Impact of Artificial Intelligence in Education Sector: A Qualitative Study in Indian Context

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Abstract

With the increased study of artificial intelligence (AI) in the context of education, many experts anticipate that the role of teachers, schools, and educational leaders will alter. In this sense, the goal of this research is to look at what conceivable possibilities exist with the entrance of AI into the classroom and what sort of repercussions it might reveal about the future of schools. The study was created as a phenomenology study, a qualitative research method that evaluated the perspectives provided by people from various sectors. With the entrance of AI in education, schools academics and teachers will have new goods, benefits, and drawbacks, according to the findings. The findings make some recommendations for using AI and avoiding potential difficulties. While most participants appear to have positive attitudes about AI, there are certain concerns about the future of education that have been raised by teachers and academics. It also suggested Lawyers and jurists are more concerned with the legal foundations for AI educational institutions and future obstacles, whereas engineers regard AI simply a tool to improve quality and benefits all in the education sector.

Keywords: Artificial Intelligence, Education, Schools, Teachers, academics.

1. Introduction

Artificial intelligence (AI), defined by people in general as the capacity of machines or computers to process information and make decisions like humans, represents efforts by computerized systems to mimic the human mind and actions (Wartman & Combs, 2018). In this regard, the fundamental concept of artificial intelligence is the skilled mimicking of human conduct or intellect by instruments or programmes (Mohammed & Watson, 2019). According to Ng (2017), artificial intelligence is the new electricity of the present day. Artificial intelligence is a possibility to be offered as the basic component of the Fifth Industrial Revolution due to its potential to be a major force in assuring economic development (Golic, 2019).

According to Timms (2016), it could be a fiction of the current system to believe that artificial intelligence will soon be available in home computer formats. It could enter our life in various forms and roles. That might clarify why Chinese investments in artificial intelligence reached a new high of $40 billion in 2017 (Mou, 2019). China's gross domestic product (GDP) is predicted to rise by 26% ($7 trillion) by 2030, corresponding with its AI revenues. In the same time span, North America is anticipated to grow 14.5% ($ 3.7 trillion) (PwC, 2017). These data help to comprehend the added value and worldwide influence of artificial intelligence for the coming year's economy, and in our case, for the development of education, and that in effect guides the market and workforce, leading the way for the next Industrial Revolution.

The within-depth growth of artificial intelligence will have a wide-ranging impact, from the broad reorganization of the social order to the teaching and administration procedures in classrooms and schools. Schools that must adjust to the age of technology and integrate 21st century skills into their main agendas are among the primary institutions that may be most impacted by the advancement of artificial intelligence.

According to Karsenti (2019), new kinds of technology are going to appear into our lives and fascinate our kids, and this situation may force schools to make way for them. This study focuses on how participants from the law, business, higher education, and engineers see this progress and how they envision artificial intelligence in education. Consequently, the primary goal of the present investigation is to discover potential the utilization of artificial

intelligence in educational institutions entails along with the implications it might disclose for the foreseeable future educational sector, based on the perspectives provided by individuals from many different industries.

1.1   Artificial Intelligence in Education Sector

Manyika et al. (2017) highlight the importance of good instructors in the future, teaching programmers aimed to improve students' affective thinking, imagination, and communication skills. Indeed, advances in artificial intelligence and technology, according to the aforementioned authors, will make 'humans more natural'. When it comes to educational studies on artificial intelligence, Haseski (2019) summarizes the findings as follows: the application of artificial intelligence in education will make acquiring more oneself, deliver efficient learning instances, allow learners to figure out their unique abilities, strengthen their innovative thinking, and minimize the job of teachers Workload. That suggests there are opposing viewpoints. Outsourcing teacher jobs to computer is viewed as a risk in the field of artificial intelligence research (Humble & Mozelius, 2019). States and nations must establish an educational profile that will engage with these networks of support in order to set themselves up for such a future (Wogu et al., 2018).

Roll and Wylie (2016) describe Henry Ford as saying, "If I had inquired about folks exactly what they intended, they would have likely said speedier horses." On a superficial level, it appears that educational institutions have evolved into 'faster classrooms' that generate outcomes in shorter periods of time. However, will these 'quick classrooms' continuing to exist or would cognition in the twenty-first century change? Is it enough to provide abilities, analytical thinking, and cognitive processing skills as we approach the twenty-first century? Or must we design new mechanisms for the new era that have never been imagined before? What educational opportunities can artificial intelligence provides that can distinguish people from intelligent robotics or intelligent machines while also allowing people to retain their personality traits and social aspects? These issues are likely to dominate the agendas of authorities and field executioners in the near future; in fact, there are currently already talks over whether AI is capable of replacing educators (Felix, 2020).

