Humanities and Educational Sciences Journal
ISSN: 2617-5908 (print)
مجلـــــة العلـــــوم التربـــــوية والدراســـــات الإنســـــانيــة
ISSN: 2709-0302 (online)

A Review: Study on Students Learning Disabilities Based on Education System Using Artificial Intelligence(*)

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*) تاريخ تسليم البحث 9/5/2024 تاريخ قبوله للنشر 5/6/2024
*) موقع المجلة: http://hesj.org/ojs/index.php/hesj/index

دراسة حول صعوبات التعلم لدى الطلاب في ضوء نظام التعليم باستخدام الذكاء الاصطناعي

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الملخص

خلال السنوات الأخيرة تزايد استخدام تقنيات الذكاء الاصطناعي والتعلم الآلي بشكل ملحوظ في جميع التخصصات نتيجة للتزايد المستمر في حجم البيانات بالإضافة إلى المتطلبات المتغيرة للتعليم العالي، مثل تلك المتعلقة بالتعليم الرقمي. في العديد من البلدان حول العالم، أصبحت صعوبات التعلم (LD) مشكلة كبيرة يمكن أن تعيق التقدم في الأداء.

تسعى الدراسة حالية لمساعدة المنهج المحدد لإدارة الأنظمة في مهمته لموافقة النموذج المعياري. في الوقت الحاضر تستخدم العديد من المجالات المختلفة التعلم الآلي للتنبؤ بالنتائج المستقبلية. يعد التنبؤ بصعوبات التعلم لدى الأطفال، وكذلك تحديد الإعاقة الفعلية ومدى اكتشافها مبكرًا، من بين أكثر تطبيقات التعلم الآلي فائدة.

هذه الدراسة تمثل نظرة عامة لفهم العمل الذي تم إنجازه في هذا المجال سابقًا حتى هذه اللحظة ومحاولة فهم الثغرات في تنفيذ نماذج الذكاء الاصطناعي المختلفة، كما تعتمد المراجعة على نظام المدرسة الذكية عن طريق التفكير الاصطناعي. تؤكد الاختبارات التي لا تعد ولا تحصى أن التعلم يتم على افتراض أن أنظمة العرض تتوافق مع أساليب التعلم للطلاب، مما يجعل التجربة المتنامية أكثر إقناعًا ومواصلة تطوير عروض الطلاب.

الكلمات المفتاحية: صعوبات التعلم، نظام التعليم الذكي، الذكاء الاصطناعي، التعلم الآلي، استراتيجيات التدريس.

A Review: Study on Students Learning Disabilities Based on Education System Using Artificial Intelligence

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Abstract

The application of artificial intelligence and machine learning techniques has grown significantly across all disciplines in recent years as a result of ever-increasing volume of data as well as changing demands of higher education, such as those related to digital education. In many countries around the world, learning disabilities (LD) are becoming a major problem that can even hinder performance progress. The endeavor of this work is to assist the specific program with systems administration in their assignment to accompany the norm. Nowadays, many different fields use machine learning to predict future outcomes. Predicting children's learning disabilities, as well as determining actual disability and how early it is detected, are among most useful applications of machine learning. This review article aims to comprehend work done on this field previously, up to this point and attempt to comprehend the holes in execution of the different AI models and the review depends on intelligent school system by artificial reasoning. Countless examinations validate that learning is worked with assuming showing systems are as per understudies learning styles, making the growing experience more compelling and further developing understudies exhibitions.

Keywords: Learning Disability, Intelligent Education System, Artificial Intelligence, Machine Learning, Teaching Strategies

Introduction:

