TEACHERS REFLECTIVE PERCEPTION ON ARTIFICIAL INTELLIGENCE INTEGRATED SCIENCE LESSON PLAN

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Abstract

This study aims to disclose how artificial intelligence (AI) has been applied in the fields of education bringing the enhancement by inculcating the regular lesson plan with AI tools. This study will help to explore how AI integrated lesson plans will help the students to develop their cognitive ability and motor skills. AI integrated lesson plans are the initiative by the collaboration of the Central Board of Secondary Education (CBSE) and Intel to boost up the teaching-learning process by stepping up with the latest intensive technology. Here in this research paper, the researcher has prepared a lesson plan using the template and idea from CBSE integrated AI lesson plans for the eighth class on the science topic 'Microorganism'. The lesson plan was just an idea to make teachers aware of how AI can be integrated into our lesson plan to make the teaching and learning process more effective. The lesson plan was shared with the teachers to gather their views and reflection on the AI integrated lesson plans. The sample size for the present study was 20 teachers as participants and the questionnaire involved 12 survey questions on how AI integrated lesson plans will be helpful for students. The conclusion was way positive than assumed and teachers appreciated the recent trend brought in by the AI integrated tool in the regular classroom making the learning more interesting and creative.

Keywords: Artificial Intelligence, Lesson Plans, Science curriculum, Teaching-learning process, AI tools.

INTRODUCTION

"We're headed for a world where you're either going to be able to write algorithms … or be replaced by algorithms." —Bridgewater hedge-fund billionaire Ray Dalio

According to Ed Burns, AI is the replication of human intelligence processes by machines, especially computer systems. Specific applications of AI include expert systems, natural language processing, speech recognition and machine learning.

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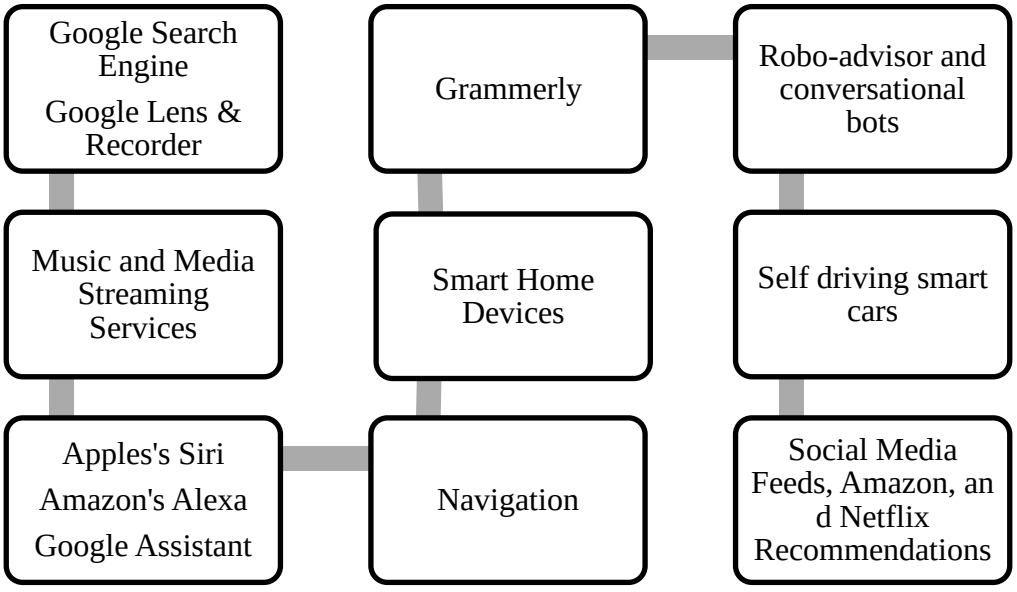
According to Coppin, AI is the ability of machines to adapt to new situations, deal with emerging situations, solve problems, answer questions, devise plans, and perform various other functions that require some level of intelligence typically evident in human beings.

AI core is based on the algorithm. The distinction between AI algorithms and computer programs is that they entail some specific approaches which are applied to areas we might think of as essentially human such as visual perception, decision-making, speech recognition, and learning.

