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AI in Educational Management

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ABSTRACT

Artificial Intelligence (AI) is creating quantum waves in almost every field of learning, including education. The present times come with a lot of requirements that demand precision and patience, so as to be able to resolve impending issues on time, with minimum errors. That's where AI takes over to abridge the crucial need for problem-solving and apt decision-making in organizations. The role of AI has not been virtually defined in the books for educational management institutions, but is definitely not lagging behind in proving it's worthwhile and efficiency. Every technology comes with its share of pros and cons. Nevertheless, this research paper tries to address the application of AI in the educational management which strives to explore how procedures w.r.t student enrolment, engagement, retention, facilitating learning and achieving cost effectiveness can be explored. However, the flip side of the study also defaces the ethical bindings, biases that are ignored and the desperate need to have manpower enrolled into periodic sessions of training and development.

Keyword: AI, Education, Management, Educational Management's Future

INTRODUCTION:

From times immemorial, man has channeled human-life into being progressive and taking on complexities to harbor into machines for making it simple. AI is yet another tool that feeds the technological processes to acknowledge algorithms, neural networks that connect platforms to create the simulations that go on to leveraging the machine to aid in better problem-solving techniques to promote reasonable decision-making. Human-mind is a marvel construct of many such neural networks but often fall short of action that resides into timely resolution, multi-tasking and being coherent as machines in perspective would adapt to. AI is undoubtedly that miracle drug abridging the glitches in human-led systems, healthcare, finance, manufacturing, food and beverage to education. The backroads have successfully been used to get AI in the education sector to manage the ERP, CRM platforms, automate redundant administrative tasks and contribute much more lividly to the student-learners and employee relationship, has been a noteworthy one. This journey of AI in educational management has undoubtedly experienced its set of challenges and resistance to change.

Gone are the days, when an Organizational Change Agent proposed his/her suggestions for improvements, AI has dramatically taken over the role and many such criterions only to prove its efficacy and the mad-rush to meet the expectations in the changing times.

As per a recent study conducted by (Wadhwani & Bhutani, 2018) AI has debuted in education to cater into "Intelligent", "Adaptive" and "Personalized learning systems that are work-in-progress to meet the much-needed efficacy in schools and universities globally. The present market share is expected to upsurge to US$6 billion for 2024.

AI is probably the best bet in the imitation game (Turing Test) that man desires so much so that the margin of errors can be credibly reduced.

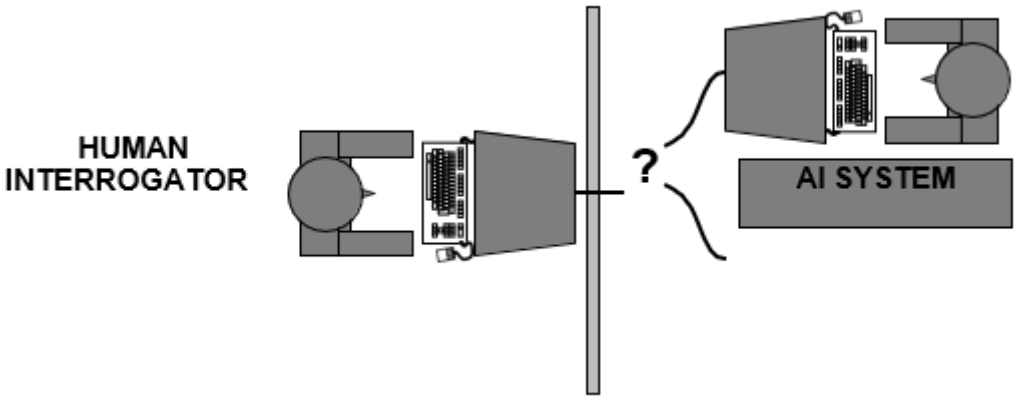

Fig (a) (Stuart, 2021)

The expected performance of AI in educational management comprises of the following roles;

✓ Retrieving & securing Knowledge
✓ Using reasoning
✓ Comprehending languages
✓ Understanding People requirements
✓ Connecting dots via Learning & imparting the know-how

Importance of AI:

AI can be effectively included in educational management to streamline the various processes and procedures that define the day-to-day functionalities.

