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IMPLEMENTING CHATGPT-4 IN EDUCATIONAL TECHNOLOGIES A DETAILED GUIDE TO DEVELOPING LESSON PLANS

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ABSTRACT

The mixed methods study investigated the potential of Chat GPT for lesson planning. Qualitative interviews with 12 teachers explored perceived benefits, challenges, and influencing factors. A questionnaire was completed by 25 teachers then measured agreement with these impacts. Major benefits were time-saving, personalization, and creative content generation. However, information inaccuracies, student overreliance, and content review needs were key challenges. Teacher training, validation, and selective use were critical success factors. Results align with the literature on AI's classroom promise and concerns. While promising for lesson planning, judicious ChatGPT adoption based on technological pedagogical content knowledge appears vital. Further research and teacher support can optimize educational applications.

Keywords: ChatGPT, Education, Artificial intelligence, Lesson plan

INTRODUCTION

Background and Context

Artificial intelligence (AI) is being used more and more in education. According to Tira Nur Fitria, (2021). AI-powered tools are being used for a variety of purposes, including teaching, and learning processes. Innovation and creativity in the learning process are needed to adapt to changes in educational requirements. Artificial intelligence (AI) is being used in education to help with everyday tasks such as teaching and learning. The fast and always changing growth of technology has greatly affected education systems globally, like Feturepedia and ChatGPT Technologies. For example, ChatGPT is an artificial intelligence system that can reply to what users say. This has changed how people communicate with machines and has created new opportunities for teaching and learning (Malik Sallam , M. B. A. B. A.-T., &Nesreen A. Salim. ,2023).

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In November 2022, something unexpected happened in universities. A special computer program called ChatGPT, which can understand and use language, came and changed how teachers taught. It can give summaries, translate, and even make new text. Like many teachers, we are mostly worried about how to create a lesson for students using the tool. It is important to make sure that students do their own work and don't cheat in school. Some universities in the US, like Washington University in St. Louis, Missouri, consider using content generated by ChatGPT as plagiarism. Similarly, some Asian universities, like the University of Hong Kong, have completely prohibited the use of ChatGPT. However, many institutions do not have specific rules or guidelines regarding ChatGPT. The AI tool called ChatGPT surprised everyone with its ability to do very complicated tasks (Baidoo-Anu, D.,& Owusu Ansah, L,2023). Since it became available to the public in November 2022, ChatGPT has gotten a lot of attention and some people in academic circles have had different opinions about it. People think ChatGPT could be helpful in universities, but some people have worries (Malik Sallam , M. B. A. B. A.-T., &Nesreen A. Salim,2023).

‘f’ teachers are not using AI to be creative, they will have problems’’ (Henriksen, 2017; Henriksen Richardson, 2023).

As technology gets better, education changes a lot. Education and technology are connected and have an impact on the populace. Innovative Technology has allowed for amendments in education, and education has also affected the development of technology (Potasheva, Kuzmenko, Plutova, 2019; Mhlanga, 2023). Most teachers and students are using technology to help them learn. Teachers use technology to make learning easier (Mhlanga, 2023). This includes using computer programs, apps, websites, and other devices to make learning better and faster (Radha Firaina & Dwi Sulisworo, 2023).

But, ChatGPT can cause problems for the regular education and research system. People may cheat on online exams using ChatGPT. It can generate text that seems like it was written by a human. This could make it harder for people to think critically. It can also be challenging to evaluate information created by ChatGPT (M. M. R. & Watanobe,2023).

Although ChatGPT can be used in many different areas, it has caused people to start talking again about the good and bad things that can happen with AI technology. The utilize of ChatGPT in instruction has begun discourses nearly how it might influence instruction. People who like ChatGPT think it can help with education by creating personalized and flexible learning experiences (Qadir, 2023). Some scholars are worried about whether ChatGPT is being used in an ethical way (Mhlanga, 2023). Also, how it could possibly harm the way assessments are done (Shannon Tan,2023)., scientific integrity (Cotton, 2023; Shiri, 2023) and students’ higher-order thinking skills (Bunker, 2022). Furthermore, many articles have been written discussing the impact of ChatGPT on education (Asher’ Rospigliosi, 2023). This is a common thing that happens when new technologies are brought into education. It often changes the way things are done and teachers need to adjust to the good and bad things that come with it (Qadir, 2023; Farrokhnia, Banihashem, Noroozi, & Wals, 2023).

