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Research Paper

Impact of Artificial Intelligence on Education

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Abstract
There has been an increase in studies about artificial intelligence (AI) in the educational field, and many scholars in this field believe that the role of teachers, school and leaders in education will change due to AI. In this study, the research aims to explore potential opportunities arising from the incorporation of artificial intelligence (AI) in education and to uncover the implications it may have for the future of schools and universities. The opinions of participants from different sectors of educational institutions have been examined for this study, and the result is that AI will be beneficial to both students and teachers in schools, but it would also have drawbacks. While participants generally seem to have positive perceptions towards AI, there are also certain drawbacks, especially highlighted by teachers and academicians, regarding the future of teaching.

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I. Introduction

Artificial intelligence (AI) is the simulation of human intelligence processes in robots. It is generally expressed by the public as the ability of computers or machines to act and think in a way that humans do. It represents the efforts towards computerized systems to imitate the human mind and actions. Ng (2017) claims artificial intelligence to be the new electricity of this age. It is one of the most essential tools today, and it is a powerful factor in the country's economic development. Investments. Artificial intelligence broke a record in China with $40 billion in 2017 (Mou, 2019). In line with its earnings from AI, China is expected to increase its gross domestic product (GDP) by 26% ($7 trillion) by 2030. North America is expected to have a 14.5% increase ($ 3.7 trillion) in the same timeframe (PwC, 2017). This shows that artificial intelligence will be incorporated more in many sectors, including education.

Schools will soon be expected to adapt to the digital world and include new technologies to make teaching and learning more efficient. The new forms of technology will fill in our lives and captivate our youth, and this case may leave schools with no choice but to make room for them. Yet, different fields have different opinions on artificial intelligence. Thus, the purpose of this study is to examine what the use of artificial intelligence in education means and what kind of implication it can reveal for the future of education, according to the opinions of the participants from different sectors.

1.1. *Artificial Intelligence in Education*

Schools aim to have faster classes that produce a better output in a short amount of time. Is this possible to do in the 21st century without incorporating the new technologies such as AI? What opportunities can artificial intelligence offer in education that will differentiate people from robots or smart vehicles and help humans keep their emotional and social aspects? Most probably soon, these topics will be the main agenda of policymakers and implementors in the field. In fact, plenty discussions have taken place asking if AI can truly replace teachers or not.

The results of these studies as follows: the use of artificial intelligence in education will make learning more individual, provide effective learning experiences, enable students to discover their talents, improve their creativity and reduce teachers' workload. It is also emphasized that good teachers will continue to exist in the future helping boost the children's efficiency, morale, creativity, and intelligence. As a matter of fact, it is said that AI will help make the people more human. Despite all of this, this is also seen as a threat. Transferring the roles of teachers to computers is seen as a danger in the studies on artificial intelligence.

Increased usage of artificial intelligence in education is poised to bring about significant changes in both education systems and their processes. Based on the study results, Sekeroglu, Dimililer and Tuncal (2019) stated that artificial intelligence has the potential to assist teachers in enhancing personalized education for their students. This technological advancement holds the promise of granting access to suitable and improved learning opportunities for many individuals and communities such as the people facing exclusion, those with disabilities, refugees, individuals currently not enrolled in school, and those residing in isolated communities.

There are many tasks the teachers do manually currently, such as marking attendance, answering the same questions about topics, repeating information, and other administrative tasks. This can be resolved by a dual-teacher model with artificial intelligence in terms of individualized education. In-class artificial intelligence-supported assistants would act as secondary teachers and will reduce the time spent on routine procedures, which will help teachers focus on student guidance and one-to-one communication.

II. Research method

This is a review, study and analysis of some given literature that have been acknowledged. The research was designed as a phenomenological study, which is a qualitative research method. Through this research, I have tried to uncover different participant's opinions on artificial intelligence in education. The data collected is based on the perceptions of participants on artificial intelligence in education from four different professions.

