ROLE OF ARTIFICIAL INTELLIGENCE IN HIGHER EDUCATION- AN EMPIRICAL INVESTIGATION

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ABSTRACT: *Artificial intelligence (AI) is gaining significance in all the sectors of the economy and hence in higher education too. From last few years, this concept of "Artificial Intelligence in Education (AIED)" has experienced significant developments. This study attempted to find out how the concept of artificial intelligence can be applied in teaching and learning in higher education and impacts of using AI in higher education. It examines the learning implications of frequently evolving technologies on the methods and extent of learning as well as teaching. AI gives opportunities to higher education services to become easily accessible at an extraordinary speed, not only inside the class but also outside the classroom. This report attempts to figure out the how AI can become an integral part of universities and tried to access it's immediate and future implications on different areas of higher education. The challenges in implementing AI in these institutes were also explored. This study will successfully deliver the profound information for educators and in depth knowledge for educational model building that will provide opportunities for growth in future.*

For the purpose of the study higher education institutes of Udaipur, Rajasthan will be taken. Structured questionnaires were framed and data collection is done with the help of them taking teachers perception as the focal point. To achieve the objectives of the study statistical tools that were applied for analysing the collected data are frequency tables/graphs and one way ANNOVA. Results of the study shows that implementing AI in higher education institutes is enhancing learning capacities of students up-to a large extent and AI holds massive future prospects in higher education sector.

Key Words: *Higher education, Technology, artificial intelligence, automation, Machine learning, teaching, student attributes.*

INTRODUCTION

The future of higher education is intrinsically linked with developments on new technologies and computing capacities of the new intelligent machines. In this field, advances in artificial intelligence open to new possibilities and challenges for teaching and learning in higher education, with the potential to fundamentally change governance and the internal architecture of institutions of higher educa- tion. With answers to the question of 'what is artificial intelligence' shaped by philosophical positions taken since Aristotle, there is little agreement on an ultim- atedefinitio The future of higher education is intrinsically linked with developments on new technologies and computing capacities of the new intelligent machines. In this field, advances in artificial intelligence open to new possibilities and challenges for teaching and learning in higher education, with the potential to fundamentally change governance and the internal architecture of institutions of higher educa- tion. With answers to the question of 'what is artificial intelligence' shaped by philosophical positions taken since Aristotle, there is little agreement on an ultim- atedefinitio Education undoubtedly plays a large and significant role for people residing in developing countries. Higher education institutes are playing an important role in a nation's development. Economic and social development of individual depends upon two important factors viz. Knowledge and learning. People who are highly educated are more likely to get high skilled jobs and compensation, hence have more probability to enhance their living standards. Thus people of developing country have more deep implications of higher education as education equips a person to live the life chosen by them to lead a creative and more productive live. Good Education and skilled students also leads to higher growth and improvement for the country as a whole particularly in developing countries. Thus in developing nation like India role of higher education becomes more prominent and hence the learning process should be optimized.

A technological revolution has taken place in most of the parts of recent world, in last few decades. Society has dramatically shifted from traditionally living conditions driven society to the present knowledge society where creativity and inventiveness drives the society. Earlier educational system was characterized where

teachers and students physically interacted in the classroom and majority of work is done manually in higher education institutes. But major technological developments in the last 20 years and mostly because of the Internet have changed people view of education and their working and a new concept that has evolved during the last few years is "artificial intelligence".

It's a well-known fact that higher education is heavily dependent on human and manual work. This not only increases the operational cost for the higher education institutes but also accounts for increase in the errors and slow processing in the field. Higher education institutes due to its labour intensive framework will have to spend a big budget on hiring and retaining educators and also in the processing of data in their institutes. Apart from financial loses in the form of salaries of highly qualified personnel's these institutes are also bearing increased amount of effort that institutions put into the admission, learning and success of all their students. Lot of information and efforts are being wasted in higher education institutes on repetitive tasks that can be minimized. Hence being a labour sensitive field it is facing both financial and physical loss. Thus adoption of artificial intelligence will bring a cheaper and more responsive approach to higher education industry.