Concern in the academic and scientific communities about ChatGPT is valid and growing. Intelligent surveyed college students to determine the prevalence of ChatGPT in homework assignments (Frith, 2023).

According to Deiana, Dettori, Arghittu, Azara, Gabutti, et al. (2023) ChatGPT responses were clear and 85.4% accurate and their correctness, clarity, and exhaustiveness were qualitatively higher in GPT-4.0 responses than in GPT-3.5 responses at 5.6%, 17.9%, and 9.3%, respectively). Using ChatGPT for learning can be a good and useful option, but users should also be careful and choose wisely when using it (Radha Firaina & Dwi Sulisworo, 2023).

This technology provides great chances for students and teachers, like feedback that is tailored to them, easier ways to access information, conversations that are engaging, getting ready for lessons, evaluating progress, and finding new ways to teach difficult ideas (Watanobe, 2023).

This study is valuable because it will help us understand how technology impacts learning and how we can use it to make teaching and learning better. It can also help create new technologies that make learning easier in the future.

According to what was mentioned before, no study has been done on using AI to make a lesson plan. So, this paper aims to answer the research question below. How can AI help teachers make lesson plans? We will study how teachers have used ChatGPT, an AI tool, to see if it has helped them teach, learn, and do research on new technologies in education.

OBJECTIVES OF RESEARCH

Examine the potential of ChatGPT4 for lesson planning

Explore the benefits and challenges of using ChatGPT4 in this context

Identify the factors that influence the effectiveness of ChatGPT4 in lesson planning

Significance of the Study

This research is important because it gives us ideas about how we can use ChatGPT4 to help with planning lessons. The results of this research can assist teachers in deciding whether or not they should use ChatGPT4 in their classrooms.

Scope and Limitations

This study was conducted in a single school district with a small sample of teachers. The findings of this study may not be generalizable to other settings. Additionally, the study only investigated the use of ChatGPT4 for lesson planning. The potential of ChatGPT4 for other educational purposes, such as assessment and personalized learning, was not explored.

CHATGPT

Concept of CHATGPT

OpenAI's ChatGPT has become a popular topic lately, which has sparked excitement for AI among both the tech community and the public. ChatGPT is a much better chatbot compared to older ones that were available to the public before. It can have normal conversations and learn information

quite reliably. Additionally, it can help with creating written materials and computer programs according to human instructions, and can also fix mistakes in text or problems in code (Xue, Yu, & Wang, 2023). ChatGPT is an experimental AI chatbot that can understand how humans talk and write detailed text that seems like it was written by a person. This is the newest version of the GPT family of AI systems that can create text. A chatbot is a kind of computer program that can talk to people like a human does. The ChatGPT Chatbot was made by a company called OpenAI in San Francisco. The Chatbot became available for people to test for free on November 30, 2022. Today, we are going to examine the GPT and try to understand what it signifies (Chinonso, Theresa, Aduke, 2023).

In the simplest terms, ChatGPT refers specifically to Anthropic's conversational AI system. Original ChatGPT (Anthropic) was a publicly launched conversational AI chatbot in 2022. Trained by Anthropic using self-supervised learning on diverse datasets. Intended for general purpose use. Free to access. GPT-3.5 (OpenAI) is an upgraded version of GPT-3 launched later in 2022. Powers OpenAI applications like ChatGPT through its API. More parameters and data than GPT-3. Proprietary model. GPT-4 (OpenAI) is the Latest multi-modal version released in March 2023. Significantly more advanced than GPT-3.5. Incorporated into paid-access ChatGPT Plus service ($20/month) and OpenAI API ($0.03 per prompt). The key differences between the versions are the organization, model architecture, training data/techniques, whether access is free or paid (GPT-4 has a paid tier), and the intended capabilities. On the account of Deiana, Dettori, Arghittu, Azara, Gabutti, et al. (2023) GPT-4.0 responses were more accurate and correct, clear and exhaustiveness than its preceding version by 5.6%, 17.9%, and 9.3% **(Table 1).** The Diary of India depicts ChatGPT as an AI that can have discussions like a human, or at slightest that's what it claims and is accepted to do. ChatGPT is a really smart Chatbot that uses a fancy technology called GPT, created by OpenAI. This tool can handle many kinds of requests that involve text. It can handle simple questions and answers, as well as more complex tasks (Zhang, Weng, Lund, 2022; Mali, Deshmukh, 2023). OpenAI's ChatGPT is a large language program created to have conversations with people. ChatGPT is a huge tool that learns from a lot of information (Azaria, Azaria, 2022). For occasion, in case you would like help with composing a message to a co-worker, ChatGPT can effortlessly make a thoughtful and well-written letter. Moreover, on the off chance that you have got a co-worker who isn't being profitable but you do not know what to say, ChatGPT can help you. ChatGPT is a powerful tool that can write in-depth papers about topics like artificial intelligence's benefits. It has a lot of information and works quickly to get tasks done. This is a special feature of ChatGPT that is useful for people who do academic research.