Human behavior relies heavily on the process of learning. It assumes a critical part across the human life expectancy. This causes us to reflect and raises the issue of learning's purpose and nature. The problem of the young person who experiences issues in learning is not new. Focusing on the diverse students in the Inclusive classroom, we find that many of the children have a variety of learning issues that hinder their academic performance. (Song, CAI, Yang, Yang, & Liu, 2022). One of these is what are called "Specific Learning Disabilities," which are invisible and often misunderstood even though they affect a wide range of students. The improvement of learning inabilities as a field of a custom curriculum followed an alternate way. Over the most recent couple of many years, another influx of significant examinations on human improvement has arisen, covering a large number of points. The developmental approach, which aims to help children realize their full potential, has been the focus of many of these. Children with Special Needs, the most underserved population, have come to the forefront. Explicit Learning Inabilities are a generally new area of exceptionality that has been recognized, proposed and characterized. (Chakraborty, 2019). Since most people with Specific Learning Disabilities have average intelligence but struggle in academic areas like reading, writing, and math, it has typically been categorized as a "mild" handicapping condition. However, recent thinking suggests that Specific Learning Disabilities is a "generic label" for a very diverse group that encompasses everything from mild forms of retardation to socio-emotional changes, language difficulties, subtle clumsiness, and most importantly, reading disorders (Tharsha, Dilogera, Mohanashiyaam, Kirushan, Chathurika, & Swarnakantha, 2021). There is a variety of students in every classroom who do not fully benefit academically from the standard curriculum and require holistic support and intervention. Learning inabilities could emerge for various reasons. One of the significant one being neurological contrasts in mind construction and capability. A learning inability influences individual's capacity to understand data one gets. Understanding the idea of these disorders is extremely challenging. However, mapping specific brain regions and structures as well as some of the challenges faced by learning disabilities has made significant progress (Poornappriya, & Gopinath, 2020). A person does not have a learning disability if they have some visual, hearing,

or motor impairment. Indeed, even mental hindrance, close to home unsettling influence, social elements is additionally not portrayed as learning handicap (Caspari-Sadeghi, 2023).

Objectives of the Study:

The present study aims to:

a. Investigate the learning difficulties based on education system using artificial intelligence
b. Explore the influence of artificial intelligence to overcome the LD in the educational system.

Problem definition:

Learning handicap youngsters experience social and profound issues as a result of their challenges. Through its writing system, culture influences dyslexia as well. Poor academic achievement is correlated with socioeconomic status. Learning crippled individuals are liable for a significant extent of offenses on open and kids. Changes in the modern family have a significant impact on the abilities of children with learning disabilities. A child is at risk if they are exposed to harmful pollutants. Negative environments typically restrict cognitive functions. These examinations are of western setting that to generally in created nations where the school systems have taken a lot of care about the learning crippled. Only a small number of studies have been conducted in developing nations where the educational system has not been fully developed to meet the requirements of various social groups. Another striking thing is that despite the fact that, India is an emerging nation where the schooling system is concentrating its level best to give equivalent instructive chances to its populace, concentrates on learning inabilities are not completed. There may be a few studies, but they are not properly reported, which is unfortunate. The review's limited Indian studies may be attributable to this. It stands to reason that children with reading, writing, spelling, and arithmetic difficulties in primary school naturally lose interest in attending school. There is every possibility that concepts like waste, stagnation, and dropout will continue to dominate the educational landscape in India if these issues are not properly identified and addressed. In addition, it results in the failure to achieve educational objectives like 100 percent literacy and universal elementary education. To avoid this, proper diagnostic tests in English reading, writing, and

spelling must be developed so that children's difficulties can be identified early on, making it easier to enroll in certain remedial programs.

Many AI calculations are utilized in foreseeing the learning handicap among kids. The ability to handle such situations improves the earlier the prediction is made. A comparison of existing machine learning algorithms can be used to determine which one accurately predicts a given set of data. The step of preprocessing the data prior to prediction is crucial. A few new procedures can be formalized which will help in giving better expectation results.

The following researchers have used neural networks to identify learning styles: Table 2 (Shaikh, et al, 2022). Provides a summary of some of the most recent research that has been carried out in this field.

Method Used	Description
Furry classification	**There is no comparison of the classification's outcomes' precision and accuracy.**
***K*-means clustering**	**The research sought to understand students' online learning patterns by observing their behaviors' blended learning strategy was used to complete the research. The outcomes were not contrasted with those of other strategies, though.**
Decision Tree	**J48 classifier outperformed several other algorithms, and the suggested strategy outperforms the already used approaches.**
Bayesian Network	**The accuracy of the findings for each dimension of the Kolb's inventory is approximately "71%"; the results can be improved and compared with other classifiers.**
Neural Network	**The authors used a neural network to categories the learners in the various FSLM model dimensions; however, the results have not been compared.**
Bayes Net	**To categories leaners into several classes with various leaming techniques, the authors devised four different methods. The accuracy of these various algorithms was also contrasted. They concluded that "J48" performed more effectively.**
	The procedure was not used, and the outcomes weren't contrasted.
	The authors employed four alternative algorithms to determine the learners' preferred learning style. When the suggested method was compared to existing ones, the accuracy increased.