Since 1956, we find different hypothetical understandings of artificial intelligence that are affected by "chemistry, biology, linguistics, mathematics, and the advancements of AI solutions". Notwithstanding, the assortment of definitions and understandings remains broadly contested. Most methodologies centre around constrained points of view on cognizance or basically disregard the political, mental, and philosophical parts of the idea of knowledge. With the end goal of our examination of the impact of artificial intelligence in teaching and learning in higher education, we propose a fundamental definition provided by the literature survey of some past definitions on this field. Subsequently, we can characterize artificial intelligence (AI) as automated frameworks that can take part in human-like procedures, for example, "learning, adapting, synthesizing, self-correction and use of data for complex processing tasks".

WHAT IS ARTIFICIAL INTELLIGENCE?

Artificial intelligence (AI) is the impersonation of human knowledge procedures, for example, discourse and visual acknowledgment, interpretation of the dialects and virtual decision making by machines and robots. The capacity of machine to think and act like people, has given AI an extraordinary place in all fields. Artificial intelligence is available wherever in different parts of our lives beginning from smart sensors to individual associates.

Recent developments in AI have gotten numerous enormous changes in the higher education field. "Artificial intelligence helps students and teachers to make their educational experience wonderful".

Artificial intelligence (AI) is characterized as the capacity and improvement of a data innovation based PC frameworks or different machines to finish the jobs that typically require human knowledge and rational thinking. Despite the fact that AI can make the world a superior spot, AI accompanies its very own issues (Siau, 2018). Take the case of driverless vehicles. Driverless vehicles open another time of innovation progression in transportation. It carries colossal advantage to both the vehicle business and the clients from both financial and reasonable viewpoints. The use of driverless vehicles liberates the drivers from the ordinary assignment of driving and decreases mishap rates (e.g., weariness driving). By and by, driverless vehicles will supplant taxi, truck, and Uber drivers!

Artificial intelligence is presently advancing at a quickened pace, and this as of now impacts on the significant idea of administrations inside advanced education. For example, "universities already use an incipient form of artificial intelligence, IBM's supercomputer Watson. This solution provides student advice for Deakin University in Australia at any time of day throughout 365 days of the year **(Deakin University 2014)".** Regardless of whether it depends on calculations appropriate to satisfy dull and moderately unsurprising assignments, Watson's utilization is a case of future effect of AI on the managerial workforce profile in advanced education. This is changing the structure for the nature of administrations, the dynamic of time inside the college, and the structure of its workforce. A super-PC ready to give bespoke input at any hour is lessening the need to utilize a similar number of managerial staff already serving this capacity. In this regard, it is likewise essential to take note of that machine learning is a promising field of artificial intelligence. While some AI arrangements stay subject to programming, some have an inbuilt ability to learn examples and make expectations. "An example is Alpha Go—a software developed by Deep Mind, the AI branch of Google's—that was able to defeat the world's best player at Go, a very complex board game **(Gibney 2017)".** We characterize 'machine learning' as a subfield of artificial intelligence that incorporates programming ready to perceive designs, make forecasts, and apply the newfound examples to circumstances that were excluded or secured by their underlying plan.

ROLE OF ARTIFICIAL INTELLIGENCE IN EDUCATION

Many research works demonstrate that in higher education, artificial intelligence is important for teachers and students because application of such technologies encourages more flexible learning solutions for students without any limitation. With the help of artificial intelligence universities around the world are enrolling increased number of students due to increased flexibility and speed. However, its implementation in teaching has also proven relatively expensive but when compared with the other manual work related costs it comes out as economical. Though, use of artificial intelligence in the long run among college students is far more cost effective compared to education being conducted in a more traditional way and tasks done manually. Developed countries of the world have already implemented the process of artificial intelligence successfully. However developing countries are still at a preliminary stage compared to developed countries in artificial intelligence implementation. Weak infrastructure, poor information access, lack of support from institutes, insufficient necessary resources, poor technological skills, these are various obstacles for developing countries wanting to implement artificial intelligence as a tool in higher education.

AI is used in education system in grading, in this process teachers can mechanize grading of students for certain fixed set of questions. AI can also be applied in adaptive and individualized learning to fulfill students requirements. AI assists the teachers to access the understanding capacity of the students on their lectures and empower them to give the appropriate clues for students. It works as a teacher for the students and makes them learn concepts easily.