1.2. Participants

Purposeful sampling was preferred during the determination of the participants. Four target groups were approached regarding AI in education:

- Academicians; academics working in the field of educational sciences (5 people)
- Experts; technical experts on artificial intelligence (4 people), in private or public organizations
- Legal Experts; lawyers and judges currently working in courts (5 people)
- Teachers; teachers currently working (5 people) in public schools

1.3. Collection of Data and Analysis

The questions were first sent to all 19 participants in an online form. This form included questions such as 'what they think of AI, the positive and negative implications they have on AI in education, how it will be integrated into education, the future outlook of AI' along with a few other questions. After this, face-to-face interviews were conducted with the participants regarding what they wrote in the form to gain a better understanding of the responses.

All the data were analyzed according to the content analysis method from codes to more holistic themes. Every single response was evaluated in detail, and the participants were given a chance to elaborate and clarify their written responses during the voluntary face-to-face meetings.

1.4. Trustworthiness

In qualitative research, trustworthiness is utmost essential. To ensure data validation, the data source triangulation method (Streubert & Carpenter, 2011) was used. To employ a more trustworthy process in the study, the data collection, coding, tabulation, and reporting stages of qualitative research are followed by an expert academician in the field. The participation of experts from different fields in the study on artificial intelligence in education provided a rich and different data source. The compatibility of the data with similar studies in the literature was examined in detail. A content comparison was done by providing data and results from multiple data sources. The working process, purpose and methods were clearly stated to the participants, and they were told that they have a right to quit the study anytime they wanted.

III. Findings

The main themes obtained in this section are built on the codes most emphasized by the participants. It was seen that the participants firstly emphasized the products, applications, and outputs that will enter our lives with the arrival of artificial Intelligence in education when the data was analyzed. Many aspects such as drawbacks, benefits, suggestions were mentioned, and they have been explained below.

1.5. Products (Outcomes)

There are products and solid outcomes expected in the education sector by the participants. Under the products dimension, these products and solid outcomes expected in education are listed. The products are as follows:

- Individualized education (pertains to individualization of instruction),
- Robot assistants and robot teachers,
- Advanced technology software,
- Simulations for education and lessons,
- Smart classes in schools,
- Scenario and case study-producing systems,
- Programs or tools for taking attendance,
- Learning outcome detection system (for levels of students),
- Personal teaching tools,
- Attention and distraction analysis system,
- Systems that perceive and report students' learning patterns,
- Interest, ability, and needs analysis systems,
- Academic success detection and suggestion system for improvement.

All of these are possible ways for incorporating AI in education in the future. Artificial intelligence in education can be used in many areas from individual learning, examination opportunities, face recognition system to taking attendance at the entrance to the class.

1.6. Drawbacks

According to the participants, AI had a few drawbacks potentially. These drawbacks are listed in this theme:

- Mechanical thinking of individuals, suppressing intuitive knowledge
- The humanistic values could be replaced by a utilitarian or pragmatic perspective,
- Data security,
- The information-oriented human type,
- No need for human intervention in education,
- Negative effects on social relationships.

Participants mentioned a few other concerns and drawbacks separately. This included risks such as "AI will assert dominance over the sector leaving not much need of human beings". Plenty other concerns were raised similar to these especially by the teachers.

1.7. Benefits

Here, the results obtained from the opinions of the participants about the benefits of using artificial intelligence in education are presented. Accordingly, these benefits are:

- More effective individual learning process,
- No more paperwork in schools,
- Correct determination of the individual's need,
- Helping individual at learning at their own speed,
- Practical solutions to chronic problems,
- Helping the right decisions with fast data analysis,
- Prevention of waste of time,
- Increase in education quality,
- Planning teaching according to student capacity and speed,
- Providing ease of work.

The main benefits include the fact that the student's information can be monitored, evaluated, and planning can be made about which profession that this student should focus on in the future. It also helps keep track of attendance easily and can help personalize learning, making it fun and enjoyable for the students.

