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ROLE OF MACHINE LEARNING IN SOLVING DISRUPTIONS RELATED TO E-LEARNING PROCESS

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Abstract:
Machine learning techniques, essentially employ statistics to identify patterns in massive amounts of data including words, numbers, images, and other forms of data, carry out all of those tasks. To address specific problems, a machine-learning program can employ data that can be digitally saved. The data analysis employed a multiple regressions model to identify the key variables that affect whether delighted both students and teachers are with e-learning. E-learning has emerged as a result of the widespread adoption of the internet, various information and communication technologies, and distant learning. Machine learning (ML), which is transforming learning, has a significant influence on learners, knowledge, and studies. Educators are employing ML to recognize challenging students proactively and take the necessary steps to boost retention and accomplishment. To make fresh findings and get additional insight, academics are expediting their research with ML. Machine learning (ML) techniques are now frequently utilized to assist in solving practical issues based on statistical information. E-learning methodologies are a cutting-edge approach to education and learning in the digital world.
Index terms: Machine learning, E-learning, Education strategy, Digital transformation, Accountability, prospective teacher educators, Higher education, Technology Enhanced Learning Environments.

Introduction:
Consequently, administrators and learners are forced to change to online courses. Students have been particularly difficult by the negative effects and academic problems caused by the lockdowns instituted by government agencies to manage the outbreak. Machine learning also becoming more widespread and has been used in teaching to student modeling for smart tutoring systems, forecasting students' results, enhancing teaching methods, and proposing higher learning students courses. E-learning tools are useful for improving the educational platform's skills and competencies, including teachers, pupils, support personnel, and anyone looking for up-to-date knowledge about different educational institutions. E-learning, which incorporates web - based learning, is another name for all types of technologically devices connected that are used for learning through the internet. By making on-the-go education the standard, the idea of e-learning has completely revolutionized society [1].

E-learning is a recent method of education that seeks to enhance learning and teaching methods in online settings [2]. E-learning is described as a teaching method that uses a smart device or online technologies to impart knowledge and aid in the facilitation of learning. Recent advancements in machine learning have the potential to improve or revolutionize education, and this prospect has consequences for what students and educators need to know about using these systems in the classroom[3].Education through communication infrastructure, including e-learning developed by colleges via university internet sites or even using application forms, is one possible learning paradigm, coupled with the current state of the COVID-19 epidemic [4].

Currently various sectors are adopting AI, which comprises ML and DL for accurate data analysis and the operational optimization [5].In order to access online educational or educational resources, information and communication capabilities are used in e-learning. Considering that a student's insufficient involvement leads to a high drop - out rate, when evaluating student interactions in VLE independent learning and determining students' degrees of involvement in VLE classrooms, the best Samples suggest model was selected[6]."Additionally, supervised and unsupervised machine learning techniques are used in substance and conceptual qualitative data analysis" [7].
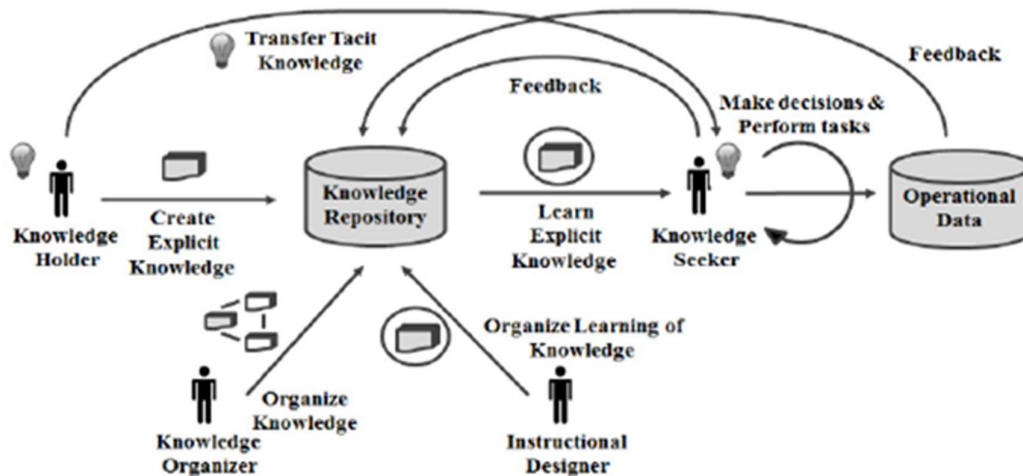

Fig. 1. Main steps of knowledge creation enhanced by e-learning

Concurrent teaching materials, quick technological advancements, time management, feelings of isolation, learners' variety, and international aspects and difficulties are only a few of the characteristics of e-learning [8].A effective tool for the both adaptability inside intelligence e-learning techniques and enhancement of instructional contents for educational technologies could be practical evaluation for e-learner understanding of On screen knowledge [9].In addition, the innovative and complex machine learning algorithms on which advanced analytic systems are built are to thank for their success since they enable the quick processing of enormous amounts of information[10].In order to represent the favoured modalities identification as a machine learning issue, learner's contextual characteristics must be extracted from the information. On the basis of these learner-interaction inputs, a sequentially machine

learning algorithm may be taught always to evaluate the underlying expertise of a learners and then the matching understanding [11].