Method Used	Description
Ncural Network	The authors employed Latent semantic indexing to predict the learner's learning style using the learner's past knowledge, and then they compared it to the information from the learners.
Furry C means	In contrast to earlier researchers, the authors took into account all 16 categories of learning styles, as well as all FSLM model features. The classification results are contrasted with the K-means classification results. It would be fascinating to see how different results from different classifiers differ.

Significance of the Study:

As depicted, the course of precisely recognizing a youngster with a learning handicap is loaded with difficulties and in this way the area of brain science should keep on refining the ID cycle, particularly from a hypothetical and estimation point of view. We might be able to fix some of the aforementioned systemic issues in this way. In this study, I propose that we use the newly formed power of big data, machine learning, and data science to advance our methodological approach to SLD identification. The ability to process huge datasets has significantly improved in just the last ten years. New strategies for arranging, putting together, portraying, and characterizing research subjects have been created by analysts across disciplines. Large technology companies like Google and Facebook have developed many of these more recent strategies with the intention of improving profits by narrowing down market segments. Big data and MLare utilized in the medical sciences to gain a deeper comprehension of intricate biological structures. Large datasets have been used by biologists to decipher and comprehend animal communication. The field of psychology needs to use these effective approaches to diagnose mental disorders.

Background Study of Learning Disability:

The term "learning disabilities" is used to describe various existing issues, including dyslexia, dyspraxia, dysgraphia, and others. A comprehensive overview is provided by Diagnostic and Statistical Manual of Mental Disorders, or DSM-5, published by the American Psychiatric Association. According to a number of studies Kaiser, (2020), learning disorders are thought to be characterized by subtle as well as regionally distributed variations in mind-body systems. The neural bases of learning disabilities are subject of intense study

over past two decades. Root causes of learning difficulties are still unknown, despite significant progress in numerous academic fields (Wang & Yang, 2022). This accumulated susceptibility may also be examined from a number of additional angles, like as

- Other operational definitions of "learning impairments" and how they affect people. On the other hand, some people think that dyslexia can be accurately identified even while its precise form remains unknown. Maybe we could agree with them. We think that this also applies to other learning-related problems.

The DSM-5 categorises these adverse effects as developmental coordination problems even though we are unsure of their origin. In order to summarise:

Motor dysgraphia may also indicate dyspraxia, a developmental coordination disorder (DCD) (Wang & Yang, 2022). It's not a straightforward "Yes" or "No" situation, and the symptoms could be mild or severe. A learning disability affects roughly 10% of population, according to most estimates. It is common knowledge that academic failure can result from any combination of the diseases listed in the DSM-5. It's conceivable that the assessment will be extensive, costly, and sincerely depleting. Furthermore, this procedure may take a long time due to the limited number of licensed pathologists. Due to this situation, many people, particularly those who are most targeted, are unable to complete an examination. This looks for critical evaluations (or pre-assessments) that are quick, effective, and widely available. The majority of the time, our method offers a workable solution to this issue 8. (Zhang, & Tao, 2020).

Characteristics of Children with Learning Difficulties:

Not all students that have difficulty learning are in the same category. They exhibit a variety of traits, such as social and cognitive impairments along with challenges in the classroom (Lu, 2019). Students with learning disabilities can difficulty with a variety of skills, including spelling, reading, writing, computer, gaming, and socialising. For certain kids with learning impairments, there can be a specific problem. Some people struggle with reading even if they can write, think, and interact with others. While some people may have trouble with maths, others may have trouble with spelling or handwriting. Even while some children possess exceptional social skills and social intelligence, they may lag behind their counterparts academically. Their reading,

spelling, and math issues might not be the same as others. Though they behave incorrectly, children with learning disabilities are capable of reading, writing, and all other academic skills. Learning-disabled children often originate from low-income families. They may have suffered bodily or mental harm. In many circumstances, students with learning issues behave in a less socially acceptable manner than their counterparts without learning difficulties. They are less competent, for example, to predict how their activities would turn out. They interpret social cues incorrectly. It is more difficult for them to modify their behavior to fit the traits of the audience they are speaking to (Ahmed, Jeon, & Piccialli, 2022).