1.8. Suggestions

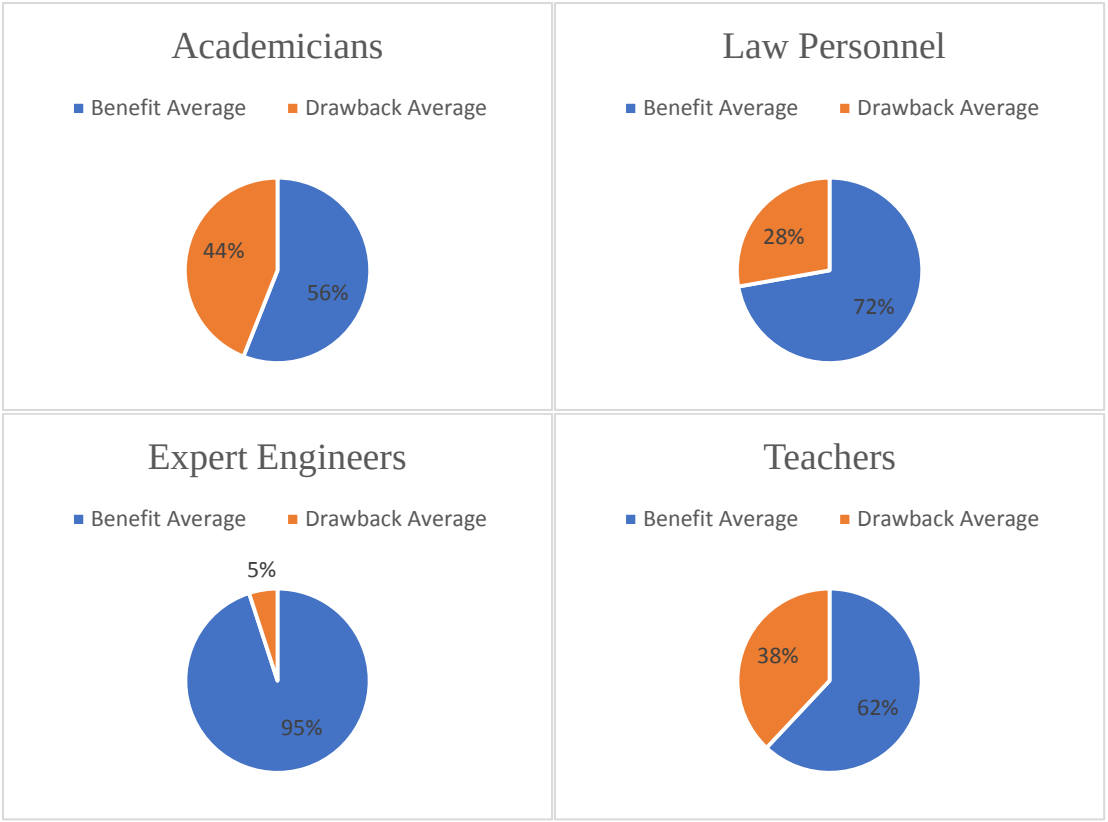
The participants had suggestions regarding the use of artificial intelligence in education. These suggestions are as follows:

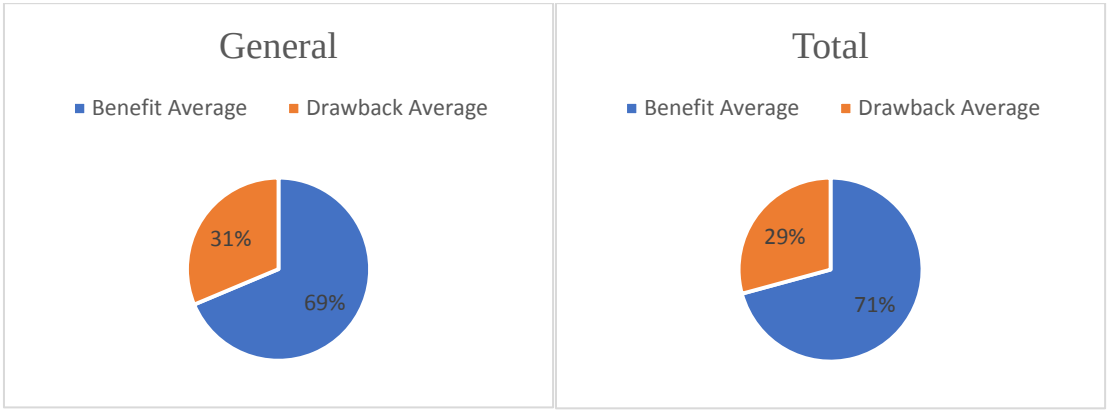
- Human psychology should not be ignored.

