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E-LEARNING APPLICATION WITH MACHINE LEARNING

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Abstract
Machine learning has entered many fields, one of which is e-learning. E-learning has many applications that depend on it. These applications were designed and based on machine learning algorithms. This study surveyed the most critical applications based, designed, or created on machine learning algorithms' principles. Also highlighted are platforms that have more tools empowered by machine learning, like chatbots, recommendation engines, and adaptive quizzes.

Keywords: e-learning, machine learning, platforms.

Introduction

E-learning is the delivery of learning and training through digital resources. A learning management system (LMS) is one of the digital resources [1]. A learning management system (LMS), also often referred to as learning management software (LMS), is an application or a web-based interactive system that stands as a tool to administer, conduct, and assess a learning process. Therefore, prof or the teacher can create and circulate curriculum, check student participation, and appraise their scores [2]. Many platforms (LMS) exist, such as Blackboard, Moodle, Canvas, Bright Space, Google Classroom, etc.

There are two types of platforms for LMS: proprietary and commercial/open source. There are various open learning management systems such as Moodle, Sakai, ATutor, Claroline, MyGuru2, and MyLMS. While for example, commercial LMS examples include Blackboard, SuccessFactors, SumTotal, Litmos, Angle learning, Geo learning, Cornerstone, and Connect Edu might have some value on the market, they cannot be generalised and may seem incomplete [3][4].

Machine learning links to the concept of the pursuit of the ability to learn through the smart – without being explicitly given a program [5]. Classification, regression, and clustering are integral components of Machine Learning, each serving distinct purposes in data analysis and prediction [6].

Computer science background depends on different algorithms that turn a specific process into a program. These are the most of the ML algorithms that are truly used in machine learning (ML). Feeding machines with example (input-output) pairs is supervised learning among machine learning tasks[7] . Supervised learning, which is a group of algorithms, has models such as Decision Tree, Navie Bayes, and Support Vector Machine.

Out of Unsupervised Learning here, these are termed as unsupervised as they don’t have a correct answer and they also don’t have a trainer [7]. Unsupervised learning has many algorithms like K-Means Clustering, Principal Component Analysis.

In addition to that, machine learning has built many learning methods and an algorithm tree that covers the areas like Semi Supervised Learning, Reinforcement Learning, Multitask Learning, Ensemble Learning, Neural Networks and Instance-Based Learning.

Yet, this is not the only field of the business where there is the massive use of the machine learning, many of them are education related. Some of interesting areas are: Policymakers, Instruction Providers, and Instruction Receivers would be the main beneficiaries since the technology would help them to; Predict Student Performance, Test Students & Grade Students Fairly, Improve Retention, Support teachers and institution staff [8].

APPLICATION OF AI - MACHINE LEARNING IN E-LEARNING

1. ADVANCED ANALYTICS

Some ML-based solutions incorporate machine learning algorithms into data analysis of education or data on learning and help policymakers and educators to gain actionable insights to better the learning experience. Such technology encompasses a variety of tools such as eLearning platform's recommendation engines, adaptive applications, software that provides data analytics of student performance. Through machine learning, the tutor, or the teacher reaches deeper or more detailed knowledge concerning the tasks the student successfully performs. They are provided with information about different aspects of learning such as the learning rhythm of a student or their strengths and weaknesses. This is the very significant one to take action and for the learner who is being directed through the plan given the next step [9][10].

2. CHATBOTS

AI-programmed chatbots are an exclusive and growing trend for a number of companies have adopted them to answer questions or deal with issues they might have. Automated machine learning chatbots allow students to navigate the guided answers in the specified sequence. In fact, chatbots can be treated as the best machine learning equipment developed for the purpose of superior intelligence. However, they are not limited to answering inquiries. AI-powered chatbots equipped with students' questions resources help students to continue the learning-questions process continuously. Unlike real instructors who lose patience quickly when answering the same question from numberless students, virtual instructors never get tired. Chatbots are able to carry out the pedagogical and administrative functions, which includes suggestion eLearning content, interact with students via quizzes and issues, and control online learning community, and present facility, which are accessible to students anytime [9][10].

3. INCREASES SENSE OF LEARNING

In machine and online learning, students' learning effectiveness will strike up from the depths. The role of machine learning is accentuated by the make of AI learning; hence the students get engaged in almost every activity. It brings the motivation level of students to a higher level as well as their participation in the education process. Students will have an option of career that fits them. The fact that a student can be able to learn what they need and also have a better career opportunity in life because of this. In the other aspects, the machine learning Assists to reinforce learning Experience; here it tenderizes solving of hard problems [9][10].

4. RETURNS WITH IMMEDIATE FEEDBACK

At times a tutor or teacher has to bear numerous tasks and is hard pressed to meet the deadlines. They may be highly stressed and not getting back to their students in time without hearing those students complaining because of the delayed feedback. Raising the burden on the processor, more jobs are pending behind.

Machine learning can ease it out by writing lessons themselves or at least presenting them themselves to the students. They significantly expedite the process by enabling instant feedback, and they serve as the driving force towards compliance [9][10].

5. MULTIPLE ASSESSMENT FORMATS

Multiple-choices is a get-go score shop. Teachers tend to make them the most convenient tool they can use in the classroom. Machines can be trained to respond to multiple factors, so machine learning has actually made the processes of diagnosing and treating even easier. With the help of artificial intelligence, the questions will be presented via other formats such as vague and long responses or essays. The machine uses various algorithms in addition to the score of the students in its assessment.