Even though artificial intelligence research studies in the classroom have received a lot of interest recently, studies on the theory of artificial intelligence in general may be tracked as far as possibly the fourteenth century, and these investigations resurfaced in 1937 thanks to Alan Turing's contributions (Humble & Mozelius, 2019). They are increasingly gaining prominence in academic publications and scientific communities. As 'artificial intelligence management' has started to be addressed in the literature (Canbek, 2020), we witness an expansion of AI research in organizational management.

With the use of artificial intelligence in education, considerable changes in educational institutions and processes are possible. According to the study findings, Sekeroglu et al. (2019) believe that machine learning could assist educators in providing more personalized instruction to their learners. Artificial intelligence can help disadvantaged people and communities, such as those with disabilities, refugees, abandonment, and those living in isolated communities, gain access to suitable and improved educational opportunities (Pedro et al., 2019). According to research, with the assistance of artificial intelligence technologies and intelligent educational surroundings, effective specifically personalized strategies can be offered (Mohammed & Watson, 2019). Although it appears that successful education necessitates the hands-on involvement among human teachers, artificial intelligence envisions boosting quality of education at all levels of difficulty, particularly through personalization (Grosz & Stone, 2018). In terms of individualized education, Pedro et al. (2019) highlights a dual-teacher arrangement that utilizes artificial intelligence: educators spend an excessive amount of time on every day and other administrative responsibilities, such as reiterating frequently and answering inquiries concerning many topics, instead in-class artificial intelligence-supported employees (secondary teachers) will cut down on the amount of time expended on mundane tasks, allowing teachers to devote their energies to student support and direct interaction with students.

2.   Research Method

The study was designed as a phenomenology study, which is a type of qualitative research. When it is intended to investigate a topic or subject in broad terms, qualitative investigation is suggested (Creswell, 2013). As a result, we attempted to elicit the participants' perspectives on AI in education. A triangulated collection of information strategy was used in this study to assess participants' perspectives of intelligent technology among educators from four distinct professions.

2.1   Participants

During the selection of individuals, purposeful sampling was recommended. Researchers in the domain of artificial intelligence for educational purposes have determined five target groups, comprising 200 people:

- Academics (employed in the faculty of education).
- Experts (technical experts in private or public institutions).
- Legal Counselor (Judges and Lawyers practicing in Courts).
- Teacher (working in public school).
- General (Parents having minimum graduation qualification).

2.2   Collection of Data and Analysis

Questions to assess participants' perspectives throughout the context of the study were developed with the help of three education-related specialists. The surveys were first delivered to the people taking part in the structure of an online form, which they completed. Face-to-face interviews conducted later conducted with the participants to obtain deeper knowledge on the subject. The people who participated were supposed to convey themself better alone through written responses during the first collection of information, whilst the investigators demonstrated the issues that needed additional explanation during the second voluntarily face-to-face conversation.

In the study, interviews with a semi-structured format were used. Respondents were asked online whether they thought of AI, how this technology will be implemented in education, the future perspective, the good and negative consequences they saw for AI in education, and other topics. The responses to the preceding questions were used to examine participants' perspectives about the employment of artificial intelligence in schooling.

From codes to additional holistic topics, all material was evaluated using the subject-matter analysis approach. The goal here is to go through the data obtained from everyone who participated line by line. First, codes were established, which led to themes that are eventually equivalent to literature. All of the syntax was considered at each processing step and in choosing the themes. Additional clarification was provided in the results section for the codes identified in the study (e.g., individuality of training). The participants' perspectives on AI are studied into the context of their prior experience and comprehension of AI, with various situations in mind. As seen in Table 1, just one inquiry (the final question) was assigned a code using a predetermined number structure.

2.3   Trustworthiness

The value of credibility in qualitative research cannot be overstated. Each of the information collecting, coding, tabulation, and dissemination stages of qualitative investigations is overseen by a recognized scholar in the subject to ensure a more trustworthy procedure in the study. Furthermore, the researchers revealed their first thoughts on the issue. Participants were asked to provide tentative judgments. The data source triangulation approach was utilized (Streubert & Carpenter, 2011).