- There should be a certain measurement system when using artificial intelligence in education.
- The AI integration process should proceed in a way that does not affect social relations negatively.
- Applications or systems developed regarding artificial intelligence in education should be tested with pilot applications and integrated into the system according to their results.
- Academic studies should be done on the developed systems and analyzed.
- The effects of artificial intelligence-related systems on the decision-making power of people in their lives should be measured.
- Artificial intelligence in education is not a comprehensive solution; it should be used only in the areas of need.
- The process should be carried out in an interdisciplinary fashion with all stakeholders, not just educators and engineers.

Table 1. Distribution of benefit - Drawback Percentages by Groups

Groups	Benefit Average	Drawback Average
Academicians	56.00%	44%
Law Personnel	72.20%	27.80%
Expert Engineers	95.00%	5.00%
Teachers	62.00%	38.00%
General	68.67%	31.33%





It is thus concluded that the use of AI should be done carefully. A conscious use of artificial intelligence must be present, and AI should be preferred only for the areas that are needed. It should not be used unnecessarily. AI should be a helping and supporting tool, it should not completely take over education in educational institutions.

The participants generally viewed AI developments positively. Academicians may have evaluated the possible benefits and harms of teaching solely in terms of teaching professions and may have seen possible problems in the teachers' future, while they seem to accept the benefits in teaching processes. Expert engineers, on the other hand, stated that in terms of systems, AI would bring quality and benefit for all in the education sector.

IV. Conclusion

There were 4 main themes produced from this study. The first theme is the products, which is what is expected to see of AI in the near future. This includes technology to personalize learning, make routine tasks easier for both teachers and students, and having different simulation programs. Using AI, the one-size-fits-all approach that is being used can be replaced to have more personalized and adaptive learning for every individual. Thus, we can say that AI will be a huge support to students and teachers.

The second theme was the drawbacks and risks of AI. The participants believe that with the integration of AI, robotic assistants and tutors would become more favorable than humans as teachers and this would create a problem in job security of all the teachers. Participants in the study believed that widespread use of AI would result in an overly mechanical way of processing information, a pragmatic approach, less room for teachers, ethical and security issues, and negative social effects in relationships. In the current situation, uncontrolled, inappropriate, or excessive mobile phone use appears to be causing behavioral, social, and affective difficulties. Another major concern in the community about AI is the elimination of jobs.

The third theme was the benefits of AI. This theme is similar to the first theme, except here it is focused on the functions of AI. It can be used to eliminate paperwork, and have all files completely organized on its own. It can help increase quality of education without wastage of time and effort. Thus, AI will better address the needs of learners and help students learn at their own pace. Another benefit of AI in education is guiding students in mastery, repeating lessons as needed, and quickly designing a personalized learning plan for each student.

The fourth and final theme included all the suggestions from participants. The main suggestions were to proceed carefully with AI in a way that social relations and humanity is not affected harmfully. Artificial intelligence technologies are an exciting area for humans; however, it is not a cure for everything or an improvement that will bring absolute good.

In conclusion, there will be associated benefits, drawbacks, and risks for schools with the arrival of AI into schools. Most of the participants believe AI will open new opportunities for students and learners, which normal classroom or educational tools may not deliver. But there could also be problems caused by AI. Schools need a proactive approach towards AI to unsure that it is being used correctly and up to its full potential.

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