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Impact of Artificial Intelligence Enabled Technological Pedagogical Implications in Higher Education

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Abstract

The current study examines how the integration of Artificial Intelligence (AI) into education system is continuously transforming teaching and learning with innovations like personalized learning systems, chatbots and learning analytics. Nowadays, teachers are required to gather the related knowledge and skills to effectively leverage these technologies for designing AI enhanced lesson plans, enhancing student learning and automating administrative tasks. This research study investigates the influence of AI awareness on pre-service teacher's perceptions of Artificial Intelligence-enabled Technological Pedagogical Content Knowledge (AI-TPACK). The integration of ICT tools offers numerous benefits to both educators and students. These tools boost student participation and motivation by offering interactive and multimedia-enriched learning encounters. They also facilitate personalized learning through adaptive systems and customized learning pathways, catering to individual student needs and preferences.

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Collaboration and communication tools foster active learning and encourage meaningful interactions among students and between students and instructors, transcending geographical barriers. ICT tools expand access to a vast range of digital resources, empowering students to explore diverse learning materials and develop critical thinking skills

Keywords: artificial intelligence, learning, perception, pedagogical implications.

Introduction

In ancient India, the teaching-learning process took place with the disciples raising the questions and the gurus answering them. This Guru-Shishya Parampara continued for centuries. But it was replaced by 'Chalk and Talk Method' as a result of introduction of Lord Macaulay's Minute in 1835.Next, when the Radio was invented a century ago, some innovative teacher was quick enough to use it as a teaching aid. Further, as a result of innovation whenever a scientific gadget like tape recorder, Television and computer reached the schools and colleges, the language teachers started using them as learning gadgets. Later on, Information Communication Technology paved the way for android smart phones with several apps and tools revolutionizing the spread of information. The transformation in teaching methodology is ever evolving from one method to another and new teaching aids are being used to pass on information to larger number of students with less strain during the last 200 years. When we observe the evolution of different methods and teaching aids, we understand that after the introduction of blue print of Indian Education system by Lord Macaulay in 1835, the 'Chalk and Talk Method' of teaching attained prominence over the age-old method of oral tradition of passing on information by word of mouth and also the black-board too became an indispensable and popular teaching aid.

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Further, the teaching aids include the charts, pictures, flash cards etc., but whenever new media is invented in the field of science and technology, it was adapted as a supplementary teaching aid. For instance, when Radio was started in 1930, it was the new media and to broadcast pitman's shorthand lessons, it was used by some innovative English teacher. Further, as a result of innovation whenever a scientific gadget like tape recorder, Television and computer reached the schools and colleges, the language teachers started using them as learning gadgets. Later on, Information Communication Technology (ICT) paved the way for android smart phones with several apps and tools revolutionizing the spread of information and the same are being exploited by the teacher and the taught. In fact, the definition of new media changes as and when new innovations were made which include the radio of 1930s and the ChatGPT of the present day. We all know that the advent of computers in second half of 20th century made the English teachers to adopt computers as teaching aids and we have Computer Assisted Language Learning (CALL), internet made English teachers to opt for Web Assisted Language Learning (WALL), Android smart phones gave rise to Mobile Assisted Language Learning (MALL) and now the invention of chatbot ChatGPT is making people to exploit Artificial Intelligence Assisted Language Learning (AIALL).

Globally, people are being controlled by AI and AI tools and Apps. It has become a buzz word in the field of education and healthcare. In fact, it is shaping the modern life. On November 30, 2022, a very powerful AI (Artificial Intelligence) controlled chatbot ChatGPT developed and run by a company called Open AI made open to all to interact. In fact, it is not altogether a new one but the earlier versions have been developed. It is a large language model (LLM) trained by Open AI, an artificial Intelligence research and deployment company which was released in a

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free research preview on November 30, , 2022 and learns about its strengths and weaknesses to get user's feedback. In ChatGPT, GPT stands for Generative Pre-trained Transformer, a complex neural network based on the revolutionary Attention concept. ChatGPT is a form of generative- a tool that lets users to enter prompts to receive humanlike images, text and or videos that are created by AI. As stated earlier, just as with other digital advances, it inspires language teachers, researchers to apply it for simplifying and enhancing the learning of a second or foreign language.

ICT tools are integral to Education 4.0 as they enable digital transformation, personalized learning, blended learning models, the cultivation of digital literacy and skills relevant to the 21st century, lifelong learning, global collaboration, data-driven decision making, and fostering entrepreneurship and innovation. These tools empower learners and educators to thrive in the digital era and harness the benefits of the Fourth Industrial Revolution in education.