Literature review:

Different methods are used in the literature to assess crucial success factors for e-learning systems.

Ramzi Farhat et.al 2020 described by "Artificial intelligence has a significant impact on e-learning development, and technologies improved learning contexts can be improved using machine learning-based methodologies". To enhance the educational experience, e-learning experts have put a lot of work into evaluating learners' data using ML techniques. Hence the growth of continuous learning, educational systems are being forced to fundamentally modernise, and e-learning is gaining ground. In fact, the analysis of complicated data using machine learning techniques has become a significant trend in many scientific study fields, including health, teaching, business, and banking, among others [12][13].

Valentin Kuleto et.al 2021 explained by ML and AI are technologies that enhanced from data management and creating procedures."Machine learning is a branch of AI and computer sciencewhich focuses on the use of data and algorithms to imitatethe way that humans learn, gradually improvingits accuracy". Consequently, e-learning and advanced educational establishments have a lot of promise for using AI and ML. Additionally, utilising the newest AI and ML approaches permits the creation of new technological innovations that would take ten years to build in a relatively short period of time. "E-learning is the acquisition of competencies, knowledge, and skillsthrough electronic media, such as the Internet or acompany Intranet."[14].

Zeinab Shahbazi et.al 2022 demonstrated byApplication of machine learning analysis methods to enhance recommendation outcomes in an online educational setting. The system contrasts several feature selections and machine learning algorithms. A set of guidelines is one of the essential elements of a system for machine learning. The importance of the aforementioned method in the e-learning system is expanding daily, and specialists are attempting to discover answers. Most scholars focus on the instructional recommendations platform model on education-related technology when looking at the importance of the e-learning system.To overcome the constrained user evaluation issues and enhance the functionality of the e-learning platform, employ agent-based recommendations. "A system that recommends appropriate educational content to a student contextual information that has been gathered from the student is called a fuzzy logic-based context aware recommender for smart E-learning contents recommendation"[15][16][17].

Abdulla Alsharhan et.al 2021 evaluated by recent research indicates that the most popular techniques for developing statistical models for classification and predicting problems are supervised machine learning techniques whenever it regards to accuracy educational considerations. One of the difficulties was that, although retraining using the same information, the machine learning outputs varied from attempt to attempt. Given that machine learning models often exhibit higher accuracy with much more training examples, this might be caused by the comparatively modest amount of the data. This method's objective was to assess and comprehend each ML model's attributes.The most significant factors that might affect learners' academic achievement have been discovered, and we have demonstrated that e-learning

characteristics alone are adequate to predict the dependent variable objectively. In these situations, descriptive statistics or machine learning best show the possibility of analysis on a larger dataset [18][19].

Feiyue Qiu et.al 2022 presented by The efficiency of different methods of machine learning and algorithms can change, and this performance variation may be affected by the preprocessing of the accessible input data. Between these, the processing of big and complicated data using machine learning techniques in the context of classification methods in the educational setting can be utilised for prediction analysis, including the predictive of test results for students. Learning ability and e-learning habit are significantly correlated. Cognitive approach, affective computing, machine learning, and pattern matching methods are all combined in e-learning with an expressive interaction feature [20][21].

Methodology:

E-learning is instruction provided over the internet so that people can communicate and learn knowledge [22].A contemporary method of training is an online course that allows for continued interaction between a teacher and a student, monitors the quantity and quality of educational resources obtained, efficiently manages all training-related tasks, and flexibly adapts to the necessities of both student and a teacher [23].

Five Ways of Machine Learning Application In e-learning:

1.   Advanced Analytics:

In a system that employs machine learning, large amounts of information may be managed, and insight regarding trends and themes can be found.

2.   Chatbot Q&A:

Through the use of ML chatbots, users can get knowledgeable responses and maintain their knowledge. While some other ML technologies can be compared to chatbots, they are not only confined to answering questions. Thanks to chatbots that include AI, pupils are able to ask questions at any stage. In the classroom setting, the instructors never get tired of answering questions.

3.   Enhances Interest in Learning:

Students' ability to learn is improved through machine and e-learning. Numerous learners can now engage more effectively thanks to the introduction of independent learning made possible by machine learning. The children become more engaged and motivated as a result. Machine learning can help solve complex problems in addition to numerous ways of enhancing the eLearning experiences.

4.   Returns With Quick response:

Students and professors are occasionally overworked with assignments and due dates. Students may be irritated by the unexpected response and experience a delay in finishing their task. This causes delays and a backlog of work. Educators or students can relieve themselves of this strain with the use of machine learning. They give the learner immediate feedback and give the situation some forward motion.

5.   Several types of Assessment:

Machine learning enables the presenting of queries in a wide range of formats, such as an essays or a lengthy addresses topics. The machine employs a number of algorithms to determine the

pupils' scores. Standardized tests are also incorporated into machine learning to assess a learner's understanding.