Artificial intelligence driven projects provide supportive input for the both students and educators. It causes the instructors to screen the performance of the students and empower them improve the guidance that they give for the students. AI frameworks in schools have changed the manner in which students find and cooperate with coordinated innovation. This has an impact to change educators as facilitators by giving students intuitive learning knowledge. Students can learn by the experimentation strategy without fear as AI bolsters in their learning and give help to their improvement. AI frameworks procured information will change the manner in which the schools discover, instruct and bolster understudies. In fact at some places it may even supplant educators in certain situations. It has turned into a learning buddy the helps students in their learning procedure (Sharma c.).

Artificial Intelligence (AI) creates an encouraging environment, especially, can provide a favorable context for students learning characteristics and process. Artificial intelligence consists of all forms of electronically reinforced learning, processing and teaching. The easy and flexible structure of these AI influenced environments empowers learners to accommodate their personal needs in their own time learning. Thus we can say that AI is a well-designed tool that offers a flexible arrangement, collaboration opportunities, and options and control over learning process that can provide learners and teachers with the opportunity to pursue learning process effectively. Also, in AI in higher education institutes is the responsibility of tutors. Using AI teachers can create a learning environment that permits the students to develop a better understanding of content and build associations with instructors and students.

Entire globe has completely digitalized. Education has definitely been influenced by the digital world. The fast paced technology provides individuals in the area to training and learning with unlimited possibilities. With the global interest in computers, artificial intelligencehas been focused in learning environment. ThisAI presents different functions for academic surroundings. Computers have potential advantages to both the instructors and the students. With the arrival of the computer, AI is playing an important role in the higher education institutes. Plenty of programs have been created for various fields or professional classes. The conventional teaching and learning methods usually lack efficient methods of explaining an intuitional and clear material, while AI can make up through the use of new software and hardware methods. From the viewpoint of AI program, there is more scope in teaching in the classroom compared to other mere learning methods. Thus, the emphasis is given on adopting AI in the classroom as well as outside classroom.

CHALLENGES FOR ARTIFICIAL INTELLIGENCE IN EDUCATION:-

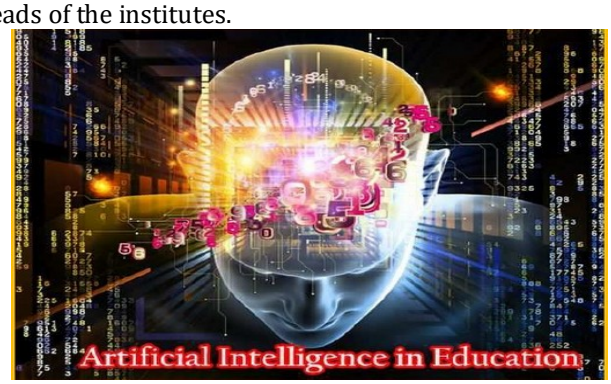
"Major challenges for artificial intelligence in Education as proposed by **Woolf, et al., (2013)"** incorporates virtual coaches for each student in which inescapable help that coordinates user displaying, social reenactment and information portrayal, helps students with self-heading, self-evaluation, collaboration and then some, unite the tremendous measures of information about individual learning, social settings, learning settings and individual interests, increment the inter connectedness and openness of classrooms worldwide and taking learning outside of the study hall and into the student life outside of school. The job that Artificial intelligence plays in advanced digital world is wonderful and it is relied upon to propel learning knowledge increasingly more sooner in the near future. (Sharma c.)

As already discussed there are numerous benefits of artificial intelligence for teachers, students and institutes, the possibilities of AI are also impressive. Yet there are few challenges also that higher education

institutes are expected to face at the time of adopting artificial intelligence in their universities. Few of them are given below;

- Authorization and economic support should always be a constraint for the updated academic achievement and instructional support given by AI.
- Privacy regulations are also a big constraint as it always required to be updated with the intention of addressing the ability of AI frameworks to track information and makes use of it for analytical study.
- Interfacing with students is another constraint. In the event that AI assumes few current job duties, for example, evaluating and responding to students inquiries, directors and employees will most likely move their concentration to answering complex issues and interfacing with students on more profound dimensions.