ICT Tools and Teaching Pedagogy

ICT (Information and Communication Technology) tools refer to a wide range of digital technologies, software applications, and devices that facilitate the creation, storage, management, and communication of information. These tools are designed to enhance the teaching and learning process by providing educators and students with innovative ways to access, interact with, and share educational content. Here are some examples of ICT tools commonly used in higher education:

1. Learning Management Systems (LMS): Learning Management Systems (LMS) such as Blackboard, Canvas and Moodle offer a consolidated digital space in which educators can

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generate, distribute, and oversee online courses. LMS tools typically include features such as content management, discussion forums, assignment submission, grading, and communication tools.

2. Multimedia Presentation Tools: Tools like Microsoft PowerPoint, Prezi, or Google Slides empower educators to craft visually captivating and interactive presentations. These tools allow the incorporation of multimedia components such as animations, video and audio and images to enhance the delivery of educational content.

3. Collaboration and Communication Tools: ICT tools like email, instant messaging platforms, for example, Microsoft Teams and Slack, alongside video conferencing software such as Google Meet and Zoom, facilitate communication and foster collaboration among students and instructors. These tools enable real-time interactions, group discussions, virtual meetings, and project collaborations regardless of physical location.

4. Online Assessment and Feedback Tools: Online assessment tools like Quizlet, Kahoot, or Google Forms allow educators to create and administer quizzes, tests, and surveys electronically. These tools often provide instant feedback to students and help instructors track student progress and identify areas for improvement.

5. Virtual Reality (VR) and Augmented Reality (AR): The adoption of VR and AR technologies is on the rise in higher education to design immersive and collaborative learning encounters. These tools empower students to delve into virtual settings and engage in simulations, and conduct hands-on learning activities in a safe and controlled manner.

6. Online Research and Reference Tools: Online databases, digital libraries, and academic search engines like Google Scholar, JSTOR, or ProQuest provide students and

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educators with ingress to an extensive array of academic resources and research articles.

7. Content Creation and Publishing Tools: ICT tools such as blogs, wikis, podcasting software, and video editing tools empower students to create and publish their own digital content. These tools encourage creativity, critical thinking, and the development of digital literacy skills.

8. Mobile Applications: Mobile apps designed for education, such as language learning apps, educational games, and interactive study tools, provide students with flexible and on-the-go access to educational content.

These are some ICT tools available for enhancing teaching pedagogy in higher education. The integration of these tools enables educators to create dynamic, interactive, and personalized learning experiences while promoting collaboration, engagement, and knowledge acquisition among students.

ICT Tools in Education 4.0

ICT tools are integral to Education 4.0 as they enable digital transformation, personalized learning, blended learning models, the cultivation of digital literacy and skills relevant to the 21st century, lifelong learning, global collaboration, data-driven decision making, and fostering entrepreneurship and innovation. These tools empower learners and educators to thrive in the digital era and harness the benefits of the Fourth Industrial Revolution in education.

Prospects and Pedagogical Extensions

ChatGPT encourages language acquisition by imitating real-world encounters. It has the

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ability to determine a word's meaning in relation to its context, explain grammatical errors, construct writings of different genres (such as emails, stories, and recipes), create quizzes, analyze texts, and provide definitions from dictionaries, example clauses, and translations. When a teacher offers students a text, they might not comprehend the context-specific meaning of some terms. Figure 1 demonstrates how ChatGPT can define these concepts and carry on the conversation by responding to further queries. Learners can also request a response in their native tongue (for instance, Hindi) if they like.

AI-enabled Technological Pedagogical Content Knowledge (AI-TPACK) scores revealed an overall positive perception among pre-service teachers (Celik, I. 2023). This indicates that pre-service teachers perceived themselves as having the required knowledge and skills to effectively utilize AI-enabled resources in an AI-enabled classroom. Additionally, the study discovered that there is a significant association between the awareness of AI-related educational software and the mean perception of AI-TPACK among pre-service teachers. The significant relationship between knowledge level of AI; engagement with AI, and perception of AI-TPACK revealed that a higher level of knowledge and frequent interaction with AI among pre-service teachers can increase their accessibility of AI tools in the classroom. However, only 11.50% of the participants said that they had received formal training in AI. It reveals the possibility of a self-learning attitude among pre-service teachers and their interaction with AI in daily life via social media applications.

In conclusion, we would like to draw the attention of stakeholders, education policymakers, and teacher training institutes to revamp their teacher training course curricula while considering technological advancements at regular intervals. Early adaptation to

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technological advancements can lead towards developing more tech- friendly teachers. Further research can focus on utilizing the required tools and techniques on pre –service teachers and can study its impact on their awareness level and their AI related competence.

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