The prevalence of Artificial Intelligence has been around us every now and then. As nowadays we are more into the technological era of having electronic gadgets like smartphones, laptops, Alexa, etc. with us every time, there are applications in these gadgets which are based on the concept of artificial intelligence.

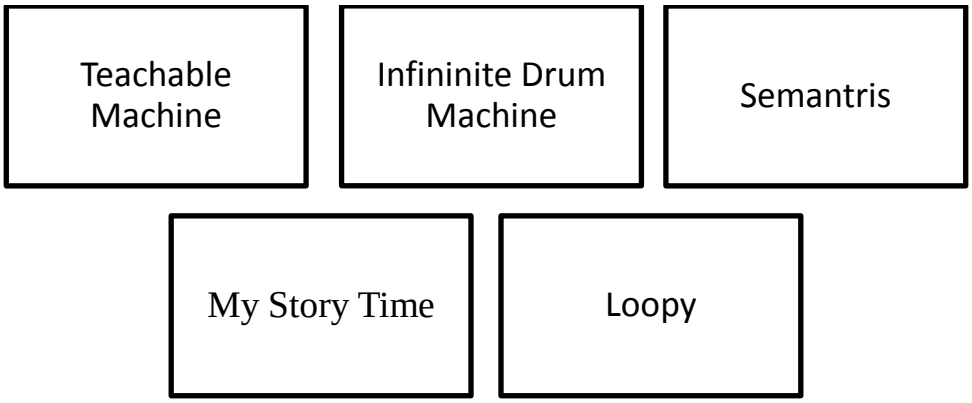
For example, we think YouTube knows us better when it starts suggesting what we would like to watch the next after searching for our favorite video. Right? This concept of suggestions about what we like from our previous history of videos we watched and enjoyed is based on the artificial intelligence of the machine.

Similarly, we are surrounded by applications of artificial intelligence and serve a dominant role in our daily life. Some of the examples are depicted below.



Artificial Intelligence (AI) is the current trend in education. Education has been always a field of continuous development where the need to make the teaching-learning process very effective. There was a drift from adopting traditional methods of the teaching-learning process to audio-visual aids to enhance the teaching-learning process. This drift was a success as many students took interest in learning where they can observe how things look like, how are they formed, what's the relevance of studying it here and how they work. Students came out from the books a little and started to gain abstract knowledge of the concept they are studying. Now, students are entering into the field of technology very much from where they are gaining a lot amount of knowledge to make a strong conceptual clarity. There enters artificial intelligence as an emerging trend to intensify the 'learning by doing method of learning where students can now learn experimenting and exploring their subject content using artificial intelligence tools. Artificial intelligence is probing to make large courses more intimate and interactive. Hence, we can say AI in education will help students to explore more into the content they are learning and gain a conceptual clarity of what they are learning enhancing their cognitive and motor skills. The AI in Educations is intended to bring Creativity, Learning by doing, Machine interaction, Conceptual clarity and Exploration in students.

Likewise, we have different applications in our smartphones for various purposes; there is a variety of tools based on artificial intelligence which acts as a supporting system of various aspects. Through AI tools one can conduct experiments and create a model based on machine learning. Some of the AI tools are designed without any coding functions and can be used by anyone. These AI-based tools are used in the field of education to use the feature of machine learning to explore various concepts with experimentation. It boosts the student's creativity level as they use their cognitive skills to understand a concept. There are a lot of AI tools as an experiment from the google team and creators from around the globe. The table below mentions some of the AI tools which can be integrated as an instructional aide in the classrooms.



Artificial Intelligence Integrated Lesson Plan

A lesson plan is developed by a teacher which is a blueprint of the course of instruction that needs to be delivered in the classroom for the teaching-learning process on the daily basis for every subject.

A lesson plan helps a teacher to guide through the procedure that needs to be carried out in a classroom. It contains a detailed map of how to initiate with the topic followed by the previous knowledge testing and the breakdown of the topics into chunks for better understanding of students along with the terminal recapitulation. It also involves which instructional aid or teaching methods need to be involved for a specific topic.

An AI integrated lesson plan follows the path of a regular lesson plan but the association of computers is mandatory. The AI integrated lesson plans mainly collaborate with the AI tools. There are various models based on artificial intelligence which can be used as an instructional aide to facilitate the teaching-learning process.

