Artificial Intelligence Aided Physics Teaching (An Experimental Study on the Development of Artificial Intelligence in Teaching Physics at the School level)

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Abstract- *Students like to study Physics when there is creative approach. My teaching experience the students also tells a student doesn't like to read lengthy lessons and theories. So, it is a strong belief that as far as possible discovery and experimental method with gadgets to be done. So, my experimental study is on the development of Artificial Intelligence Aided Teaching of Physics.*

After dividing the 9th and 10th standard students in to 2 groups of mixed abilities such as high achiever, mediocre and low achiever, provided the traditional group with questionnaire in Physics concepts which they have to solve by pen and paper without using any technology aids.

Experimental group was provided with Artificial Intelligence aids such as Google assistant, Navigation app, Chatbots, Text editor and auto correct, Face recognition apps.

When the analysis of the answers provided by the control group and the experimental group, it was noticed that the answers provided by experimental group was more practical and having realistic life experiences. The A I aid they have used to learn and answer the physics questions helped them to be more research oriented and to get the precision in defending their answers.

Key Words: Artificial Intelligence, Teaching-Learning Aid, Google Assistant, A.I Assistant/Competitor/Friend.

Introduction

We all know, of course, how amazing the progress has been in A I in recent years. So, if all this progress is happening how can it be used to help to study Physics? In a lot of ways. Obviously, for example, we have machine learning used to detect Newton's third law of motion. It can be used to detect extrasolar planets and in various technological advances. Machine learning can be used to analyze data computation of moving objects in multi-dimensional fields.

Objectives

1. To study the impact of Artificial Intelligence in the field of teaching and learning Physics.
2. To compare the A.I aided teaching with the traditional method of Teaching Physics.
3. To facilitate children to learn Physics with the help of Artificial Intelligence.
4. To amalgamate the A. I into real life experience of Students and also to develop an I as a co-learner and competitor/friend to the students in studies.
5. To discourage classroom chalk and talk methods and shifting on A.I aided teaching of Physics.

Hypothesis

After reviewing how machine learning is becoming ever more widely used in physics, a thought came to explore how Artificial intelligence can help to learn physics for students. In a set up where A I aid was given to the students and traditional group was created. Hypothesis was that Artificial Intelligence aided learning can give better results in terms of real time calculations in realistic set up in the current scenario. It gives practical answers and caters to the needs of the 21st century learners.

Methods & Procedures

In order to carry out the project, 9th and 10th standard students were divided in to 2 groups. Both groups contained students of mixed abilities such as high achiever, mediocre and low achievers. Grouping was done by considering their academic achievement of 2 consecutive years.

One group was the control group and the other experimental group. Traditional group was provided with questionnaire in Physics concepts which they had to solve by pen and paper without using any technology aids. Data provided to them were Distance between two cities, Formulae, Definitions and Examples. Also certain materials like graph sheets, pen, paper and formulae list.

In fact, experimental group was with Artificial Intelligence aids such as Google assistant, Navigation app, Chatbots, Text editor and auto correct, Face recognition apps. Questionnaire contained following questions.

(1) Calculate the time required to travel from Ajmer to New Delhi?
(2) Why do the stars twinkle whereas planets don't twinkle?
(3) If you want to wear a goggle what is the best suitable goggle in dimensions you must have?
(4) Draw the V/I graph characteristics of Ohm's law and analyze the data.

S.No	Question Numbers	Answer and Accuracy in answers of A.I aided Group	Answer and Accuracy in answers of Traditional Group
1	1	387 Km (6hr 40min) 99%	400Km (7hr 30min) 60%
2	2	Point source objects 91%	71%
3	3	Using Face recognition app 99%	Traditional method 62%
4	4	Using computer and Geo-gebra82%	Using graph paper and pencil 55%

Results & Discussions

When the analysis of the answers provided by the control group and the experimental group was done, it was observed that a greater number of students scored better marks in the experimental group. 50% of traditional group students were not able to get the correct answers to most of the questions. Learning outcomes of experimental group was far better in terms of 21st century skills such as Collaboration, Communication, Creativity, Critical Thinking, and Computational Thinking. It was also noticed that the answers provided by experimental group were more practical and having realistic life experiences. The AI aid they used to learn and answer the physics questions helped them to be more research oriented and to get the precision in defending their answers.

Implications of the study

Artificial Intelligence aided physics learning will be more effective for students to improve their skills and to do the precise calculations. It will be good friend to explore and do research in the various branches of physics. It is found that A I help slow learners to understand the physics concepts better like a Teaching Learning Aid.

Artificial Intelligence will definitely cause workforce to evolve. The job loss is seen as great threat to humanity but the positive side is A I can create thousands of new jobs in the future.

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A T L Tinkering Labs.