Ranging from Present/Future Planning for the educational institution, Organizing the data in hand, Directing the role-players to help the end-users and Managing the discrepancies incurred. Since every educational institution is invested into due thought with defined vision and mission that highlight the objectives and goals to be met in due time. AI can be utilized to adhere into the needs and requirements.

Although many of the claims of the revolutionary potential of AI in education are based on conjecture, speculation, and optimism (Nemorin, 2021). AI's potential is still at testing – mobilizing – implementing stage for educational management. The idea behind utilizing a high-end tool as AI for comprehending the learning outcomes within a specific domain and cross-cultural set-ups, assessing the much-needed competencies and taking into account the mode of instruction in formal or informal context is crucial. So, we are looking at AI and its immense vastness to replace many processes that have either become redundant, lost efficiency and are infested with biases.

AI has several techniques that can be discussed in great lengths. This study briefly browses through them on the following features in Fig(b)

Relationship between AI ►Machine Learning ►Neural Networks► Deep Learning

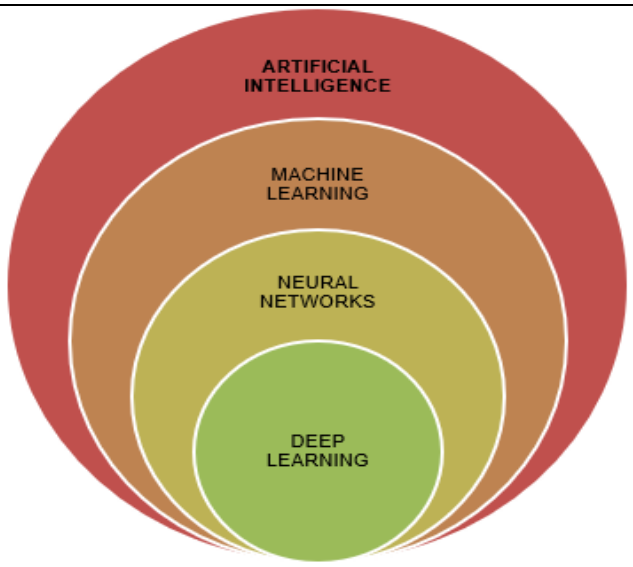

Fig (b) (Stuart, p. 2021)

GOFAI:

Good Old-Fashioned AI is also termed as rule-based AI, has conditional logical steps, writing sequences of IF …Then… statements that the computer works into and decides the final outcome. With due time, this was improvised as AI was found juggling several ranges of application-based portfolios and expert systems.

Machine Learning:

ML helps in identifying pictures, faces and make connections with impressions in the database. Natural Language process model, self-driving cars and advanced computational approaches also comprise as its anatomy. Algorithms are not programmed in this scenario but acts a student-learner and learns via data in hand, making connections with previous data or retrieving data from past and predicting the future values. Hence the approaches are categorically phased as – supervised, unsupervised and reinforcement learning.

Neural Networks:

On an average, the human brain has 100 trillion synapses, that's around 1000 per neuron. These neural networks carry messages while analysing and organizing assimilated information. An artificial neural network works on the same lines and is categorically divided into three types of interconnected layers of artificial neurons in a machine - Input layer, hidden/Intermediary computational layer and the output/delivery layer. The hidden/intermediary computational layers are the key role players in ANN, but come with their share of setbacks. The deep neural network may not lay out a clear-cut path for arriving at a conclusion.

Deep Learning:

Deep learning delves into varied approaches and is primarily the integral reason for the remarkable applications of AI in Natural Language Processing, speech recognition, image creation, computer vision, genomics etc. DL also thrives into the multiple intermediary layers of ANNs, emerging models called

DNN (Deep neural networks) that find effective mathematical operations to solve the input-data to the expected output data. Other than these networks, DL also browses into processing data from multiple arrays, recurrent data to flow in a linear way, sequential data and use two and three-dimensional computer vision.