RATIONALE OF THE STUDY

The trend of data and machine learning has expedited the growth of AI in the field of education. Following which the usage of AI technology in the field of education is transforming the learning outcome of students. Various tools related to artificial intelligence has created by google and various researcher as an experiment has caught the eye of teacher's and education facilitators to use this technology in the field of education, particularly in the curriculum. Science, being a subject, which requires more 'learning by doing' approach rather than theory, integrates

technology as the prominent part of this subject. AI being one of the recent trends in technology is grasping the roots in science curriculum to make it more interesting. There is need to widespread AI based tools in the science lesson plans to enhance the student's creativity and learning outcome. In this case, teachers' reflective perception towards the artificial intelligence integrated curriculum will influence its acceptance and will further help to support the education to enhance the student's learning outcome and nurture their creativity. As there is no previous research done on the AI integrated lesson plan, this study will bridge the gap. The present study will contribute to the field of education by revealing the teacher's perception towards AI integrated science lesson plan.

STATEMENT OF THE PROBLEM

Teachers Reflective Perception on Artificial Intelligence Integrated Science Lesson Plan

OBJECTIVE OF THE STUDY

a) To study Teachers' adaptability towards Artificial Intelligence integrated lesson plans.
b) To study Teachers' reflective perception on students' enhancement of cognitive and motor skills.

DELIMITATION OF THE STUDY

a) The study is limited to the teacher's teaching in urban schools.
b) The study is limited to the teacher's teaching science subject.
c) The study is limited to teacher's teaching at the elementary level.

METHODOLOGY

The present study entails the descriptive method of research. A set of questionnaires was prepared by the research which includes 12 questions based on the lesson plan shared with them which will help us to collect the view and reflection of teachers on the current trend of AI integrated lesson plans.

SAMPLE

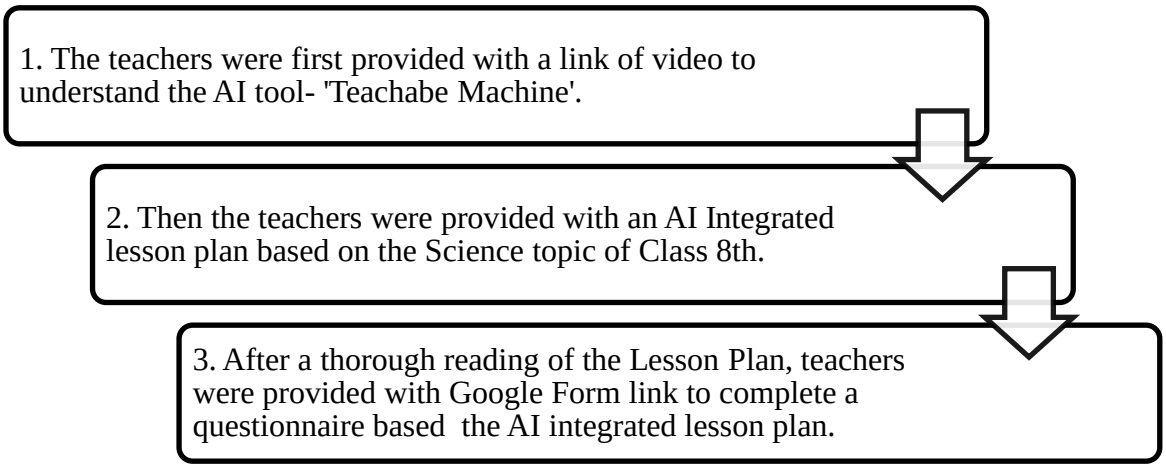
The purposive sampling method was adopted for the present study. The data was collected from 20 teachers teaching Science at the Elementary level. The region for data collection remains confined to schools of Chandigarh, Mohali, Panchkula and Delhi.

TOOLS

A self-made questionnaire was prepared by the researcher. It contains 12 questions based on the lesson plan provided to them. For the assessment of the questionnaire, a five-point Likert scale was used with Strongly Agree, Agree, Neutral, Disagree and Strongly Disagree pointers.

