

AI APPLICATIONS FOR PROGRESSIVE TEACHERS

Abstract

Progressive-Teachers are the pre-service trainee-teachers in the training institutions wherein they would accumulate the knowledge, and develop the skills and strategies to teach the school children in their career. Currently, the trainee-teachers are following the ICT curriculum without any underpinning the applications of Artificial Intelligence (AI). Alan Turing's statement about AI, "Artificial Intelligence is a field, which combines robust datasets, to enable problem-solving. It encompasses sub-fields of machine learning and deep learning, which are frequently mentioned in conjunction with AI." In the aftermath of covid-19 situation, the teacher role enhanced through the applications of online teaching integrated with technological gadgets of cutting-edge technology. Every progressive teacher must imbibe the vibrant ICT accessed tools irrespective of their pedagogy of teaching to become a hybrid teacher to incorporate the ICT instructional competency as affirmed by UNESCO. AI is one such tool, which is bringing forth revolutionary changes by exploring the data available on the internet storage. The implications of AIEd (Artificial Intelligence in Education) are personalized learning, voice assistance, the creation of smart content, gamification, tutoring, virtual learning, etc. The AI-driven applications in education are Chat GPT, Google Cloud Speech-to-text, Open CV, Knewton, Kahoot, photomath, Open, Image Creator, etc. Now it is high time to roll out these AIEd capabilities in the teaching-learning process of progressive teachers to become 21st-century smart teachers.

Keywords: Progressive-Teachers, ICT, and AIEd.

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I. INTRODUCTION

Pre-service teacher training courses like B.Ed, D.Ed., and others are the conditioning platforms for trainee-teachers to imbibe the knowledge, attitudes, values, strategies, and skills during their course practice. These are also the virtues of AI to be transformed into multiple disciplines at all levels of NEP 2020, from early childhood to higher education. The dynamic rollout and dramatic shift in the vibrant Artificial Intelligence (AI) powered software applications embedded in internet-accessed devices and gadgets are being opened up unimagined internet highways. In the fast, ever-changing scenarios in our day-to-day life activities, the visible and invisible applications of AI impelled us to follow them knowingly and unknowingly. The scope of AI-driven apps is established right from browsers (Google Chrome and MS Edge) to social sites (Facebook, Instagram, Twitter, etc.) to Commercial sites (Amazon, Flipkart, eBay, etc.) to AI-driven vehicles. The education sector is not alien; it is influenced by AI applications as well. As the needs and wants of society and learners change, the dynamics in education also proportionately need to change. This further results in the adaptation of AI-generated innovations in the development of physical infrastructure, curriculum, planning, and organization of resources, teaching-learning processes, and evaluation. In the current scenario of Karnatak University's, two years (Dharwad, Karnataka, India) B.Ed. course curriculum, ICT basics, and ICT practical/lab-mediated activities mainly leverage the internet-accessed computer, camera, video camera, tab, etc. as hardware materials.

Many software applications installed in the devices are being facilitated in the teaching-learning processes, precisely compiled to create various programs like slides, Slideshare, teacher tube/youtube, digital presentations, audio-video recording, and editing, adding over voice to video and adding background music, research data analysis, publications, activities of graphic software and animations, picture, files, concept map tools, E-book tool, web-related activities, creating and editing wikis, bloggers, use of educational and social media, online and offline software, and Computer Assisted Instruction (CAI), Open Educational Resources (OER), e-resources and reporting, etc. But the curriculum of two years in Karnataka University's B.Ed. the course ignorant about developing the efficacy of utilization of cell phones, tablets, and iPads, as also the innovations of twenty-first-century learners' applications, video conferencing, and virtual classrooms. The paramount importance of Artificial Intelligence (AI) applications is the need of the hour of digital-savvy generation. It is high time to integrate these mentioned applications in the syllabus of two years B.Ed. course.