Comparative Analysis:

There have been numerous e-learning technologies available to enhance the standard of online learning. In this part, researchers contrast some of the most recent methods with the agent-based e-learning environments that is suggested in Fig. 2.[15].This strategy was developed using four ensemble approaches and five conventional machine learning algorithms.
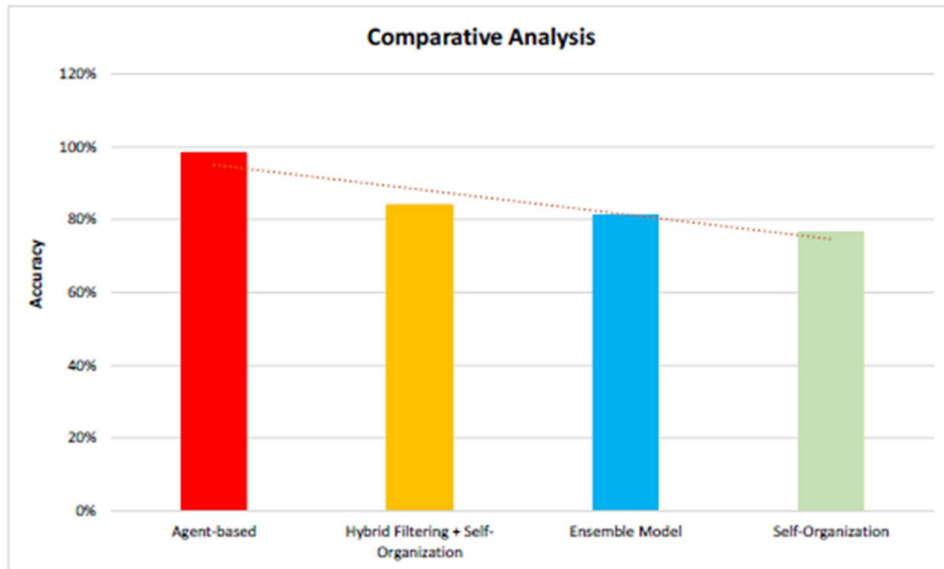

Fig.2. Comparative evaluation of current methods in the e-learning context.

This suggests that during the existing COVID-19 epidemic, the majority of the public's thoughts and attitudes on online learning were concentrated on "learning assistance," "COVID-19," "schools," "remote learning," "e-learning," "students," and "education" (Fig.3.)[7].
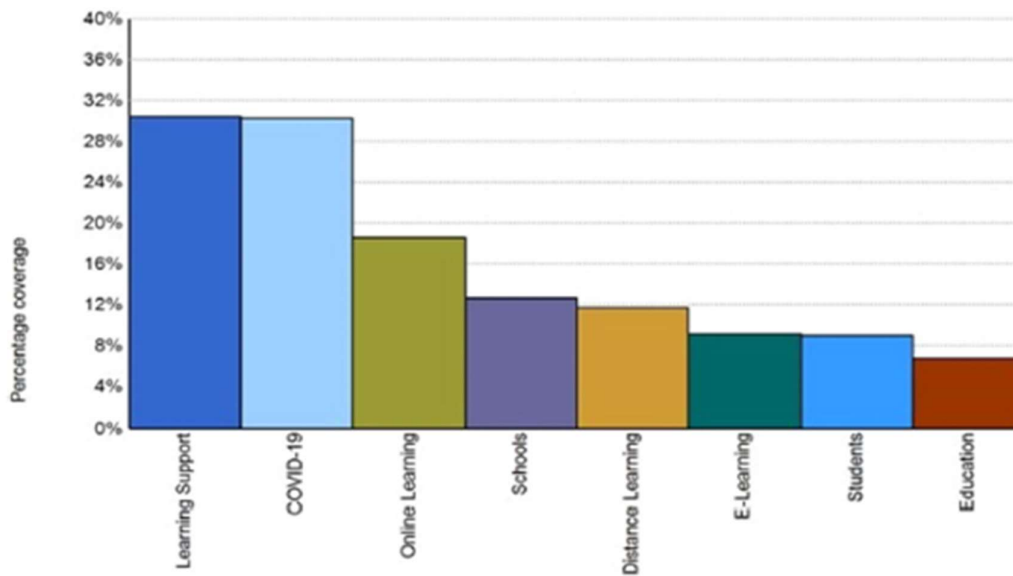
Fig.3.Observed themes for learning techniques

Conclusion:

In order to meet the requirements of a diverse range of learners, the use of effective education innovations provides accessibility to educational materials including online courses, m - learning, distributed learning, virtual classrooms, and cooperative learning strategies. Machine learning, a high-end innovation, is the icing on the cake for many tasks, particularly in eLearning. ML has already made incredible advances, which have considerably improved online visibility.Therefore, for their huge information accumulation, future developments are appealing to the web's E-learning and ML capabilities.E-learning studies are distinctive in that it frequently integrates a digital tool to the learning outcome that is very recently developed. Various adaptation and integrating techniques are used by models as a result of various organizational goals and needs. Integrating on a common ground—learning—was chosen as the more proper approach.

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