Table 1. Comprehensiveness of ChatGPT.

Item	Mean score		Percentage		△ (%)
	GPT-3.5	GPT-4.0	GPT-3.5	GPT-4.0	
Correctness	3.27	3.45	81.8	86.4	5.6
Clarity	3.05	3.59	76.1	89.8	17.9
Exhaustiveness	3.41	3.73	85.2	93.2	9.3

Correctness: plausibility, coherence, scientific veracity, and evidence, Clarity: ease of understanding.

Appropriateness of vocabulary, conciseness, and logical order, Exhaustiveness: degree of completeness.

Evolution of AI in Education

The use of AI in education has a long history. On the account of Roll & Wylie (2016) Artificial intelligence in Education (AIED) can be traced back to the early 1980s, when the first intelligent tutoring systems (ITS) were created. Personalized instruction based on each student's needs and learning inclinations is what these systems are intended to offer. After that, AIED research developed significantly in terms of theoretical contributions, technological advancements, and effects on education **(Figure 1).**

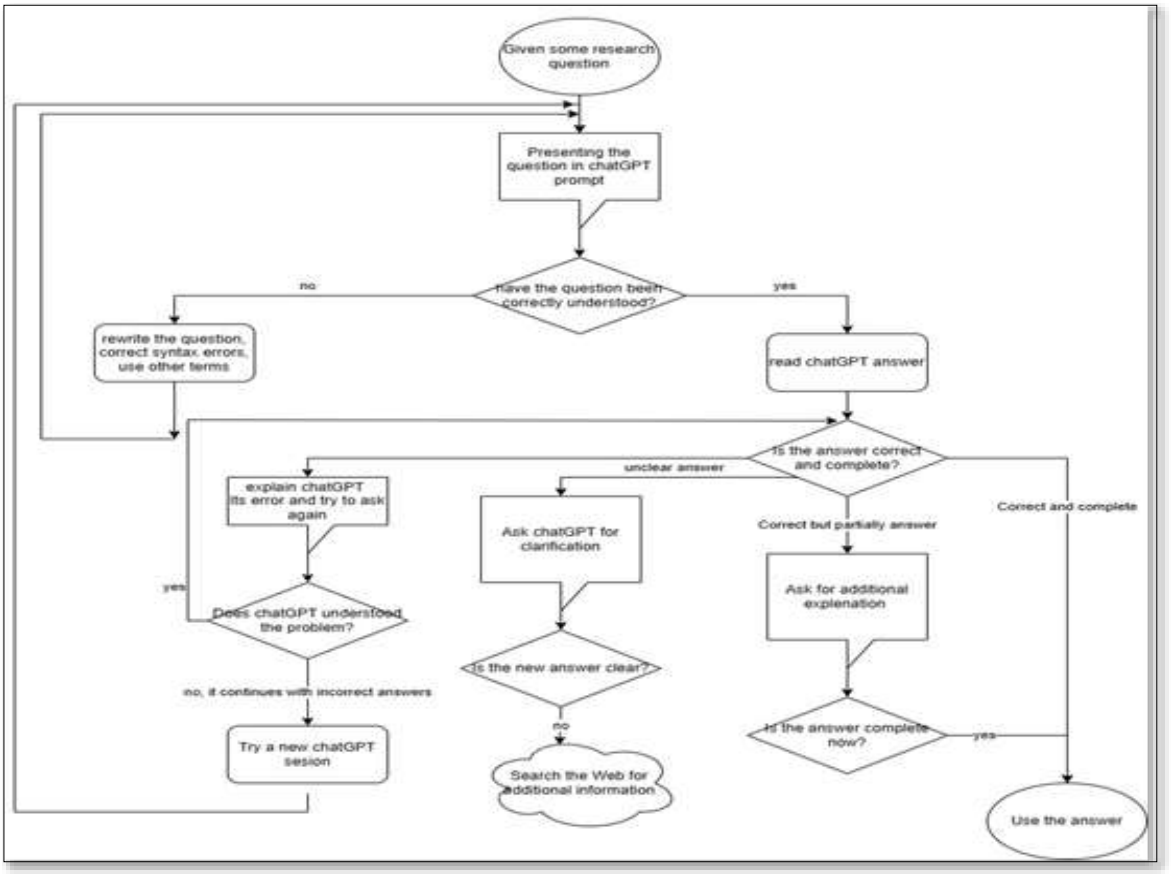

Figure 1. ChatGPT Dialog Flow Chart.

With the launch of the Journal of AIED in 1994, researchers now have a place to publish their work and disseminate their findings to a larger audience. The journal's 20th anniversary was celebrated in 2004 and its 30th anniversary was celebrated in 2014.

To understand the focuses and common situations that are involved in the field of AIED, Roll & Wylie, (2016) study shows that AIED has undergone significant developments and offers opportunities for new interaction styles. The way we educate is changing. Instead of just focusing on what students learn, we are now also paying attention to how they learn. This means that we are now teaching them important skills like being able to manage themselves, work well with others, and stay motivated. Early AI-powered tools were used for simple tasks, such as grading papers and generating test questions (Hinduja, Afrin, Mistry, & Krishna, 2022). opined that in recent years, the capabilities of AI have advanced significantly and this

has led to the development of more sophisticated AI-powered tools that can be used for a variety of educational purposes.

In the 2000s, AI began being incorporated into popular education technologies and platforms. For example, learning management systems leveraged AI to track student progress and performance. Massive open online courses also utilized AI for grading and student feedback functions. More recently, AI-powered virtual tutors, personalized learning apps, and intelligent agents have gained prominence in education A (Sateesh Neha, Bhanusri, Khaja Mohiddin Pasha, Sameer, Gopala krishna,2023). AI, such as ChatGPT, would not replace educationists but not only serve as a tool but also create more jobs in education. According to Sateesh Neha, Bhanusri, Khaja Mohiddin Pasha, Sameer, Gopala Krishna, (2023) the number of job openings for knowledge and analytics skills could rise by 364,000 to 2,720,000 in 2020 based on a recent report from IBM. Also, according