II. MEANING OF ARTIFICIAL INTELLIGENCE (AI)

Whenever a human encounters a problematic situation in his life situation, he uses his intelligence power. It is a mental gymnasium where an individual uses his mental capabilities to grasp, organize, analyze, summarise, and arrive at conclusions. Later on, he will execute the tasks based on the results of human intelligence exercises. Similarly, Artificial Intelligence is established in compliance with how a machine applies its intelligence to behave like a human being using its intelligence. It means that a machine mimic, how our five organs sensitize the information, and the brain compiles the thinking process and directs our body to perform the assigned tasks using an artificial nerve system. This involves covert as well as overt behaviors of humans. According to the definition of Microsoft, "Artificial

Intelligence, or AI, is the capability of a computer system to mimic human-like cognitive functions such as learning and problem-solving.” Therefore, AI uses its neural network to imitate the human brain by using a massive database on internet-accessed storage. Thus, as published in Skylum, “Artificial Intelligence is understood as a non-biological system capable of perceiving and processing information, drawing conclusions and acting on them.” The AI-accessed gadgets follow analytics and algorithms processes in real time whenever they face the learning experiences, thereafter modifying their overt responses based on the inputs received similar to human behaviour. Therefore, the own decision of AI is based on the analytical process and solution.

There is an explosion of Artificial Intelligence in every field - business, economy, health, sports, retail, daily life, transport, communication, and education as well. It collects mammoth homogeneous data available on the internet network accessed devices belonging to the aforesaid various fields. The AI exhibits several simple to difficult tasks which are mentioned here. Speech recognition (Siri, Alexa, Bixby, Chatbots, ATMs, Call centers, etc.), Facial Recognition, Computer vision (self-driving cars/vehicles-Waymo), Translation between languages (Google Translate, DeepL Translator and Microsoft Translator), Advanced search engines (Google, Opera, Neeva AI, Bing AI, MS Edge, Yousat, Bing, Waldo, Bard, and Andi), Recommendation systems (YouTube, Amazon, Facebook, Twitter, Netflix, Amazon Prime, Spotify, Disney, Tidal and Apple), Generative tools (Chat GPT and AI art), Games (Chess and Go), Physical conditions, and Automated decision making. Hence AI knowingly or unknowingly became part and parcel of innovative technology in our day-to-day life activities in a rapid way.

III. ARTIFICIAL INTELLIGENCE IN EDUCATION (AIEd)

AIEd is an emerging interdisciplinary field that applies AI technologies in education to transform and promote instructional and learning design, tutoring, process, assessment, data mining, and analytics. Besides this, it integrates Automatic Facial Recognition System (AFRS) and physical classroom infrastructures amenities to create a conducive learning platform. The other applications are speech recognition, translation between languages, computer vision, advanced search engines, etc.

IV. ADVANTAGES OF AI TOOLS

The stakeholders in the field of education would derive the optimum results in the planning, execution, assessment, and analysis by exploring the ever-trending possibilities of AI applications. They are mentioned as under.

- 1. Personalised Learning:** The AI provides individual feedback to every pupil based on their strengths and weaknesses. It promotes the motivation and engagement of students and also recommends tailored lessons to each one to draw out his or her optimum academic capabilities.
- 2. Tutoring system:** While passing through the AI tutoring system, each student realizes his progress in real-time, followed by feedback and recommendations.

3. **Organised Information:** The frequent use of AI tools gaining momentum in the classroom by instructors, researchers, and educators across the planet. The outstanding skills of AI devices, provide the relentless knowledge to maximize pupils' performance effectively from a variety of resources employed by teachers. For example, Google Scholar and educational videos help students to decrease the use of conventional books, dictionaries, and lectures.
4. **Supports Special Students:** Students with learning disabilities need a unique way of personalized instruction. Their pace of learning is slower in large group instruction. AI tools facilitate this one-on-one learning.
5. **Automated Grading and Assessment:** AI assists to grade students essays and quizzes and provides feedback quickly, thus reducing the teacher's workload as well. This saves teachers efforts and time and permits instructors to do other academic activities
6. **Adaptive Testing:** AI helps to overcome learning difficulties in real-time by adjusting based on personalized assessment.
7. **Chatbots:** The 24/7 chatbots provide answers and remedies to pupils' queries.
8. **Virtual Reality Learning:** Pupils can get admission to premier institutions without leaving their geographical location to study virtual reality courses.
9. **Learning Management System:** LMS is used to analyze every student's performance data, then gives insights and recommendations to educators.
10. **Integrated Learning:** Ergo, AI creates real-world experiences in immersive learning. It provides numerous possibilities to assimilate the information at a significant rate.
11. **Lower Human Error:** The earlier academic tasks completed by the teachers have been auto-corrected by the AI tools, thus minimizing the errors.
12. **Academic Standards:** The AI cutting-edge approach elevates educational courses to the

next level of the education system. This involves the formulation of course content, materials, immediate feedback, motivation, and engagement of the students.