Understanding AI & Its Emerging Trends in Education:

AI found its presence way back in 1960s when the educators and researchers started paving their way through use of computer and technology in order to enhance learning in the classroom. By 1970s and 80s, "Intelligent tutoring systems" (ITS) found its way into the classroom to support personalized instruction for student-learners. This was followed by NLP for students to learn language, helping the differently abled learners to learn language applications, to be able to interact with computer and eventually get a command over their linguistic skills in a comprehensive way. Early efforts used rule-based AI techniques to automatically adapt or personalize the learning to each individual learner (Carbonell, 1970, Self,1974)

The AI model that seemed to have been adapted was based on:

- ✓ **Planning Domain Definition Language** (Ghallab, 1998). PDDL is a factored representation.
  Later into the century, we were set into meeting the needs of situational crisis during Covid via:
- ✓ Online planning
- ✓ The need for a new plan: **execution monitoring**
- ✓ When there are **too many contingencies** to prepare for
- ✓ When a contingency is not prepared for, **re-planning** is required
- ✓ Re-planning is needed if the agent's model of the world is incorrect (missing precondition, effect or fluent)
- ✓ For online planning an agent monitor based on three approaches.
  - **Action monitoring:** before executing an action, the agent verifies that all the preconditions still hold.
  - **Plan monitoring:** before executing an action, the agent verifies that the remaining plan will still succeed.
  - **Goal monitoring:** before executing an action, the agent checks to see if there is a better set of goals it could be trying to achieve(Russell, 2021)

However, this very notion of adaptive practices involving AI in education, highlighted the issues brewing in pedagogy, organizational structures, access to pertinent information, ethics and principles, equity and sustainability to be automated. This revelation promoted the facets behind the design of how education is structured and the need to be consistently reviewed, to be revamped, to rebuild the foundations and address the sustainable developmental goals for the future learners.

Certain criteria were set ahead of the planning committee that identified a set of four needs-based categories of emerging and potential applications:

- ✓ Education management and delivery of the pre-determined goals
- ✓ Enhancing the learning and assessment methodologies
- ✓ Ways to empower educators so as to facilitate learning and teaching practices
- ✓ Promoting a healthy mindset to develop a lifelong learning eagerness.

Role of AI in Educational Management:
As discussed in this research study, AI has transitioned slowly but surely from 1960s to 21st century in the educational context. It may not be evident in many parts of the globe yet the profound use of AI for student-learners with varied learning styles, due to lack of training and know-how. All the same, the educators and student-learners of various learning abilities can stand to get the best value-addition from AI and its significant role in education.

Customized Learning:
Generating IEPs for the SPED learners and also for the gifted and talented via the effective use of AI in the classroom, can help teachers to redirect learners in the right direction and save time.

Evaluation based on competence:
Testing student-learners as per the abilities or level of understanding so as to support learning in a wholesome way rather than rote learning.

Assistance:
Providing 24/7 assistance via chatbots and virtual assistants that have valid data to support and impart solutions to the queries of the student-learners or inquisitive folks.

Redesigning Classrooms:
Making sure that the classrooms have a facelift towards collaborating across-domestic and international platforms and help in building robust classrooms designated to support learning in virtual context as well.

Automation:
AI can be used to simplify the repetitive practices that fall under the administrative guidelines for an educator. Responsibilities such as grading, scheduling, attendance monitoring, and report generation can be effortlessly be replaced by AI, while the educators can utilize their time for enhancing their skills-set in training and development sessions.

Analytics:
AI can be used to collect data on student-performance, learning outcomes, participation in activities and help in analyzing the learning patterns of the student-learners. This can also identify the student's gray areas, gaps in learning and help in future predictions.

Predictive Analysis of AI in Educational Management:
AI is here to stay and it's not based on choice or preferences. Although there are many challenges and drawbacks that AI comes with, yet the key is to manoeuvre accordingly towards the anticipated goals in an educational institution with the chosen priority. The pandemic brought about the unexpected objectives that weren't met on account of missing the offline rote learning mode in many parts of the world. AI was reborn to address caulking the loopholes and value the time in hand to impart learning to the end users. Evidently over the past decade, the use of AI tools to support or enhance learning has grown exponentially (Holmes et al., 2019).

AI is set to take on the future with its tools and techniques that are weaved into understand how a learner learns, measure the skills-set, evaluate the learning outcomes, have tailor-made assessments for varied learning styles, replace redundant administrative processes in educational institutions so as to swipe away the stress factors and invest time in training and development practices instead, concentrate on delivering quality curriculum to the end user, help in budgeting finances, create a positive work culture, promote retention of overwhelmed employees and hopefully build a well-rounded wholesome leader at every organization.