Text analysis as for examining essays has become a present-day clever gizmo. They earmark the importance and strength what is presented in that essay. Machine learning as well applies the usage of check quiz for better evaluation of a learner intake of information. As the history of the future progresses, there will more and more breakthroughs. Multiple-choice questions and quizzes are supposed to be more prompted in processing time [9][10].

POPULAR MLS ELEARNING PLATFORM

1- MOODLE

Moodle is an open-code learning management system, which contains course management, assessment, and evaluation tools. Moodle perfectly fits the need as it covers several languages, hence it is usually the first choice for colleges working with multi-language audience.

Just like that, one of the most admirable characteristics of Moodle is the fact that its rather large developer community is always hard at work tending to the platform.

The goal of machine learning in Moodle tutorial is Predicting a prepared forecast model, educating machine learning algorithms using already stored data and inferring everything based on previously implemented algorithms.

The machine learning backends of Moodle content are made possible by the PHP backend, which is based on logistic regression, and the Python backend is based on the general consensus opinion of our learners and uses the Google's tensorflow library and a feed-forward neural network with one single hidden layer.[11][12].

2- BLACKBOARD

Blackboard is an LMS which was considered as a popular platform from more than twenty successful years. The main features of this gravitator are course administration, content development, and tools for interactions with students.

Besides the different analytical tools provided by blackboard, educators can also use these as someone to help them analyze the level of their students' achievement and address the areas of improvement. Furthermore, one the main advantages of the Blackboard is its scalability, which presents a smart choice for colleges of all sizes.

There is support for many tools on Blackboard as ML (Machine Learning), AI (Conversational AI), DL (Deep Learning Algorithms), IAB (Institutional Answer Bank), CS (Continuous Synchronization), SO (Supervised Learning), EO (Escalation Options), among others [13].

Blackboard, a machine learning technology, is a Chatbot that can extract data and use it to predict and learn outcomes. The fact the Chatbot can do all that without being programmed to do tasks means the Chatbot is continuously adjusting its responses to be more precise.

3- CANVAS

Canvas is LMS which is made by Instructure Inc. Canvas is a cloud-based platform which contains features like course management along with grading and assignment management too. Customization is one of the powerful, potential tools that Canvas gives to instructors. Educators are given the ability to customize the platform to fit their specific needs.

Canvas's neat user-friendly interface is the feature that defines it well. Therefore, the platform is not difficult for both those who teach and the students who are learning.

4- GOOGLE CLASSROOM

Google Classroom is a cloud hosted LMS that connects with Google's suite of productivity products which will help to save Google Docs, G Drive, and to manage Google calendar.

The product is designed for use in K-12 schools as well as in higher education institutions that provide platforms for courses/assignments creation and communications management. Instructors' users may just create and distribute teacher's guidelines, tests, and examination questions, or respond to the students' needs by giving them feedback and scores.

5- ABSORB

It's an in cloud LMS (Learning Management System) for enterprises, organizations, or academic institutions. It has a simple course creation system, customized authoring tools, reporting and analytics for conducting assessments. A LMS suite we offer possesses diverse multimedia forms, for instance, movies, animations, and quizzes.

Engagement and motivation are the two drivers of this platform, so it includes features like "badges" and "leaderboards". In addition to this, LMS readily unites with a number of other applications like Salesforce, Zoom and Shopify just to name a few. This factor depends on the size of the organization and which characteristics are needed to be delivered as a service.

Intelligence Sensor, is an AI-based skill-set that eliminates admin tasks and enables students to concentrate on developing new skills and areas of study. Connect learners with news they'll enjoy, amplify search discovery, and bring administrative ease of use, everything with powerful AI and language recognition technology. An AI-exclusive AI branded technology product of the Absorb LMS has the Intelligent Assist, Intelligent Recommendations and Intelligent ranking [14].

6- D2L BRIGHTSPACE

D2L as the maker of Brightspace, a cloud-hosted software product, is in widespread use on school campuses, in higher education institutions, and in business environments as part of their blended classroom learning and online learning initiatives.

What differentiates Brightspace from competitors is the fact that it supports all types of students with various learning styles and techniques. Adapting the learning course according to the student's needs is a real concern of this learning management system. By its status agents, it watches students' behaviour and provides learners with personalized routes using machine learning methods [15].

Table (1) features of MLS

MLS	KEY FEATURES
Moodle	Personalized learning, Automated grading
Blackboard	Personalized learning, Automated grading, Intelligent tutoring, Adaptive learning, Performance tracking and reporting
Canvas	Personalized learning, Automated grading, Intelligent tutoring, Adaptive learning, Performance tracking and reporting
Google Classroom	Personalized learning, Automated grading
Absorb	Learner Engagement, Artificial Intelligence, 24/7 Support, In-Depth Reporting, Course Creation and Curation, and more
D2L Brightspace	Personalized learning, Automated grading, Intelligent tutoring, Adaptive learning, Performance tracking and reporting

CONCLUSION

The role of AI-based teaching in education is being developed and improved all the time. The MLS tools have more inputs coming from machine learning; they include chatbots, recommendation engines and adaptive quizzes. It is a machine learning algorithm that is the most important one to understand. Moreover, its primary and most important application area is probably in educational platforms. Furthermore, the piece stresses the most significant social networks for those users.

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