PROCEDURE

The below steps were followed by the participants:



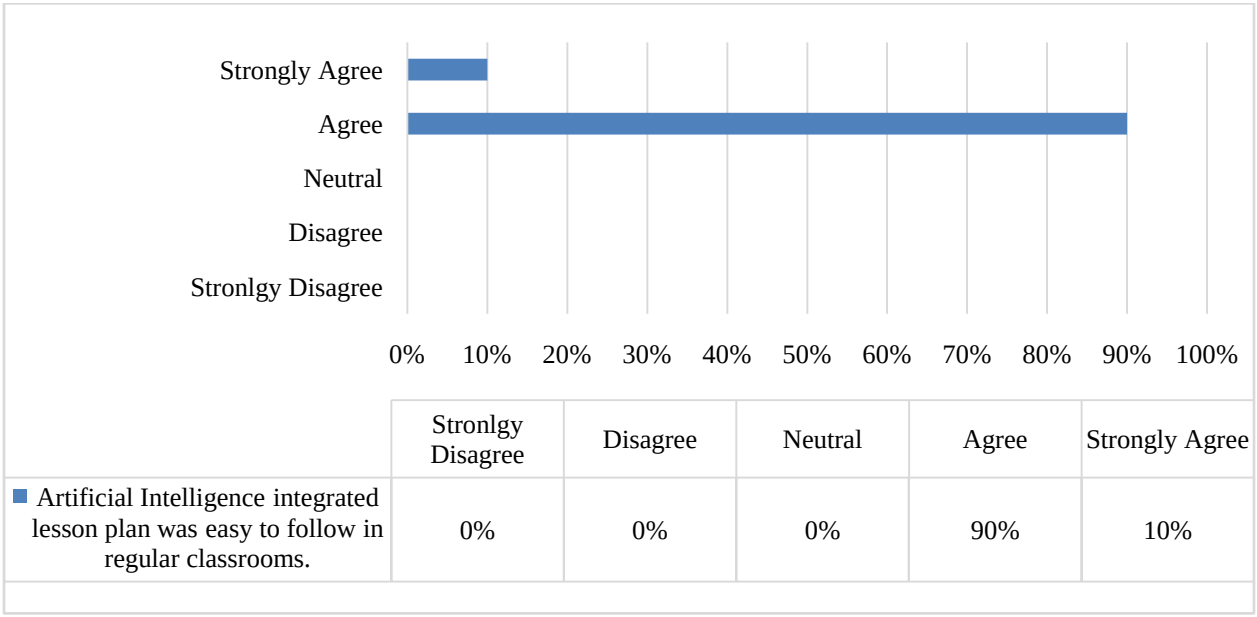
The word document containing all the steps were mentioned briefly and sent to teachers through WhatsApp and Gmail. The responses were recorded in Google form.

RESULT ANALYSIS AND DISCUSSION

In the present study, the main focus was to grab the reflection of the teachers about how AI integrated lesson plans and how it is going to impact the students learning. For this purpose, a questionnaire was prepared. The responses collected were analyzed and interpreted as under:

1. According to the collected responses, 90% of the teachers '**Agreed'** and found AI integrated lesson plan was easy to follow in the regular classroom. Teachers are equipped with technological skills and teaching in smart classrooms, so they found it easy to inculcate the AI tools as a part of their lesson plan in a regular classroom.

Table 1: Teacher's reflection on accessibility of Artificial Intelligence integrated lesson plan in regular classrooms.