We also attempted to evaluate several AI research ranging from healthcare to industry in order to enable viewpoint harmonization. In the field of qualitative study, triangulate refers to the use of several methodologies or data sources in order to build a full knowledge of instances or situations (Patton, 1999). The involvement of specialists from other sectors in the research of artificial intelligence for educational purposes provides a large and diverse data base. The data's consistency with similar research in the available literature was thoroughly investigated. Data and findings from numerous data sources were used to do a content comparison. The preconceptions of those conducting the study were minimized. Raw data as well as analyzed variants are saved for future controls. Everyone who participated was properly informed about the production process, goal, and methodology.

3.   Findings

The primary themes acquired in the following section are based on the codes most strongly emphasized by the participants. The characters provided within the context of the concepts are not ordered by occurrence value; nonetheless, the most emphasized ones are shown below along with their explanations. When the data was evaluated, it was discovered that respondents prioritized the goods, apps, and outputs that would infiltrate our everyday lives along the coming of artificial intelligence, with the remainder of the topics outlined below. We attempted to include a few

generic phrases under every dimension because participants discussed various issues under goods, problems, benefits, and ideas.

3.1 Products (Outcomes)

The goods and solid achievements envisaged in the realm of education for those who participated were deemed to be conveyed under this subject. We mentioned the possible educational goods and results under the product category. Products comprised not just physical equipment, but also applications, systems, methodologies, and simulations. The following are some goods which might stand out or have a significant role when dealing with artificial intelligence:

- o Advanced technological application
- o Robot companions and instructional robots
- o Smart classrooms in schools
- o Individualized education (refers to instruction individualization)
- o Composites for instruction and learning
- o Systems for analyzing interests, abilities, and requirements
- o Systems for vocational counseling (for job selection)
- o Attendance tracking software or tools
- o Various unmanned systems
- o A mechanism for detecting learning outcomes (based on student levels)
- o Individual teaching tools
- o System for attention and distraction research system
- o Student achievement detection and optimization system
- o Instructional apparatus for cloud and virtual learning situations
- o Curriculum modification system
- o Number of other systems that recognize and report students' learning tendencies.

In endorsement of the products/outcomes topic, Aryan (an academician) informed us, 'Artificial intelligence for educational purposes may be employed in various areas from personalized learning, assessment opportunities, facial recognition technologies to collecting registration at the moment of entry to the class.' and emphasized techniques for personalizing learning. Similarly, Vikram (an attorney) stated, 'Providing individualized instruction via encapsulating schooling through artificial intelligence.' Furthermore, Tushar (an expert engineer) remarked that 'Curriculum planning may be entrusted to artificial intelligence techniques/tools by establishing algorithms based on machine learning relevant to the pedagogical system.'

3.2 Drawbacks

The potential downsides and hazards of using artificial intelligence for educational purposes were discussed in this subject. These disadvantages, determined by the participants, are as follows:

- Individuals' procedural thinking, which suppresses intuitive understanding.
- The ethical principles might be switched out for a purely practical or utilitarian approach.
- The potential adverse events could be replaced with comprehensive assessments for pupils, classification of persons based on IQ, and so on.
- The information-oriented human personality.
- The absence of the necessity for interactions between individuals in education.
- The potential application of unsupervised intelligence technology for instructional purposes (e.g., data security).
- Negative consequences on connections with others.

In the interviews, participants individually noted potential risks and disadvantages. There will be hazards, particularly among teacher participants. According to Sunanda (a teacher), "Artificial Intelligence is going to broaden its authority over the world [with little need to require human participation]." According to Sanjeev (an academic), "Some sort of hybrid machine-human style, mechanical-thinking folks are patiently awaiting for us". "I believe we will cease to require teachers in the long future," says Garima (a teacher). Deepak (a jurist) shares the same views as instructors, claiming "Artificial intelligence will take control over all instructional tasks; even educators may not be needed." The

consequences of dystopia robotics films as well as mainstream media, which certain participants feared may come true; represent some of the likely sources of these fears.

3.3 Benefits

In this context, the results and the answers obtained from the opinions of the person who participated about the advantages of using the artificial intelligence in the field of education are presented below:

- Measuring people
- Assisting individuals in learning at their own pace
- Correctly determining the individual's needs
- Practical approaches for chronic issues
- No more documentation in schools
- Time saving money
- Increased quality of instruction
- Ease working conditions
- Helping the right selections with fast analysis of information
- Planning teaching based on student capacity and speed
- Using or selecting effective learning methods based on a learning assessment
- Ability to provide instruction in smaller groups with successful scheduling
- Assisting policymakers, for example, with population forecast scenarios for making the right expenditures on education in locations that are appropriate.