Understudies who struggle with learning are generally disregarded by their peers. Teachers and parents are more prone to attach negative attributes to children who struggle with learning. They contend that children with learning difficulties had the worst social skills in task-related behaviors, such as paying attention to instruction, finishing activities, staying on task, obeying instructions, and working autonomously. They have significant deficiencies in relational and self-related behaviors, such as submitting to authority, assisting others, expressing emotions and possessing good self-perceptions. They also exhibit higher anxiety levels, more negative perceptions of their academic abilities, societal standing, and prominence, as well as stronger sensations of instability, responsibility, impulsivity, and adolescence. Pupils that struggle with language acquisition tend to talk in fewer words and stay mute throughout most social encounters. When speaking to their peers, women tend to use more complex vocabulary because they are generally more sensitive to subtle differences in maturity. Every child with a learning issue has distinct qualities that differ from these common traits of learning disorders. For example, reading disabled people have problems with comprehension, short-term memory, and oral reading. These people have trouble reading the order and direction of letters; Orton, a nervous system specialist, called this condition strephosymbolia, or distorted pictures. Attention, perception, lack of drive or attitude, poor sound-symbol connections, memory problems, and language challenges are common challenges faced by children with learning impairments. Children with learning difficulties are prone to becoming confused by words or numbers that look or sound alike. Students with learning disabilities lack self-esteem, motivation, and attributions (Kuleto, et al, 2021).

Reading wears out boys with learning impairments quickly. As they read the material, they moved their fingers to correspond with the words. They read reluctantly, slowly, and carelessly, adding or deleting letters and not using proper punctuation. They read aloud nonstop, word for word. Without closely examining the word, they make an educated prediction based just on its initial letter. Even when it comes to writing, students with learning challenges face difficulties. Assignments involving writing frustrate students with learning difficulties. Pencil grip ineptitude and poor penmanship make writing incredibly sluggish. It's off-space. They need unmatched margins on lined paper for writing. They struggle even when they copy directly from the chalkboard. Students with learning impairments face difficulties with spelling as well. Spelling, like grammar and syntax, is a horrible and challenging chore. There are inconsistent spelling errors. They sometimes mispronounce words, and other times they use the same word but make a different mistake. Usually, they miss the cross of "t" and the dot of "i".

Learning-disabled students frequently have trouble telling left from right and become confused about which hand is their left. A lot of learning-disabled children use their left hand and hesitate to switch hands. Arithmetic is a difficult subject for those with learning impairments. Students with learning problems still calculate with their fingers after eight years. For the disabled, switching numbers and deductions might be a bothersome problem. They are disorganised, careless, and often misplace pencils and books. They also create a commotion as they dine. Parents of children with learning difficulties, especially women, have a tendency to see their children's accomplishment in a manner similar to that of their children, as compared to moms of children without cognitive disabilities. Success is attributed to luck rather than skill by them. Along with social emotional deficiencies, motor skill issues, in particular writing difficulties, are cited as features of the learning handicapped. Children with learning challenges frequently exhibit motor incoordination as a symptom (Malik, Tayal, & Vij, 2019). It might show itself as anything from overall discomfort to problems with motor skills to sloppy handwriting.

Common Elements of Specific Learning Disabilities:

There are a few aspects of learning disabilities that are shared by all of the definitions: 1) neurological factors; 2) cognitive processing factors; 3) difficulties with academic as well as learning tasks; 4) discrepancies between potential

as well as achievement; and 5) exclusion of other causes. The following section provides a brief description of the nature of each of these components as well as the problematic issues that are associated with them.

Neurological Variables: All learning starts inside the cerebrum and, thusly, an issue in learning can be brought about by a brokenness containing the mind and the spinal line. The neurological condition is frequently difficult to identify through internal or external medical testing. Therefore, behavior observation is typically used to determine dysfunction in the central nervous system. Neuroscience and clinical examination report developing proof of the neurological reason for learning handicaps through practical Attractive Reverberation Imaging (FMRI) studies (Coronato, Naeem, De Pietro, & Paragliola, 2020).

Factors in the Cognitive Processing: The term "cognitive processing factors" refers to the uneven development of various mental functioning components. There is no single capacity for mental ability; rather, it is made up of numerous fundamental mental abilities. These individual abilities do not develop uniformly for people with learning disabilities. That is, while some of the components are developing at the anticipated rate or sequence, others are developing more slowly, resulting in symptoms of the learning issue. In a variety of mental processes, students with learning disabilities exhibit strengths and weaknesses.

Trouble in Scholar and Learning Assignments: People with learning handicaps experience various sorts of issues in learning. One kid's test many be in securing of discourse as well as oral language; Another's may be in writing, motor skills, reading, arithmetic, or handwriting. As was mentioned earlier, learning disabilities can be identified in seven distinct academic domains in the operational portion of the federal definition.