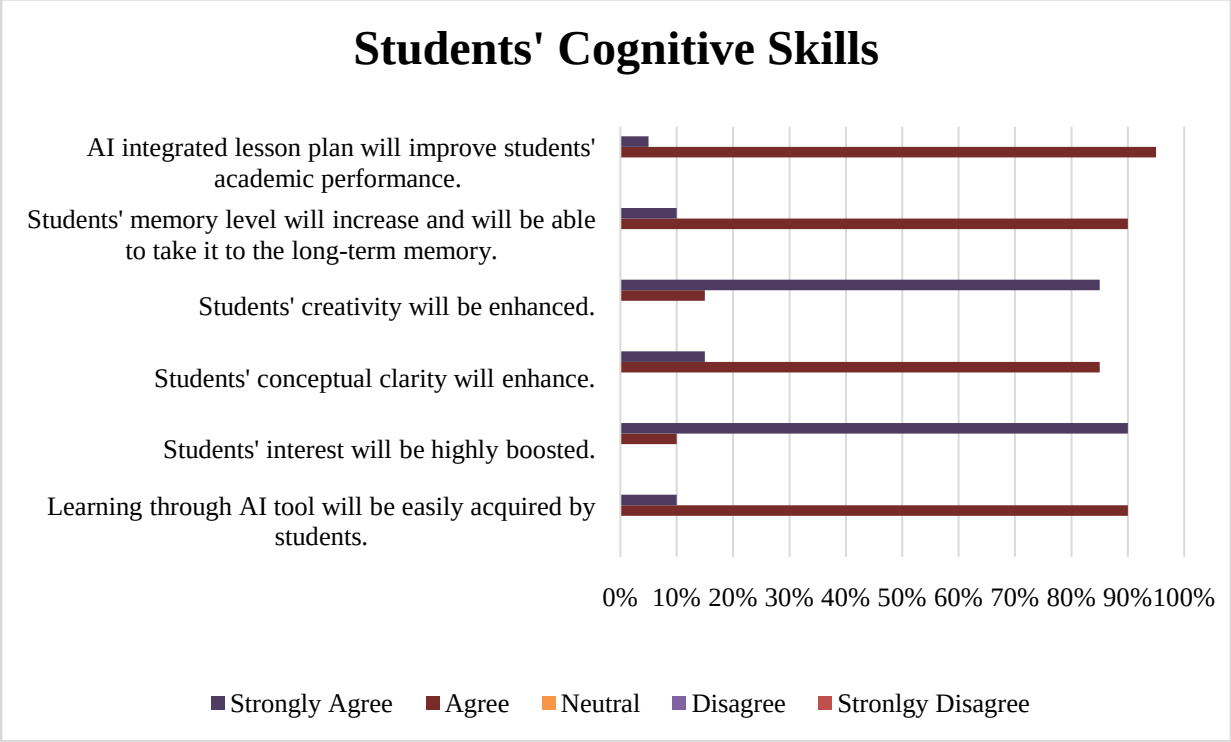
	Stronlgy Disagree	Disagree	Neutral	Agree	Strongly Agree
Artificial Intelligence integrated lesson plan was easy to follow in regular classrooms.	0%	0%	0%	90%	10%

2. Below are the teacher's responses related to students' cognitive skills:

- According to the collected responses, 90% teachers '**Agreed'** to the statement that learning through AI tools will be easily acquired by students.
- According to the collected responses, 90% teachers '**Strongly Agreed'** to the statement that students' interest will be highly boosted.
- According to the collected responses, 85% teachers '**Strongly Agreed'** to the statement that students' conceptual clarity will be enhanced.
- According to the collected responses, 90% teachers '**Strongly Agreed'** to the statement that students' creativity will be enhanced.

- According to the collected responses, 90% teachers '**Agreed'** to the statement that students' memory level will increase and will be able to take it to the long-term memory.
- According to the collected responses, 95% teachers '**Agreed'** to the statement that AI integrated lesson plan will improve students' academic performance.

Table 2: Teacher's reflection of impact of AI integrated lesson plan on students' Cognitive skills.