to Ioannidis, Kepner, Bowne, & Bryant, (2023). A new study by Microsoft and McKinsey involved more than 2,000 students and 2,000 teachers from Canada, Singapore, the UK, and America. They found that artificial intelligence (AI) is already helping teachers and schools find interesting ways to see how well students are doing and create personalized lessons quickly. According to Roll,& Wylie, (2016) AI in education has transitioned from a focus on content delivery to emphasizing learning processes, metacognition, collaboration, and motivation. Grounded in cognitive science and psychology, today's educational AI uses technology to understand and process human language, learn from data, and make connections using complex algorithms analytics to create dynamic, student-centered learning experiences. Chatbots like ChatGPT represent the latest evolution in conversational AI aiming to simulate human tutoring interactions.

The capabilities of AI tools have grown exponentially, leading to increased adoption in teaching and learning. However, effective integration remains a challenge requiring careful alignment with pedagogical goals and curriculum outcomes (Hinduja, Afrin, Mistry, & Krishna, 2022). Implementation is also influenced by ethical, legal, and privacy considerations. Nevertheless, AI holds immense promise to transform learning if harnessed thoughtfully.

The use of AI-language models in education technologies

One of the most hopeful aspects of AI in education is the utilization of AI-language models. AI-language models learn by studying huge collections of written material and computer instructions. This helps them create sentences, change languages, write different types of creative pieces, and respond to your questions with helpful information. According to Harry, the math performance of students can be increased by up to 30% using Carnegie Learning's AI-powered software. According to Sateesh Neha, Bhanusri, Khaja Mohiddin Pasha S,K, Sameer, S.K., Gopala Krishna, (2023) some specific examples of AI being used in education include intelligent tutoring systems, which provide personalized feedback and guidance to students; language processing programs, which can assist students in getting better at writing and communicating and autonomous agents, which can simulate real-world scenarios and provide interactive learning experiences. According to Gric-coast, Lyon, Cedex, (2000) the PUMP Algebra Tutor, also known as the

Practical Algebra Tutor, is a computer program that helps students learn algebra. In a study, students who used this program in their classes did better on tests compared to students who did not use it. The students using the program scored 15% higher on standard tests and 100% higher on tests specifically designed to measure their progress with the PUMP program. These AI programs have made learning better by giving students personalized help, getting them involved in fun activities, and teaching them how to think through problems.