Discrepancy between a Student's Academic Success and Learning Potential: The definition of a gap between what a student might be capable of learning and what they actually learn or accomplish is the part of the definition of learning disabilities that causes the most debate. According to operational part of federal definition, a child with learning disabilities has a significant gap between their intellectual ability and achievement in at least one of seven areas. This assessment cycle involves various issues, for example, the utilization of intelligence level tests to decide an understudy's true capacity for

learning and the level of serious disparity expected to discover a learning handicap. In order to determine whether a child is qualified for services for learning disabilities, some states use one of several "discrepancy formulas" to qualify the learning disability discrepancy.

The omission of any other causes: It is presumed that Specific Learning Disabilities are not predominantly caused by mental retardation or another condition; emotional turmoil; visual or hearing impedances; or social, economic, or cultural contexts. However, because children frequently exhibit co-occurring (or co-morbid) issues, exclusion component of explanation of Specific Learning Disabilities becomes difficult to implement in practice. Teachers who work with students who have additional disabilities frequently notice that many students appear to have both their primary disability and their learning disabilities. It is becoming more and more accepted that other conditions frequently coexist with learning disabilities (Nosratabadi, Mosavi, Keivani, Ardabili, & Aram, 2020).

Machine Learning in Learning Disabilities:

Machine learning (ML) is a class of calculations that enables software applications to become increasingly accurate in anticipating results without being explicitly changed. Machine learning relies on algorithms that can take in data, use statistical analysis to predict a result, and update output as new data becomes available. Predictive displaying and data mining share many of the same processes as machine learning. Both involve modifying program activities in a similar manner and searching through data for instances. This is because suggestion motors use machine learning to tailor online (Abdi, Sedrakyan, Veldkamp, van Hillegersberg, & van den Berg, 2023). promotion transmission virtually continuously. Personalised advertising, fraud detection, spam filtering, network security, thread identification, predictive maintenance, and the generation of news sources are some further common uses for machine learning. Machine learning is the process of simply instructing a computer to perform an action without explicitly programming it. In the modern world, the brain of every successful system is a machine learning algorithm. Consider sites like Facebook, LinkedIn, Amazon, the Google Search Engine, and so forth. In essence, machine learning makes a computer perform a task without having been explicitly programmed to do so (Atlam, Ewis, Abd El-Raouf, Ghoneim, & Gad, 2022). They are successfully utilizing data gathered

from various channels and encouraging them to display an actual image. AI calculations are consistently delegated managed or solo. In order to supply input and the desired output for supervised algorithms, a data researcher or analyst with machine learning abilities is also required to provide feedback on the prediction during algorithm training. Data researchers choose the factors or highlights that the model should look at and utilise to generate expectations.

Algorithm will apply the findings to new data once preparation is finished. In contrast to supervised learning systems, unsupervised learning algorithms—also known as fuzzy logic—are used for more complex processing tasks like image recognition, speech-to-text and natural language generation, and predicting medical issues, among others. Figure 1 depicts the LD analysis machine learning architecture.

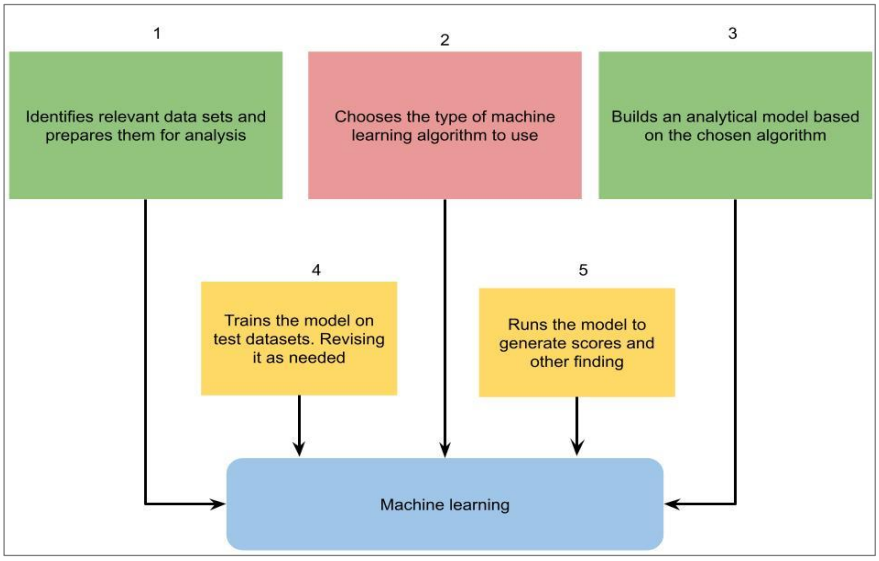

Figure-1 machine learning architecture for LD analysis

AI is utilized in wide assortment of fields and applications where certain results must be anticipated. Building algorithms that can predict an output using statistical analysis and update outputs as new data becomes available is fundamental premise of ML. Predictive modelling and data mining have processes in common with machine learning. Both necessitate analysing the data for patterns and adjusting program actions in accordance with those patterns (Ahire, Awale, & Wagh, 2022).

