 questions and was administered online using Google Forms. The questions were designed to collect data about the following topics:

- 1) Demographic information about the respondents
- 2) The respondents knowledge of AI
- 3) The Respondents perceptions of AI in education
- 4) The Respondents experiences with AI in education
- 5) The Respondents opinions about the future of AI in education

The survey was administered to the participants over a period of two weeks. Respondents were given the option to complete the survey at their own pace and convenience.

### III. DATA ANALYSIS

For the purpose of data analysis a questionnaire is prepared including demographic factors like Name, Age, Gender and Degree Course Name.

The data collected from the survey was analyzed using descriptive statistics. The data was entered into a spreadsheet and analyzed using Microsoft Excel. Percentage method is used for analysis.

$$\text{Percentage of Respondents} = \frac{\text{No of Respondents}}{\text{Total No of Respondents}} * 100$$

#### A. Limitations

There are several limitations to this study. First, the sample size was relatively small, which may limit the generalizability of the findings. Second, the sample was selected using a convenience sampling method, which may introduce bias into the study. Finally, the survey method may be subject to response bias, where participants may not provide accurate or truthful responses.

Despite these limitations, this study provides valuable insights into the role of AI in formal and informal education for students. Further research is needed to explore this topic in more detail.

#### B. The Role of AI in Formal Education

AI has the potential to transform formal education by providing students with a more dynamic and efficient educational landscape. Here are some ways AI is being used in formal education:

- 1) *Personalized Learning*: AI can be used to analyze individual learning patterns via adaptive learning platforms, designing content to suit dynamic needs. Intelligent tutoring systems offer real-time feedback, promoting a supportive and interactive environment. Additionally, AI automates administrative tasks, enabling educators to emphasize customized instruction.
- 2) *Automated Grading*: AI can help grade exams using an answer key, compile data about how students performed, and even grade more abstract assessments such as essays.
- 3) *Learning Management Systems*: AI can be used to provide personalized learning experiences, adaptive content delivery, and real-time feedback mechanisms. This empowers educators to customize their teaching strategies according to the distinct needs of each learner.
- 4) *Chatbots for Enrollment and Retention*: AI-powered chatbots can be used to provide students with 24/7 support, answering questions about enrollment, financial aid, and other administrative tasks.
- 5) *Transcription of Faculty Lectures*: AI can be used to transcribe faculty lectures, making them more accessible to students who may have missed the lecture or have hearing impairments.
- 6) *Analyzing Student Success Metrics*: AI can be used to analyze student success metrics, such as attendance, grades, and participation, to identify students who may be at risk of falling behind and provide targeted interventions.

#### C. The Role Of Ai In Informal Education

AI can also play a significant role in informal education, providing students with personalized learning experiences outside of the traditional classroom setting. Here are some ways AI is being used in informal education:

- 1) *Adaptive Learning Platforms*: AI can be used to provide personalized learning experiences, adaptive content delivery, and real-time feedback mechanisms. This empowers learners to customize their learning strategies according to their distinct needs.
- 2) *Language Learning*: AI can be used to provide language learners with real-time feedback on pronunciation, grammar, and vocabulary. AI-powered chatbots can also be used to provide language learners with conversational practice.
- 3) *Educational Games*: AI can be used to create educational games that are engaging and interactive, providing learners with a fun and effective way to learn.

- 4) *Virtual Tutors*: AI-powered virtual tutors can be used to provide learners with personalized feedback and guidance, helping them to master new skills and concepts.

#### IV. FINDINGS

- 1) 90% of the students states that they are familiar with Ai in education
- 2) About 70 % students are using AI tools in their education and Assignment works.
- 3) The advantage of using AI in education is that they can acquire knowledge and detailed explanation about anything within a fraction of second.
- 4) Most of the students are highly satisfied with the usage of AI tools for Education purpose to clear their doubts.
- 5) More than 95 % students states that AI has got a positive impact on their learning outcomes.
- 6) Coursera is an online learning platform that uses AI algorithms to provide personalized learning experiences for students in higher education courses
- 7) 60 % of the students states that they interact on AI system tools using Text, and the rest using voice.
- 8) The major advantage of AI is the boosting of productivity, Enhanced learning Experience and Improved Research works.
- 9) Tools like AI text-to-speech help convert written content into voice speech for clearer understanding.
- 10) The AI tools used by students are ChatPDF, Lumen 5, and AskCodi ,Copilot, Bing ,Duolingo Max etc to do their works
- 11) Grammarly helps the students in speaking and Writing their academic works.
- 12) Extending beyond academic subjects, AI tools also help in skill development across various domains. Students use tools to create AI images, videos, and PowerPoint presentations out of simple text prompts. This helps them enhance their artistic expression and creative skills

#### V. CHALLENGES OF IMPLEMENTING AI IN EDUCATION

Implementing AI in education comes with its own set of challenges. Some of these challenges include infrastructure and technology barriers, limited resources, outdated technology, cost constraints, and lack of expertise. It is important to address these challenges to ensure that AI is used effectively in education. . AI can also augment human capabilities, by providing tools and assistance that enable humans to perform better and more efficiently. AI can perform certain tasks faster and more accurately than humans, such as data analysis, image recognition, and natural language processing.

#### VI. CONCLUSION

AI has the potential to revolutionize the way we teach and learn, making education more personalized, efficient, and effective. In this paper, we explored the role of AI in both formal and informal education for students. We discussed the benefits and challenges of implementing AI in education and provided examples of how AI is being used in education today. We also examined the potential of AI to transform education in the future. It is important to continue exploring the possibilities of AI in education and to work towards overcoming the challenges that come with it. By doing so, we can create a more dynamic and efficient educational landscape that empowers learners to achieve their full potential.

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