Overview of ChatGPT4 plus its Unique Features

Koraishi, (2023) ChatGPT4 is a large language model chatbot developed by OpenAI. It is among the best advanced AI-language models available.

Azaria, Azoulay, Reches, (2023) opined viewed ChatGPT is an advanced chatbot constructed on the foundations of large language models (LLMs) and significantly fortified by voluminous training data.

According to Azaria, Azoulay, Reches, (2023) ChatGPT possesses a tremendous potential that is progressively being recognized, explored, and exploited across an array of sectors in our economy. Its proficiency in understanding and generating natural language has seen it evolve into a highly versatile tool, with a broad spectrum of applications spanning numerous industries **(Figures 2 & 3).**

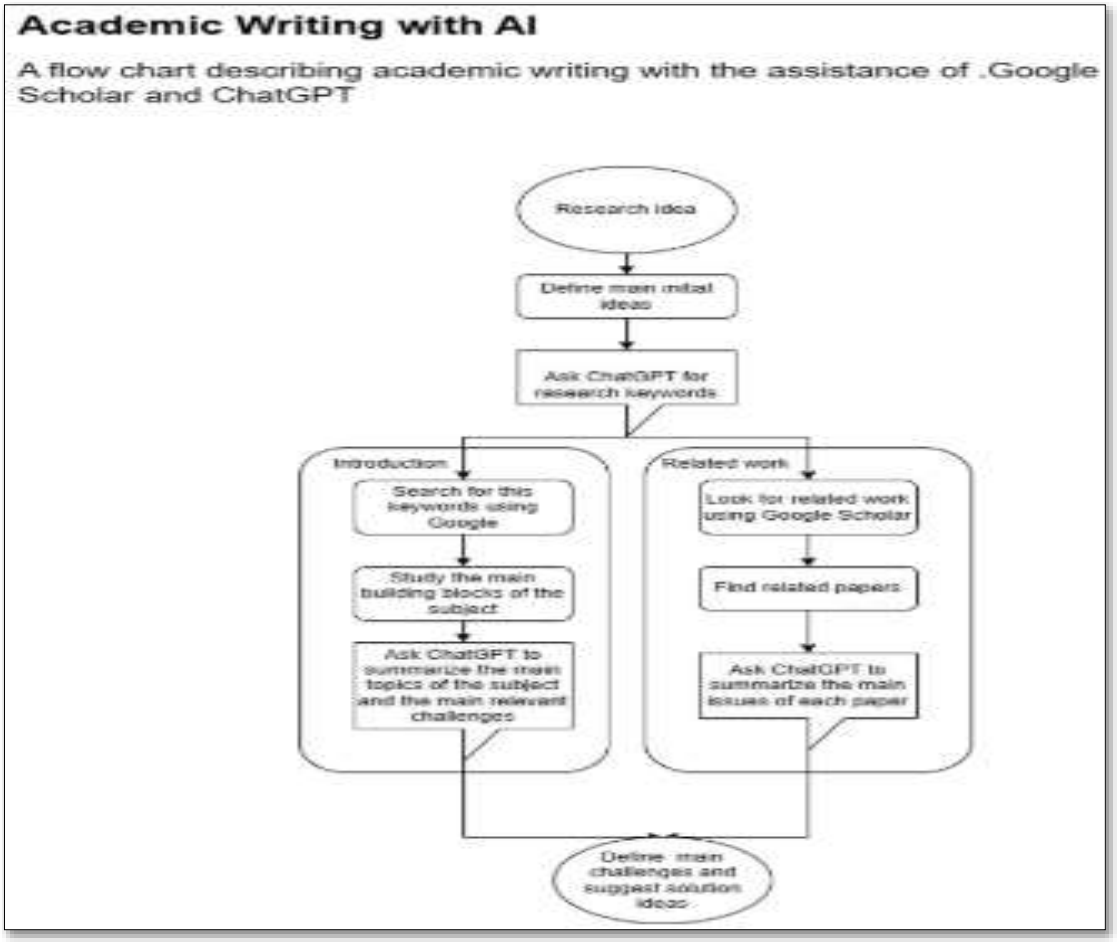

Figure 2. Study with ChatGPT.