Existing technique based on learning disabilities using machine learning:

The available literature reveals that numerous international studies have focused on learning disabilities. Various Examinations have been directed on various parts of learning incapacities like pervasiveness of learning inabilities, attributes of learning handicaps, and explicit investigations on perusing, composing, spelling and number-crunching troubles. In addition, a good number of studies have focused on biological, social, cultural, economic, and environmental aspects of learning disabilities.

As a descriptive study, Work AlShaikh, & Hewahi, (2021), evaluated a variety of machine learning interventions in various teaching and learning systems and made recommendations based on the results. Calculations based on machine learning have a great deal of potential for enhancing systems and promoting the education of people with special needs by offering flexibility and adoptive learning experiences. This concept has also been expanded to include recommendations for those who are disabled, essentially with deemed design alternatives. The potential for these technologies to support the learning of people with impairments has also been investigated and clearly supported. A machine learning-based diagnosis and classification system was presented by author (Sharif, & Elmedany,2022). Specialists, trained users, and parents can use the system's diagnostic module as a pre-screening tool to identify dyslexia's negative effects. Classification is the second module, and it divides the children into two groups: non-dyslexics and dyslexics with questions. A data analysis tool is included in the third module. Work Cui, et al (2023), This examination centers around outer appearance recognizable proof utilizing convolutional brain organizations and its utilization in e-learning frameworks by presenting another methodology that incorporates three fundamental stages: classification, feature extraction, and preprocessing. Work Ahuja, Thapliyal, Nayyar, & Kumar, (2022) created a semantically enhanced module-based e-learning system for computer science programs from a learner-centric perspective. By classifying students according to their level of proficiency, users are provided with a personalised learning environment. Despite everything, extensive research is required for e-learning-based learning issues. This paper also developed a personalized evaluation theoretical model for dyslexic children's alphabet learning with learning objects.

The author Hamim, Belabor, & Sael, (2021) shared the results of a prototype mobile application that helps dyslexic people deal with their reading difficulties in real life and get the right treatment. This model can perceive the texts in their current circumstance and read them noisily so the client can figure out them. Depending on their skill levels, they will also be able to modify the word chunking, looking over, and featuring. The client will actually want to understand troublesome and complex words all the more promptly by joining word reference support with phonic as well as morphological design of word. What's more, review investigated the utilization of an AI way to deal with work on viability of learning dyslexic complex words. Work Qian, (2022) focused on adaptively sensing students' behavior from an engagement standpoint to help dyslexic students deal with their difficulties. Consequently, we use Bag of Features (BOF) image categorization as part of a machine learning strategy to predict student engagement with learning content. Forecast for engagement was based on the 30 students' frontal faces. In this BOF model, the writers utilized the Speeded-Up Powerful Element (SURF) central issue descriptor and grouped the codebook utilizing the k-Means approach. The best classification result was then obtained by employing three distinct classifiers by the developers: Nave Bayes, the Support Vector Machine (SVM), and K-Nearest Neighbor (k-NN) Creator Bhaskaran, & Marappan, (2021), meant to change this by distinguishing dyslexia early utilizing AI models that foresee dyslexia by examining how individuals draw in with an etymological PC game game's pieces were made utilizing (I) an observational etymological examination of mistakes that people with dyslexia make, and (ii) explicit dyslexia-related mental capabilities as a top priority: Working memory, executive functions, and perceptual processes are all involved. Work Yang, Chiang, Cheng, & Ji, (2021), fostered a feeling acknowledgment strategy in light of external appearance with change recognition. Emotion detection classifiers were developed by conducting an emotion elicitation experiment to collect facial landmark signals. To fabricate classifiers to recognize feelings, the recommended strategy utilized the sliding window procedure and the help vector machine (SVM). The Chi-square and Information Gain (IG) feature assessments were used to find useful features for identifying emotions. Furthermore, the performance of classifiers using a range of sliding window parameters was investigated. The systematic literature review, which