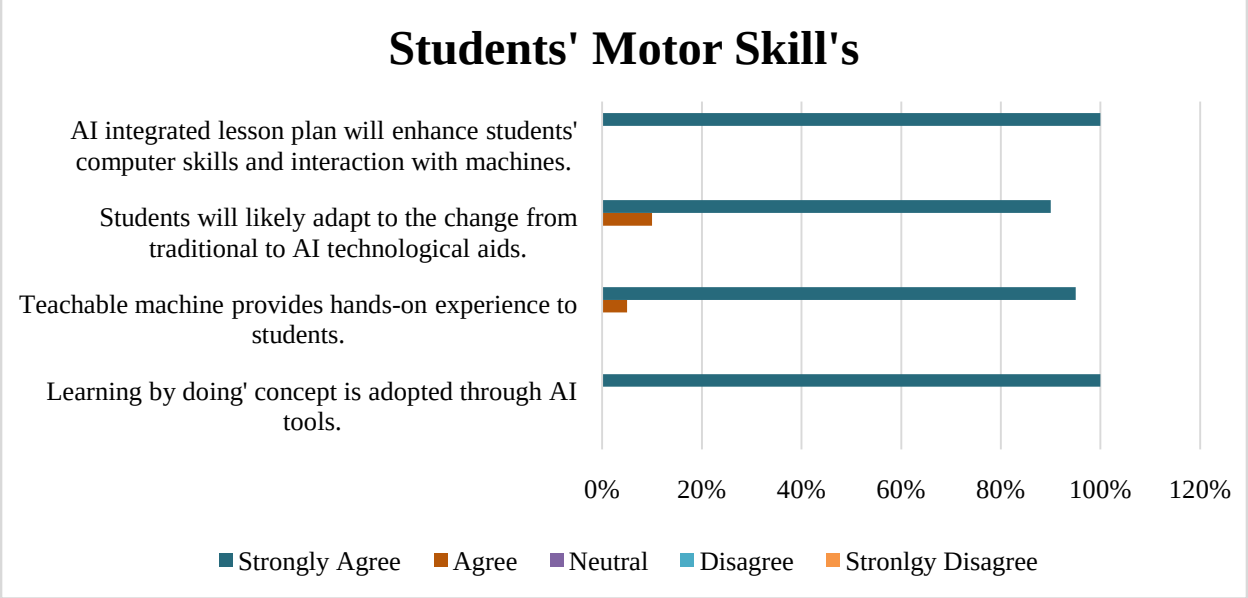
Students are nowadays more tech-savvy and are interested to learn through computer-assisted learning and computer-based learning. So, students will be interested to sway from the book and gain knowledge through the exposure of AI tools. The above questions fall under the cognitive domain of students and teachers reviewed that student are more likely to adapt to recent trends more if it is related to technology. The AI tools used for the current lesson plan involve teachable machines which make the students learn through the process of model based on image recognition. Science as a curriculum boost up the interest of students when it is brought under the learning through experimentation method and AI integrated lesson plan evolved to be

learning through experimentation. This experimentation will help students to learn most of the content through visual recognition of the experiments.

3. Below are the teacher's responses related to student's motor skills:

- According to the collected responses, 100% teachers '**Strongly Agreed'** to the statement that 'Learning by doing' concept is adopted through AI tools.
- According to the collected responses, 95% teachers '**Strongly Agreed'** to the statement that Teachable machine provides hands-on experience to students.
- According to the collected responses, 90% teachers '**Strongly Agreed'** to the statement that students will likely adapt to the change from traditional to AI technological aids.
- According to the collected responses, 100% teachers '**Strongly Agreed'** to the statement that AI integrated lesson plan will enhance students' computer skills and interaction with machines.

Table 3: Teacher's reflection of impact of AI integrated lesson plan on students' Motor skills.