V. DISADVANTAGES OF AI TOOLS

- AI tools make pupils heavily dependent, so this limits critical thinking and creativity.
- These are less accurate than teacher graders and lack fair assessment and grading.
- As students overly rely on the feedback of AI, which minimizes the efforts and improvement in
- writing skills.
- Since pupils are parasites on AI tutoring systems, their critical thinking ability reduces.
- Lacks human interactions during academic sessions as pupils are unable to train in social
- skills.

- AI increases unemployment because computers instruct and grade exams.
- AI in education has many financial issues.
- The absence of emotional intelligence in teaching and studying
- The students and teachers will become addicted to AI tools.
- The AI-accessed robots couldn't interact socially with each pupil.
- It reduces the critical thinking ability of learners.

VI. AUTOMATIC FACIAL RECOGNITION SYSTEM (AFRS)

AFRS is a Computer AI vision application installed in any learning ecosystem, which detects the real-time face and facial expression of the learners in real-time. These facial attributes are the representations of inner feelings and variations of the learners. The multiple emotional facial features of the mind are fear, happiness, concentration, sadness, satisfaction, and dissatisfaction. In a formal learning ecosystem and in any kind of educational activities various modes of video cameras can be used, such as surveillance and IP cameras or USB web cameras. The attendance of the presenters was also registered with the help of camera vision. Further, efficiency in various occupations - such as cleaning, catering, heating, or cooling can be undertaken without any actual supervision. Presently AI cameras are employed for safety and security reasons in the institutional complex. DeepFace and Luxand are the applications of AFRS.

VII. ENSURES PHYSICAL CLASSROOM CONDITIONS

The classroom physical conditions-light and temperature, occupancy space, and rate, are automatically facilitated by AI-monitored applications. If the classroom is too hot or cold, there is no sufficient lighting and ventilation, and there is no sufficient personal space and occupancy rate, then, the learners will not actively engage in the learning. The evolutionary AI-powered smart classroom applications infuse the Thermostat, Vision Camera, and LED which auto-regulate these physical attributes of the classroom to offer joyful learning of disciples in the learning environment.

VIII. AUTOMATE REPETITIVE TASKS

Sometimes in our daily teaching-learning occupation, some tasks are repetitive, which consumes more time duration to complete them. The AI-powered devices never get exhausted like a human being while functioning, in turn, this leads to high productive outputs. They operate as long as they are in good condition, augmented by relentless energy potential. The AI-powered system functions relentlessly without any hassle for any assigned task. The AI-monitored audio/video presentations, lecturing, vision, teaching/learning activities, and feedback mechanism, are automated and repeated without any interruptions.

- 1. Speech Recognition:** Speech recognition is an AI-enabled software in the computer, that recognizes human speech and translates it into text (speech-to-text) using natural language transcription data. Its main purpose is dictation and transcription. It identifies the words, models, and content of the speech/audio, later converts them into letters/numbers, determines the speech, and parses out the language. Instead of typing the text, this technology translates the voice into transcription in real-time. The speech-text-

software voice assistant technologies could be used for audio/voice biometrics instead of fingerprints or eye scanning.