To address the opportunities and difficulties introduced by AI adoption in the advanced education segment, we urge establishments to look at "(a) when to implement AI (short- or long-term), (b) in what fields of the institution AI would be of big helpful, (c) how to shield students' privacy at the time of using data to help them, and (d) what the university's definition of success is with respect to AI implementation". Artificial intelligence can open up tremendous new conceivable outcomes for advanced higher education, and establishments that set aside the effort to incorporate it well will appreciate the advantages it brings to students, educators, and heads of the institutes.



LITERATURE REVIEW

Artificial Intelligence (AI)

Artificial intelligence (AI) can be categorized into two categories viz. Weak and Strong AI. Let us discuss both of them briefly;

1. Weak AI: It is also called as artificial narrow intelligence, is intended to be centered on a restricted job. One case of Weak AI is self- driving vehicle. It is meant for a particular job.
2. Strong AI: It is also known by the name of artificial general intelligence as opposed to weak AI. Strong AI is able to do most (if not every single) mental functions that a human may have and can apply intelligence to more than one explicit issue (Kurzweil, 2010; Voss, 2017). Strong AI is considered by numerous famous specialists and industrialists, for example, "Stephen Hawking, Bill Gates, and Elon Musk as an existential threat to human development".

AI Effects on Higher Education

With the job substitutions and relocations created by AI, future job market and required ranges of skills would be fundamentally unique in relation to now (Siau, 2017, 2018; Rainie and Anderson,). Various examinations revealed that jobs that include routine tasks and organized are simpler to computerize and will be supplanted by AI soon. Despite what might be expected, work assignments that are progressively unstructured and included overseeing individuals are harder to be supplanted by AI. Advanced education should be versatile and develop ceaselessly.

Advanced education will be affected by AI from numerous points of view and the two noteworthy territories are educational programs and admissions. To begin with, AI will sweepingly affect educational plan in advanced education. The quality of AI is its speed, precision, and consistency. It is an act of futility to contend with AI on these measurements. Then again, AI is as yet feeble in delicate expertise, for example, "creativity, innovation, critical-thinking, problem-solving, socializing, leadership, empathy, collaboration, and communication". It is not necessarily the case that we ought to overlook the hard skills, for example, "science, math, and engineering". Advanced education should even now train the students in the basics of

science and math, and in the meantime gives opportunities and training to students to upgrade their delicate abilities. A few colleges are as of now offering AI and Machine Learning courses to software engineering students, yet additionally business students as business managers and officials need to comprehend the abilities, constraints, and ramifications of AI in the business world.

The other effect of AI in advanced education is admissions. Aesthetic sciences and humanities majors may turn out to be increasingly well known as these zones are less susceptible to "AI-invasion." Areas, for example, bookkeeping and budgetary investigation that might be hit hard by AI may see an intense drop in admissions. Likewise, with the wealth gap and conceivably millions (if not billions) out of occupations, advanced education may never again be reasonably priced to many.

OBJECTIVE OF THE STUDY

- ✓ To study the impact of animation (artificial intelligence) on learning of students.
- ✓ To find out the relationship between demographic variables of respondents and AI impact on learning.

RESEARCH METHODOLOGY

For the purpose of the study higher education institutes of Udaipur, Rajasthan will be taken. Structured questionnaires were framed and data collection is done with the help of them taking teachers perception as the focal point. To achieve the objectives of the study statistical tools that were applied for analysing the collected data are frequency tables/graphs and one way ANNOVA. Data collection is done through both primary and secondary data collection method.

For finding out the significance of impact of animation of different genders groups on learning of students the following hypotheses have been established and tested;