Figure 3. Study with ChatGPT.

ChatGPT4 has several unique features that make it well-suited for lesson planning. These features include: the ability to generate personalized lesson plans, the ability to provide feedback on student work, and the ability to generate creative content.

EMPIRICAL REVIEW

Many studies have looked at how AI can be used in education. These studies have shown that AI, particularly ChatGPT, can be a valuable tool for education. However, the studies have also found that there are some challenges associated with using AI, such as the need for teacher training and the potential for bias in the generated content.

Kusunose, Kashima, Sata, (2023) used Shannon Entropy ChatGPT on the same questions and found that 7 out of the 12 repented questions results show an entropy of p-value > 0.05. Kusunose, Kashima, Sata, (2023) concluded that the overall 64.5 % accuracy found in the ChatGPT is not sufficient to establish significant accuracy of the ChatGPT.

In another similar study, Deiana, Dettori, Arghittu, Azara, Gabutti, (2023) found ChatGPT-4 to be correct, clear, and exhaustive at a significant rate of 85.4%.

Azaria, Azoulay, Reches, (2023) examine how well ChatGPT helps with making software processes better, learning, and doing research. The results show that ChatGPT does a good job with tasks that have clear rules, like changing code to a different language and explaining common ideas. However, it has trouble with tasks that require explaining words that are not well-known and creating new code without any examples. The researchers suggest that we should confirm and enhance the use of ChatGPT in improving software processes by adding other methods to make sure it is correct. The research also talks about how ChatGPT can make people work better and bring benefits to industries like banking, hospitality, and information technology. However, it also mentions problems like privacy worries, unfairness, misuse, and spreading false information that can come with using this technology.

Azaria, Azaria, (2022) conducted a study research which shows that ChatGPT seems to prefer using numbers instead of writing them out in words. The analyst discovered a strong connection between the recurring numbers produced by ChatGPT and people's favorite numbers. The most common number generated by ChatGPT matches with the number that humans like the most. He also discusses some advantages and disadvantages of ChatGPT as a conversational tool.

According to Kengam, (2020) this text explains how Artificial Intelligence can be used in education. AIED is a discipline in educational technology that is growing rapidly, as reported at the 21st Global Conference on Artificial Intelligence in Education held in 2020. Teachers are still unsure about how to use artificial intelligence (AI) for academic purposes in a larger way. They are also uncertain about how AI might affect teaching and learning in higher education. The expert discussed how AI affects teaching and its advantages and disadvantages. This text describes a way to create a special system for teaching using artificial intelligence (AI), and it also explains the impact of AI in education.

Gocen, Aydemir, looked at what could happen with the use of AI in education and what it could mean for schools in the future. The study was conducted using phenomenology, which is a subjective research method that looked at the perspectives of participants from different groups. When AI is introduced in education, schools and teachers will have advantages, disadvantages, and things that are not being used, based on the research. The comes about give a few proposals for the utilization of AI and the moderation of conceivable challenges. Whereas most participants appear to have ideal states of mind approximately AI, there are a few concerns approximately long run of instruction, especially among instructors and scholastics. Lawyers and experts in the law are more focused on the proper ways to use AI in education and the potential problems it may cause. On the other hand, engineers view AI as a tool to improve the quality of education and benefit everyone in the education industry.

Verma, (2018) presents a diagram of this innovation and the degree of counterfeit insights in numerous spaces, with a center on its utilization in

instruction, as well as its meaning, looking techniques, advancements, and future.

Cope, Kalantzis, Searsmith, (2021) provide some preliminary responses, initially as a hypothetical scenario, and then in essence, in an examination of the outcomes from various research implementations that have been documented in greater detail elsewhere. Our main finding is that artificial intelligence will never replace human instructors in electronic computing systems. This is because the way it operates and what it accomplishes are fundamentally different from human intelligence. Even though this work has some limitations, it has the potential to improve education in ways that may seem surprising - by making it more human instead of less.

van der Vorst, & Jelicic, (2019) examined the part of instructive AI applications in custom-made learning. According to Bloom, (1984) students who receive individual coaching perform much better than those who learn through regular educational methods, by a large difference. Individualized learning with a teacher for each student is often not possible in society because there are not enough teachers and it can be very expensive. New discoveries in machine learning provide great opportunities for assisting personalized learning. Artificial intelligence (AI) can help provide personalized instruction to each student, allowing for one-on-one learning experiences. We are looking at how AI might affect personalized learning. Therefore, we are studying how innovation can be improved and how certain factors, like laws, society, and ethics, will affect its use. Finally, we suggest plans for making it possible to use personalized learning apps powered by AI.