Educational Management is not a joyride that could rely solely on a few parameters that primarily follow a predetermined protocol which is rudimentarily wasted. Leithwood, Seashore Louis, Anderson, and Wahlstrom (2004) have a strong opinion that effective leadership is critical for the success of educational institutions. A visionary leader has to have the inherent grit to debate the critical needs for an organization, especially for the learners in an educational set up. Having predefined clear set goals, invest time and energy in training and development of the employees, working into the 5C's of Efficacy and adhere into the feedback and supportive measures for the educators and staff - in practice- Fig(c)

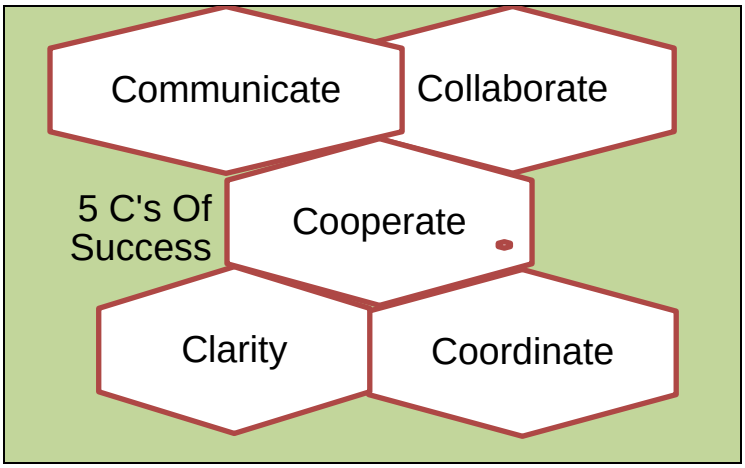

Fig (c) (Leithwood, 2004)

Conclusion:

AI will dominate the educational sector in the upcoming days. It is fundamentally believed that AI will serve as an integral element on transforming education. This technology can help in reducing the cost of learning, help student-learners to do better on reading, writing and mathematics, globally. (Clark, 1986, 2005) . It has also been noted that through studies, that efforts have been made by small startups in finding better solutions in learning for children with/without challenges via AI. This program ensures that the scalable solutions can be mapped in 15 months, wherein the children are enabled to learn themselves. Education is a bit of a slow learner as suggested by Mr. Clark in his book, "*Artificial Intelligence for Learning*". His book brags about how AI can be utilized for recruitment of students, the induction process can be made simpler into colleges and universities, sending periodical reminders on assignments due or past-due, evaluating lengthy written papers or mathematical theorems and based on their performance-levels award them with scholarships and due recognition.

Technology has been lavishly utilized by major leading organizations in their partaking on a daily basis, to save time and achieve efficiency. Robotic teaching assistants were deployed in an experiment at Georgia

Tech and this seemed to have had a phenomenal effect on learning by the student-learners. The family of bots in aiding education and learning is not limited to certain norms, as the ancestors Alexa, Siri, Cortana etc carry the baton to discover more options. Humans can be less productive whenever they are not in collective spirit, unwell and lost in general sense, that's the turning point for AI to take-over and assist the end-users as a whole or based on individual preferences.

In a way, the 1-0-1 digitalized learning would make AI a more preferential tool for many learners. The future of AI would depend on the needs and requirements of the end-user. Based on the immediate needs of the end-user, AI will be subject to cater the candidate/s with the service or product. Virtual reality and augmented reality would be generically explored more through AI and its related technologies. The pen and paper ritual would eventually lose out to AI tools that weave a better platform for higher education in technology. Utilizing the available space time in hand to upskill and learn advanced NLP would aid in having smooth conversations across the globe.

Advanced learning brain-computer interfaces can stir in the learning program, which will eventually sustain on its own, survive on paying itself in cost and almost achieving the end-goal. Education will transform to a vacational concept versus vocational in general belief (Chace, 2020).

AI has a bright future in Educational Management provided every leader of each educational institution is wisely invested in reaping the best out of the tools and techniques that AI has to offer. At the end of every game plan, the productivity is bound to be measured in compliance with sustainability that spells out learning, empathy and due regards to humanity.

Life does not come with shortcuts but AI stresses on that inadvertently. Keeping into account the blessings that AI brings into managing an educational institution, it is imperative to acknowledge the ethical limitations, values and principles embedded as human entities so as to restrict the annexation of functional domains and yet manage to secure human-relationships and define responsibilities.

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