As an advantage of artificial intelligence, the student's knowledge may be watched, reviewed, and plans can be formed on which career, this student should concentrate on in the future,' Sarabjeet (an academician) claimed. Chander Mohan (an experienced engineer), a different participant, informed the investigators about 'Frequent reporting of kids' situations at school, developing proposals based on these observations, and sharing with appropriate persons for betterment of students' According to Seema (a jurist), 'Artificial Intelligence techniques can assist in judging the outcomes of examinations, student campaigns, and interaction amongst students'. According to Ashok (a teacher), an AI tool can analyze the speech of pupils and assess the amount that they have learnt, and deliver supporting regulatory guidelines appropriately. Participation suggestions are closely similar to the positive effects that may result from 'learning analytics' in the available research.

3.4 Suggestions

This context included the suggestions provided by the respondents which included the use of artificial intelligence in the sector of education. These suggestions or recommendations are presented below:

- When employing artificial intelligence in education, a specific measuring method should be used.
- Artificial intelligence in educational apps or systems need to be evaluated with pilot applications then incorporated into the overall structure based on their outcomes.
- Academic research and analysis should be conducted on the produced systems.
- The infrastructure that is required should be built.
- A method for auditing should be implemented.
- The psychology of humans must not be overlooked.
- It is necessary to create preventive and supporting software.
- The consequences of artificial intelligence-related technologies on people's decision-making abilities in their daily lives should be assessed.
- The AI integration process ought to occur in a way that is not having a detrimental impact on social relations.
- The process should be carried out using a multidisciplinary fashion involving all stakeholders, not only educators and engineers; artificial intelligence in the classroom is not a holistic solution it should be employed exclusively in areas of necessity.

Kamal (a teacher) stated at this time, 'A mindful usage of artificial intelligence is required to represented; AI should be favored exclusively for those domains that are essential.' 'We ought to tread carefully,' Vishal (a professor) added.

Academic studies are possible. It is critical to test pilot implementations.' 'Artificial intelligence (AI) technologies should be properly connected to human oversight in order to reduce hazards'.

Because technology has the greatest impact on mankind, it is critical that every step of this procedure is carried out legally so that nobody is harmed. Ritika (a lawyer) stated, 'If it is founded on legal laws, the negatives can be minimized.' In terms of legal scenarios, Mahendar (a jurist) mentioned his thoughts on data confidential information: 'The preservation, protection, and anonymity of personally identifiable information in coming artificial intelligence systems must be vital because folks have special worries with intellectual analysis, along with the assessment of one's identity would reveal a person's entire life. This problem should be tackled in two sections: 1- To develop the necessary resources for the authorities to meet this commitment, and to provide communication to the relevant body via tight procedures. 2- Authorities should impose deterrent sanctions to prevent breaches of confidentially and to eradicate breaches having the least amount of harm'.

The final question provided to those who responded had a narrative aspect: How do you characterize AI tools for teaching when considering artificial intelligence-supported instructional environments?' Could you kindly tell us if AI is good or harmful?' Participants responded with percentages as to how much damage and advantage they perceive in the combination of AI with academia and civilization; they emphasized on both positives and downsides. The answer to the questions is shown in Table 1.

Table1: Distribution of Benefit-Drawback Percentages by Groups.

Groups	Benefit Average	Drawback Average
Academicians	57.00%	43.00%
Teachers	63.00%	37.00%
Law Personnel	72.20%	27.80%
Engineers	94.00%	6.00%
General	67.67%	32.33%

In this regard, the panelists were largely favorable about AI breakthroughs. Academics may have examined the potential advantages and drawbacks of teaching only in terms of careers as educators and may have identified potential issues in the future of professionals, despite their seeming acceptance of the positive aspects in teaching procedures. Qualified engineers, on the contrary present, argued that AI will provide reliability and benefit to everybody in the educational field in terms of systems.

4. Conclusions

The participant discussions yielded four primary themes along with a descriptive topic on AI in learning. The first focus was about goods, which featured solid AI media, programs, or future results. These included simulation programs, evaluation-testing assistance systems, virtual reality class and helper robots, and personalized educational systems. One of among the most hotly debated aspects of AI as a potential consequence is its influence on personalized learning through the tools it offers. In education, artificial intelligence could offer powerful technological assistance for personalized instruction (Chang & Lu, 2019). Goksel and Bozkurt (2019) discovered adaptive learning, personalization, and learning modes as the core important nodes and themes in their examination of articles on education and AI studies. This indicates that using AI in education to provide personalized learning for all pupils can replace a one-size-fits-all strategy. As a result, we can conclude that growth in education may meet the needs of optimal educational experiences with AI and its accompanying tools, which will be a big assistance in aiding instructors and students. In this context, Abdelsalam (2014) suggested a system of intelligent tutoring (ITS) based on the mastery acquisition technique.