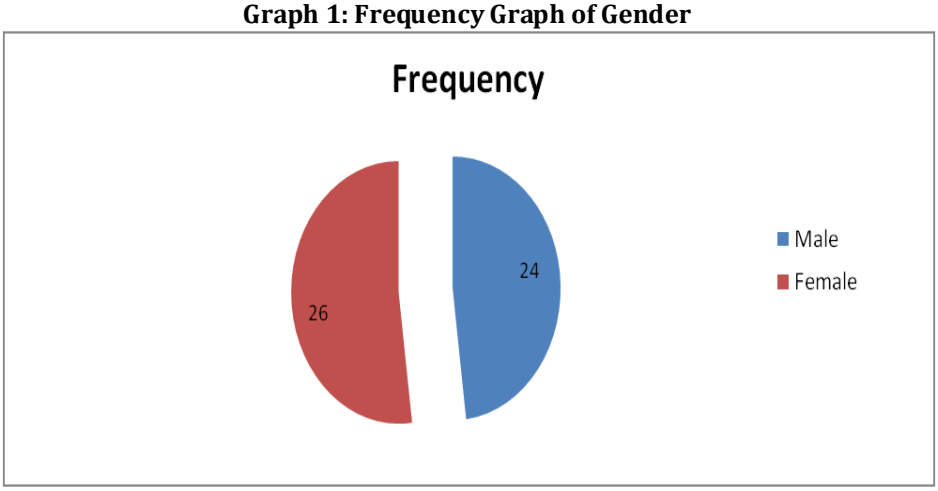
H_{01}:- There is no significant difference between the male & female teachers perspective about the **impact** of AI on the learning of students.

H_{11}:- There is a significant difference between the male & female teachers perspective about the **impact** of AI on the learning of students.

Table 1: Frequency Table of Gender of teachers

Gender					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	Male	24	48	48	48
	Female	26	52	52	100
	Total	50	100	100	

Graph 1: Frequency Graph of Gender



Source: Primary Data

According to Table 1 and Graph 1when respondents were classified on the basis of teachers gender it was found that out of total 50 respondents 24 (48%) were male and remaining 26(52%) were females. This shows that colleges under consideration possess almost equal male and female ratio and also graph

indicates that the females' number is higher than male teacher respondents in colleges as education is the only sector where majority of females prefer to work due to its working hour flexibility.

Table 2: Test of Homogeneity of Variances of Gender and impact of animation

Test of Homogeneity of Variances			
Gender			
Levene Statistic	df1	df2	Sig.
13.905	4	45	.000

Levene's Test for Equality of Variance is performed to test condition that the variances of both samples are equal or not. A high-value results normally in a significant difference and a low-value result normally in a non-significant. The results from **Table 2** present that demographic variable Gender has value as (0.000).

Table 3: ANOVA table of Gender and impact of animation

ANOVA					
Gender					
	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.718	4	.179	.710	.586
Within Groups	49.277	45	.253		
Total	49.995	49			

According to **Table 3,** the significant value of **Gender (0.586)** is greater than 0.05 so we accept the null hypothesis that there is no significant difference between the male & female teacher's perspective about the **impact** of AI on the learning of students. This deciphers that both the gender male and female groups of teachers hold same perception regarding the impact of AI on learning.

S. No.	Hypotheses	Difference	Status
4.	H_{04}	Non Significant	Accepted

This deciphers that both the gender male and female groups of teachers agree over the fact that AI is significantly impacting the students learning in higher education institutes.

CONCLUSION

In conclusion, this research reveals the Students Perception on "study the perspectives of the teachers about learning through AI with special reference to the selected universities of Rajasthan" which helped in further inspecting the role of various modern artificial intelligence methods adopted by universities in successfully enhancing the learning capability. The study also reveals that though the future prospects of artificial intelligence in higher education institutes are very high and it holds lot of possibilities in this field,But the present state of AI in higher education institutes is demanding rigorous investment in terms of funding and time. Thus Institutions that are planning to adopt AI are required to consider a wide variety of factors just to make sure that adoption of AI will become a turning point in their learning methodology to be sure that it will benefit students, teachers as well as the institutes.

Adoption and implementation of AI in higher education is late in comparison to the corporate sector, many companies that have already adopted artificial intelligence and are continuing to invest more into AI applications will surely remain ahead of their competitors. Higher education institutes that incorporate AI into all of its programs remain leaders in their field and are already reaping the benefits associated with it.At the end from all the discussion and analysis done in the paper we can now say that AI is impacting higher education institutes in a significant way. AI expansion is forcing many jobsto become obsolete and thus an entire new skill sets will be required. Higher education institutes are required to train and develop their students to upgrade them to face the challenge of the AI revolution and fight successfully in the AI age.

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