was carried out by Work Salau, Hamada, Prasad, Hassan, Mahendran, & Watanobe, (2022), included a thorough search of scientific literature databases, research selection based on exclusion and consideration criteria, literature analysis and synthesis, and literature analysis. Writer El Fazazi, Elgarej, Qbadou, & Mansouri, (2021), the research network has used a range of machine learning techniques, image processing techniques, design assessment, and dyslexia-supportive assistive technology to try to separate dyslexic people from non-dyslexic people. Several aspects of dyslexia research are the subject of this survey study. Work Aslam, Jilani, Sultana, & Almutairi, (2021) give a technique to recognizing kids' learning styles that depends on their connection with the framework. This study uses an artificial neural network to predict learning style of children with LDs. Device serves as a personal trainer for dyslexic children, and the author Latif, XianWen, & Wang, (2021), coded it. Because the system might present many images for the same sentence, the kids can learn more interactively and retain the words. The accuracy of this system, which will be taught for Hindi speech recognition and phonetics of each alphabet and word, has been increased by the use of machine learning techniques.

Work Latif, Driss, Boulila, Jamal, Idrees, & Ahmad, (2021), use statistical methods to use eye movement to differentiate dyslexics from non-dyslexics. Eye movement can exhibit obsessions, saccades, transients, mutilations, and other characteristics. Utilizing Head Part Examination, upgraded level attributes are gotten from the crude eye tracker information. This work recommended a Half and half Piece SVM-PSO in light of Molecule Multitude Streamlining (PSO) for the expectation of dyslexia in individuals. In order to get a better understanding of the work done on learning disabilities and machine learning, author Bhardwaj, Gupta, Panwar, Siddiqui, Morales-Menendez, & Bhaik, (2021), reviewed the papers. An illness that cannot be treated is a learning disability. In any case, these kids can benefit from outside assistance in determining their potential and choosing a suitable career path in the future with the right diagnosis and support. Work Zhou, Lu, & Pei, (2021) Students with disabilities will benefit from personalized learning. There are four sections to the system: I) Predicting the user's level of education. ii) Creating multimodal learning resources through the use of web mining. iii) The outcome is connected to the client's inclinations. (iv) Content tailored to the

user, separated by an intelligent interface. Creator Zong, Lipowski, Liu, Qiao, & Bo, (2022), supported involving front facing face location as an elective way for anticipating understudy consideration. The authors employed a machine learning strategy that made use of the Speed-Up Robust Features (SURF) descriptor to identify the primary goal of the images and group them according to their codebook sizes.

The various features that should be taken into consideration when designing and evaluating e-learning systems are outlined in Table 1, which details the feature predictions made by various machine learning (ML) techniques. These attributes consist of user feedback, course recommendations to students, prompt system responses to students, student performance, knowledge, emotions, online session assessments, student ranking credits, learning objects and learning styles, learner Behavior, learner sequence, learner pattern, student graduation results, course data, learning processing data, and learning assessment pertinent to the classes of learning analysis.

Table-1 Comparison of LD using machine-learning technique

E-Learning Feature	ML models and Technique	Prediction Accuracy rate	Criteria evaluated using ML
User opinion [20]	HMM, SVM, MI, IG, CHI	F-Measure 0.803	Accuracy rate of user opinion predicted
Course recommendation students [21]	Simple K-means Algorithm, ADTree classification algorithm, and Apriori Association Rule algorithm	The best course cluster is provided by the Apriori Association.	Courses are mapped out.
Timely system response the students [29]	methods using genetic algorithms and machine learning	-	Automated Web Bos responds quickly
Students performance, knowledge [23]	SVM	F-Measure-0.986	Predicts how quickly students will learn.
Students' emotions [25]	$k-NN, SVM$	SVM accuracy ratio-97.15%	Accurately predicts students emotions
Online session assessme [27]	group of classifiers Integrated bagging with ML	78.04% accuracy	Predicts beneficial sessions
Student Ranking Credits [51]	ECOC combined Classifier	F Statistic is 3.05	Prediction