- 2. Advanced Search Engines:** The chairman and CEO of Microsoft, Satya Nadella, quoted, “AI will fundamentally change every software category, starting with the largest of all – search.” Half of the queries unanswered out of 10 billion searched through the Microsoft Edge browser. The earlier browsers easily trace the weblinks but fall short to explore the content for complex queries. The recently launched preview of the crucial AI-powered updated featured search engines is added with new extension tools. Microsoft’s Bing, ChatGPT, and Google’s Lens, multi-search, and Bard, are available in preview to generate the content or curriculum of schools/colleges/ universities/research institutions using formats - text, image, video, understand the real world and mobile screen are productive as ever. The search engines, Bing and Edge act as co-pilots to the browsers to trace relatively more suitable and valid information, sometimes along with Weblinks.
- 3. Translation between Languages:** Now, dozens of AI tools have been developing translation features to exploit the translation processes in every nook and corner of the globe. These rapidly translate information from one language to another at any time for the learners and teachers. Whereas the quality of the translation varies with the translation machine. The Neural Machine Translation (NMT) of the AI machine incorporates the expressions, culture, and references to deliver the tailored product. Some AI machines translate into more than 100 languages. The features of translation are speech and real-time translation, translation of text, documents, and images, website translation widget, dictionary manager, glossary, collaboration tools, translation memory, app integration, multi-language translation, task delegation, tool integration, and many more. Google Translate, Bing Microsoft Translator, DeepL, and Reverso Translation are a few free software for AI translation.
- 4. Recommendation Systems:** The apps belonging to these systems identify the interested items of earlier activities of the end-user and then recommend similar types of items, products, and services. This covers social media services - YouTube, Facebook, Twitter, online retail services like Amazon and Flipkart, and streaming services like Netflix, Amazon prime video, Spotify, Disney, Tidal, and Apple. We can make the best use of educational activities and place orders using these recommendation systems.
- 5. Generative Tools:** Generative technology AI tools undergo the process of AI algorithms to create various forms of high-quality content such as text, imagery, audio, video, 3D renderings, synthetic data, etc., in a matter of seconds by using machine learning which understands the inputs, the data to deliver the output. Recently the most popular OpenAI’s ChatGPT, DALL-E, Microsoft Bing, Bard, and Opera, which are used to generate essays, poems, e-mails, social media captions, imagery, excel formulas, computer code, AI art, etc. These tools are extremely useful to derive multiple formats in the field of designing the curriculum, transaction of teaching-learning, deriving dimensions of assessments, and at all levels of education.
- 6. Computer Vision:** According to IBM, “Computer vision is a field of artificial intelligence that enables computers and systems to derive meaningful information from digital images, videos, and other visual inputs – and take actions or make

recommendations based on that information.” This helps to facilitate the stakeholders to understand the visions within a few moments which are unknown to them. This envisioned facial identification and emotional expression, accurate real-time object detection and their movement, recognition patterns of the materials, image segmentation, and recognition edges. The facial emotions of a pupil assist the instructor to navigate their presentation and enhance the evaluation procedures - formative, summative, quantitative, and qualitative in an automated way. Examples of computer vision are Google Translate, Creator, SentioScope, ImageChat, CamFind, BoofCV, Umbo CV, Facebook 3D Photo, YOLO, etc.

- 7. Grade Assignments And Quizzes:** The next level of evolution of AI is AI Automated Grading Technology for assignments and quizzes. It assesses hundreds of thousands of standardized tests from pre-nursery to university-level education systems. Scores are assigned to the responses, which are given by the learners like how the teachers are ascertaining the scores/grading. This is the feedback certainly making the process more efficient. It is still in the infancy phase used to automate the grading, ensuring consistency. As the AI assessment tools are promising, analyze the students’ learning potential history. Afterwards, provide them feedback quickly and accurately along with tailored learning materials. This helps the teachers to grade the quizzes, assignments, essays, tests, and examinations. For example, AI technology provides feedback on language grammar aspects – spelling and syntax. Hence it identifies the areas of weakness to realize the students’ efforts. This in turn engages the students to get motivated instantly to modify their preferences, learning styles, and performance data. The prominent essay graders are ChatGPT, Smodin Essay Grader, AI Grader, etc.

IX. CONCLUSION

Considering the aforesaid AI tools in the field of education there is a need for AI in the various verticals spread across all the levels of education. It is supplementary not only to the formal disciplines but also to non-formal learners. It augmented teachers to analyze the pupils’ learning disabilities, design the curriculum, and prepare lesson design, presentation, and evaluation. Its focus is already found in the development of infrastructure facilities in the institutional complex. AI tools would be easily accessed through hand-held devices such as smartphones, tablets, and iPad. This certainly helps the trainee-teachers to access it anytime and anywhere to imbibe smart instructional skills to become 21st century smart teachers.

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