Giri, Jain, Zeng, Bruniaux, (2019), we looked at how fake information can be used in teaching and learning in college, and what happens when AI is used in college. This text discusses how rapidly changing technology affects the way we learn and teach. Artificial intelligence (AI) helps educational institutions make their resources easily accessible and at a very fast pace. This includes not only in the classroom but also outside of it. This paper tries to understand how AI has become an important part of universities and the immediate and long-term effects on certain aspects of higher education. The difficulties in accepting AI in these schools were also examined. This survey will provide valuable information to teachers and help them understand how to improve education. This will create opportunities for future growth. The colleges in Udaipur, Rajasthan, will be used for studying. We conducted surveys and collected information from teachers about their thoughts and opinions. We used recurrence tables and graphs, as well as one-way ANOVA, to analyze the information we collected for our study. This helped us achieve our study's goals. The study found that using AI in higher education greatly helps students learn better. It also shows that AI has a lot of potential for the future in higher education **(Figure 4).**

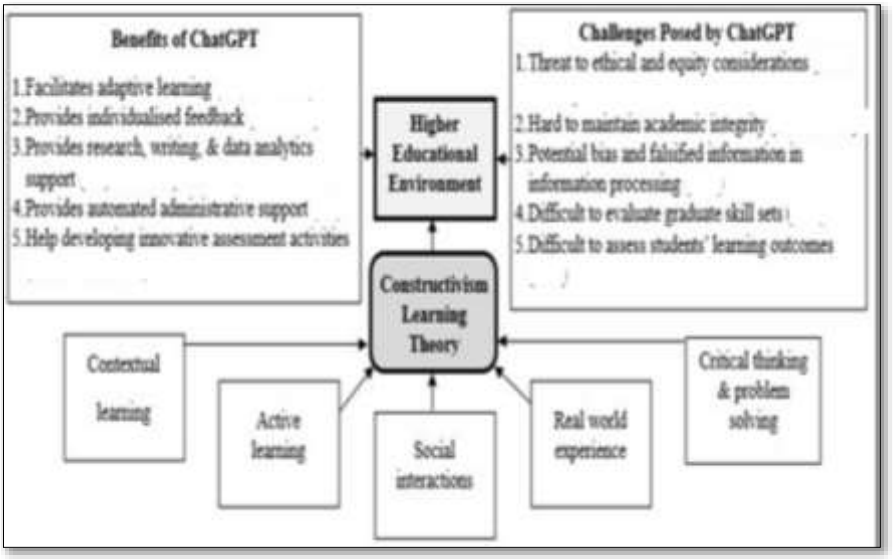

Figure 4. Benefits and Challenges of ChatGPT.

THEORETICAL FRAMEWORK

Constructivism and Cognitive Learning Theories

Constructivism posits that learners construct knowledge through experience, reflection, and social interaction (Yilmaz, 2011). Cognitive learning hypotheses center on how data is gotten, organized, put away, and recovered by the intellect (Çeliköz, Erişen, Şahin, 2016). These theories suggest that students learn best when they are actively engaged in creating knowledge rather than passively receiving it (Koehler, Mishra, 2005). AI tools like ChatGPT can facilitate constructivist, student-centered learning by providing personalized scaffolding, feedback, and practice opportunities. The interactive nature of ChatGPT also aligns with cognitive learning principles **(Figure 5).**