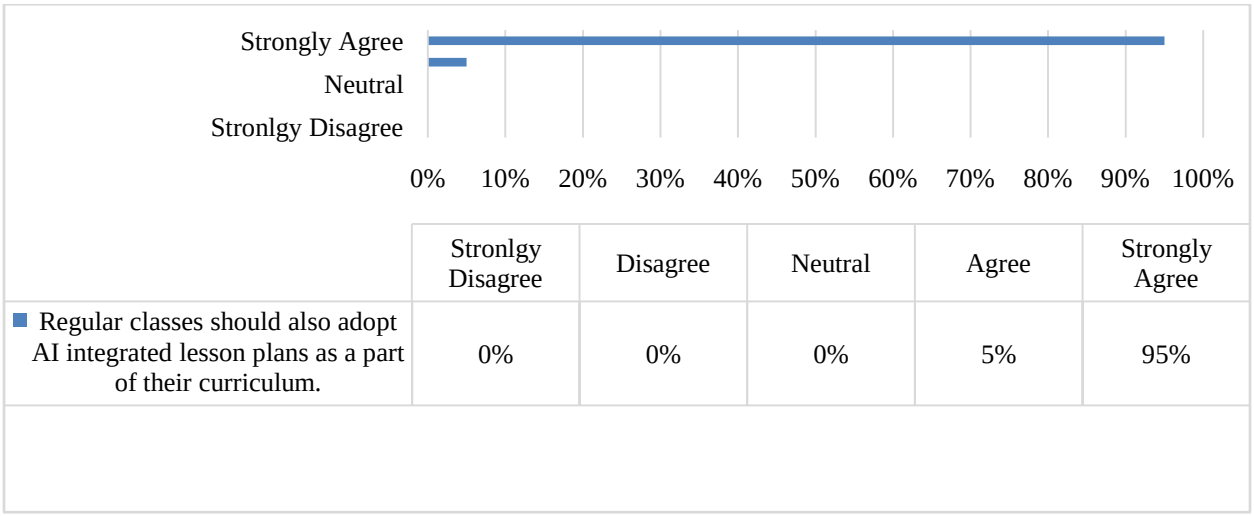


Students have endorsed technology-based electronic gadgets and have most of the knowledge about how technology works. So, learners will be in favor of the shift from traditional to technological aids. It will boost up the student's interest in learning. The student's practical

knowledge gained by doing the experiments and getting in-depth exposure to the content on their own will enhance their motor and computer skills. Students understanding capacity improves when they perform and explore the content of the curriculum by doing on their own and learning becomes interesting.

4. According to the collected responses, 95% of the teachers 'Agreed' that AI integrated lesson plans should be adopted as a part of their curriculum. Teachers are also in search of finding new and innovative ways to boost up the student's interest and creativity by adopting something new and different methods related to their concepts. So, AI integrated lesson plans will be swift to involve in a regular classroom to gain students' attention and enhance the teaching-learning process.

Table 4: Teacher's reflection on adaptability of Artificial Intelligence integrated lesson plan in curriculum



	Stronlgy Disagree	Disagree	Neutral	Agree	Strongly Agree
Regular classes should also adopt AI integrated lesson plans as a part of their curriculum.	0%	0%	0%	5%	95%

CONCLUSION

Nothing is constant in this world, but change is constant. This proverb has been the core of education as the trends in education are arising with the advancement of technology. The more the technology grows, the more we have to shift our education system towards the recent trend to keep our children up to date according to their generation where they can find comfort and adapt themselves to learn in the new environment with the latest instructional aides. The present study

results indicate that the teachers found AI integrated lesson plans are easy to adopt in the regular classroom. Moreover, AI integrated learning environment has a positive impact on the cognitive and motor skills of students. Students are inclined to learn those science concepts which considered being least interested. Along with the improvement in the academic achievement of the students, AI integrated learning is making students tech-savvy and technologically skilled. Appropriate use of AI tools and techniques in the curriculum will be proved as a successful trend in education. Artificial Intelligence used in the educational domain will help to strengthen the practical and theoretical foundation of AI in education. In addition to that, it will prove helpful for teachers and students to develop insight and knowledge. Even though the AI concept is trending worldwide, it already evaded itself deeply in the education system. Teacher's being the strongest pillar of the education is trying their best to inculcate the improved quality education in the children so as to make them gain the maximum knowledge. And according to this research survey AI can play prominent role in building the foundation concepts of children. Overall, the gist of the present research study reveals that teacher's reflective perception indicates that artificial intelligence has a great probability of compensating learning difficulties, enhancing creativity and imparting learning to students based on their individual differences.

REFERENCES

Clancey, W. J., Bennett, J. S., & Cohen, P. R. (1979). *Applications-oriented AI research: Education*. Stanford Univ CA Dept of Computer Science.

Copeland, B. (2021, December 14). Artificial Intelligence. Encyclopedia Britannica.https://www.britannica.com/technology/artificial-intelligence

McMurtrie, B. (2018). How Artificial Intelligence Is Changing Teaching. *The Chronicle of Higher Education*.

Roll, I., & Wylie, R. (2016). Evolution and revolution in artificial intelligence in education. *International Journal of Artificial Intelligence in Education*, 26(2), 582-599.

Woolf, B. (1991). *AI in Education*. University of Massachusetts at Amherst, Department of Computer and Information Science.

XuesongZhai, Xiaoyan Chu, Ching Sing Chai, Morris Siu Yung Jong, Andreja Istenic, Michael Spector,Jia-Bao Liu, Jing Yuan, Yan Li. (2021). "A Review of Artificial Intelligence (AI) in Education from 2010 to 2020", Complexity, vol. 2021, Article ID 8812542, 18 pages, 2021. https://doi.org/10.1155/2021/8812542

http://cbseacademic.nic.in/web_material/Curriculum20/AI_Integration_Manual_Introduction.pdf

https://teachablemachine.withgoogle.com/train