E-Learning Feature	ML models and Technique	Prediction Accuracy rate	Criteria evaluated using ML
Learning styles and learning objects[26]	Bayesian Estimation	Bayesian infer the increase in visual category	evaluates Learning style
Learner Behavior sequer [84]	Fuzzy Cluster technique	78% matches with real word data	Predicts learner behavior
Learner sequence Learning pattern [82]	FCM, K-Means clustering	96.89% accuracy is shown by FCM, and 81.12% by K-Means.	Classified Learners sequence
Student graduation resul [53]	Perceptron ANN	Predicts successful 77% Unsuccessful 68%	Predicts graduation successful ness
AUI features [60] course	Felder Silverman method	Classifies leaming models	Learning predicted models
Course information [59]	ANN, LMA method	R value 9.08	estimates future GPA
Learning processing data [39]	Conv-GRU-AvgP in P-xNN	Accuracy 80.4%	Predicted Learning performance
Students assessment [61]	DL Tensorflow Engine	80% – 91% of accuracy	Predicts students future pathway
Student Test Results[114]	Random Forest	26.7% error rate	Predicts performance
Student engagement in courses[115]	K Means clustering	Silhouette coefficien for Two level cluste is 0.7003	Classify student groups

Rasheed, & Wahid, (2021), conducted research on learning styles and their malleability, including a discussion of how culture influences learning styles. An experiment with children ranging in age from 6 to 7 years demonstrated by Angeli and colleagues that cognitive styles can also change. Different learning style models have served as the foundation for various research methods. This section provides a summary of some of the methods used by various researchers to identify learning styles and the amount of time spent using learning style models. The findings of researchers demonstrate a connection between academic performance and learning style. Numerous artificial intelligence methods have been proposed by researchers to automatically identify learners' learning styles. Ivanova, Terzieva, Ivanova, & Todorova, K (2022), establishes two distinct approaches. Work Xu, (2021), a data-driven and literature-based method for automatically identifying learning styles. The

goal of data-driven strategies is to create classifiers from the data. In order to identify the learning style, literature-based approaches make use of the user model to derive simple if-then rules from it. The proof of specialists utilizing writing based strategies can be found in (Narvekar, Peng, Leonetti, Sinapov, Taylor & Stone, 2020). Using the extracted data, each of these methods constructed classifiers and extracted some attributes from user behavior. The researchers who developed Bayesian networks for identifying learning styles are Author (Kham aria, & Pandey, 2020). A choice tree was utilized by the accompanying scientists work (Jan, & Khan, 2023). The brain network is an AI method that depends on the idea of neurons and the learning capacity of the human mind.

Research Contribution

Children's learning disabilities can be predicted using a variety of machine learning algorithms. It is best to handle situations where the forecast is incorrect. It is possible to use comparisons of existing machine learning algorithms to determine which ones produce the most accurate predictions for a particular set of data. When preparing data for forecasting, step-by-step analysis is critical. A few new techniques that can be legitimized will assist with giving better speculating results. This can assist the learning handicap treatment with promoting that characterizing an organized market picture and giving a definite portrayal of the different elements that are supposed to additional market improvement. Moreover, a far-reaching investigation and exhaustive investigation of the present status of the clinical treatment industry with learning inabilities is portrayed. In addition to competitive evaluations in light of shifting market conditions, this report will provide comprehensive information on both potential and existing markets.

Conclusion

An important part of professional education in artificial intelligence is taking courses in machine learning. This study is centred on professional machine learning courses in artificial intelligence. It also looks at the condition and problems of professional AI education in light of the demand for artificial intelligence expertise in the new era. All of these issues are addressed, including dreary classes, a single teaching method, inadequate professional practice, and rigid evaluation procedures. This exploration presents another keen innovation based instructor assessment framework. Language-based classification

is necessary because the signs and symptoms of learning difficulties vary depending on the language used. A few delicate figure moves toward now being used have lower accuracy levels that can be moved along. When using image databases of cerebrum for dyslexia prediction, not all parts of brain are frequently examined. They just saw one piece of cerebrum to anticipate dyslexia, which is incapable in light of the fact that dyslexia can foster in numerous pieces of the mind. There are a number of assistive devices that can help dyslexics improve their reading and writing skills. Dyslexia is likewise a troublesome condition to foresee early and precisely. The usage of AI draws near, picture handling, and assistive gear for the expectation/help of dyslexia has been depicted in this paper. Majority of ML calculations used to predict dyslexia focus on a small number of dyslexia symptoms or traits. Since the attributes of dyslexia could change relying upon the language, language-based grouping is fundamental for better expectation. This paper extends the following recommendations for future studies:

i. Future research could benefit from combining AI models with insights from neuroscience, psychology, and education to create comprehensive tools for diagnosing and managing learning disabilities.
ii. Conduct long-term studies to assess the impact of AI-driven interventions on students with learning disabilities.
iii. Investigate how AI tools can be integrated into teacher training programs to help educators better understand and address learning disabilities.

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