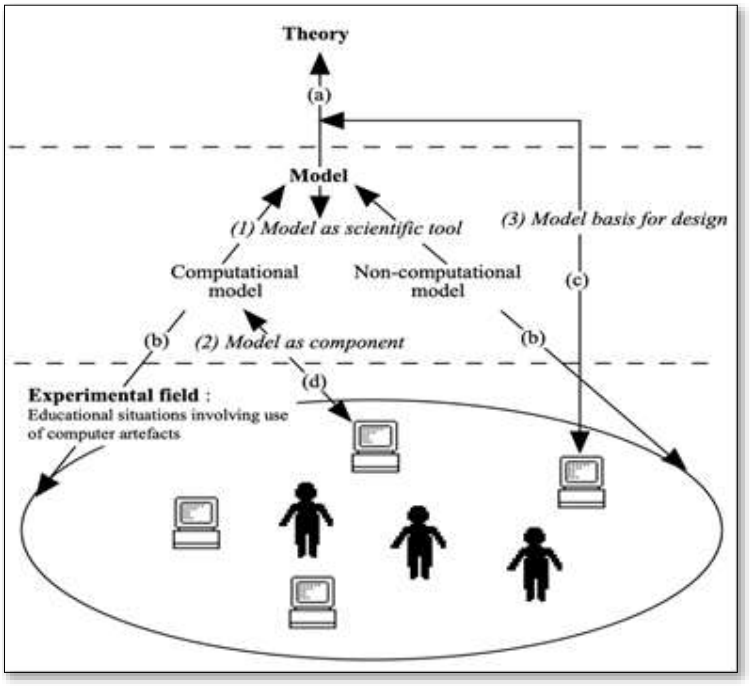

Figure 5. Role of Model in AI Educational Research.

Technological Pedagogical Content Knowledge (TPACK) Model

The TPACK system highlights the interaction between innovation, instructional method, and substance information required for viable innovation integration (Rosenberg, Koehler,2015). Teachers need appropriate TPACK to utilize ChatGPT for lesson planning. Technological knowledge of ChatGPT's capabilities is essential. Pedagogical knowledge should inform how ChatGPT is incorporated into instructional strategies. Content knowledge remains vital for evaluating ChatGPT's subject relevance. Applying TPACK can optimize ChatGPT's use for lesson planning.

MATERIALS AND METHODS

Research Design

An exploratory successive blended strategies plan was utilized with a starting subjective stage taken after by a quantitative stage to generalize discoveries.

Phase 1 - Qualitative

Virtual semi-structured interviews were conducted with 12 teachers who had used ChatGPT for lesson planning. Purposive sampling targeted educators across subject's/grade levels with ChatGPT experience. Interviews examined ChatGPT's perceived benefits, challenges, and influencing factors. Data was analyzed using thematic analysis.

Phase 2 - Quantitative

A survey questionnaire was developed based on Phase 1 findings and administered to 25 teachers who use ChatGPT for lesson planning. Convenience sampling was used. The questionnaire measured perceptions of ChatGPT's impact on lesson planning using Likert-scale ratings. Descriptive statistics were calculated.

INTEGRATION

Results from the qualitative and quantitative strands were integrated during interpretation to provide comprehensive insights.

RESULTS AND DISCUSSION

Perceived Benefits of ChatGPT for Lesson Planning

Interview participants highlighted saved time, personalized learning, and creative content generation as major benefits. The questionnaire results indicated high levels of agreement with these benefits (mean ratings of 4.1-4.5 on a 5-point Likert scale at p-value < 0.05).

Perceived Challenges of ChatGPT for Lesson Planning

Key challenges from interviews included information inaccuracies, potential student overreliance, and the need for post-generation review. Moderate questionnaire agreement emerged for information accuracy concerns (mean = 3.1). However, student overreliance and content review need to be rated higher (means of 3.8 and 4.2 respectively).

Influencing Factors

Interviewees emphasized teacher training, validation of generated content, and selective/strategic ChatGPT use as critical success factors. Questionnaire results showed strong agreement for these influencing factors (means of 4.3-4.5).

DISCUSSION OF RESULT

The perceived benefits align with the literature on AI's classroom potential (Neha, 2020). However, information inaccuracies echo reliability concerns found in previous studies (Azaria, 2023). The need for judicious, TPACK-guided adoption mirrors recommendations for balanced AI integration (Koehler, Mishra, 2005; Kengam,2020).

CONCLUSION

At his study gives experiences into the potential of ChatGPT for personalized, feedback-oriented, time-saving lesson planning. Key benefits, challenges, and influencing factors were identified. While promising, judicious and strategic adoption based on a strong TPACK foundation appears vital for ChatGPT's effective use in lesson planning. Further research, teacher training, and collaborative technology evaluation can optimize educational applications.

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