The second subject dealt with the disadvantages and hazards. The attendees in the study feared that widespread use of AI would result in an overly mechanically way of thinking about data, a pragmatic approach, a greater emphasis on knowledge rather than aesthetically pleasing feelings, less room for educators ethical and security issues, and adverse social consequences in relationships. In the current situation, unchecked not appropriate or excessive use of cell phones appears to be causing behavioral, social, and emotional difficulties (Choliz, 2010). This could have been exacerbated by the unintentional introduction of AI into the lives of people and phones, as interviewees highlighted that mobile devices

have already deprived individuals of social contacts, and they are concerned about the next step in AI advancement in the world of cell phones.

Participants believe that there are going to be fewer slots in schools for instructors and more spots for robotics assistance. In line with these observations, Picciano (2019) claims that the bulk of individuals displaced would work in traditional white-coll and professional occupations such as instructing, law, medicine, and the business sector. A number of the most common concerns in communities regarding AI are the loss of employment. Picciano (2019) also suggests that compared to AI or robots replacing human labor, it will be individuals with the capacity to operate smart devices or machines with intelligence that will ultimately outnumber those who do not. Roll and Wylie (2016) assert that imparting knowledge in the current context might no longer be the same; consequently teachers ought to assume the positions of mentors, instruction their student's long-lasting abilities, interaction, breaking out of the norm, and emphasizing real life problems.

The third theme included the context of benefits involved with artificial intelligence. This subject is comparable to the previous one under solid results; however it is centered on services and uses. Respondents in the survey think that AI-powered systems will help contents keep up with learning speed, assist systems in better determining learner requirements, eliminate waste of precious resources and time, enable quick analysis of information, and inspire the correct decisions. A single participant, for example, found AI incredibly useful in that it might drive states to invest in relevant regions by forecasting population shifts. According to Subrahmanyam and Swathi (2018), employing AI-enabled anticipatory computing might learn about students' patterns and recommend the most effective study plan for them. The benefits of AI in education include coaching students towards mastery, repeating classes as needed, and swiftly generating a personalized instructional strategy for each student. According to Roll and Wylie (2016), pupils as well as instructors require more personalized support; hence, AI will better meet the requirements of learners and allow them to learn at the pace that suits them.

Participants' proposals for cautious models, supervision systems, and pre-analyzed processes for AI integration into learning environments are included in the fourth theme. On the technical and judicial levels, there should be several sorts of oversight. Participants called for the use of AI into personal affairs to be limited. AI in education should not be viewed as a panacea, but rather as a tool for simplifying and tightening up procedures in critical areas. Otherwise, artificial intelligence systems that mimic human intellect may cause legal issues. Some of these difficulties include who AI will report to, what responsibility those instruments will have, the intellectual property rights associated with artificial intelligence goods, privacy and security concerns. At this juncture, the legal framework should be modified to technological changes, and unique legislation involving AI tools should be established in the future based on robot or teaching assistants.

AI in education is full of exciting and intriguing possibilities for education. It is critical to handle new discoveries by thoroughly analyzing the background and consequences. Artificial intelligence innovations are an intriguing field for humanity; but, as those who participated in this study have revealed, it is not a panacea or a panacea that will bring ultimate benefit. As a result, the legal, ethical, educational, psychological, and social consequences must be evaluated. Because technology has the greatest impact on mankind, it is critical that every step of this procedure is carried out legally so that no individual is harmed.

The fifth finding in the current research is a generally optimistic attitude towards AI. The majority of the participants appear to be optimistic about AI. While teachers in the research believe AI is useful to education, scholars appear to disagree and concentrate on its less favorable elements. AI systems, according to experts in the area, are helpful since they will likely lead to complete functionality and eliminate faults in the systems, alleviating the burden of human labor. The overall both positive and negative view appears to be influenced by media, films, expert information, fear of future teaching careers, and real experience with present online systems.

Finally, this study gave a comprehensive educational patron view of artificial intelligence in schools and the educational sector. With the introduction of AI into schools, there will undoubtedly be related advantages, costs, and hazards. The majority of participants feel AI will provide new chances for students and learners that traditional classroom or educational technologies may not provide. However, there may be issues. Before the coming industrial revolution, schools must take a proactive attitude to their tasks. Policymakers ought to implement the recommendations in the literature to reap the many advantages of AI in the educational sphere.

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