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ANALYSIS CHILD LEARNING DISABILITY USING AUGMENTED REALITY

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Abstract:

The usage of technology has recently been advocated to improve the teaching and learning experience in the classroom. An increasing reality is one of these technologies (AR). An increasing number of user-based studies have examined the enhanced reality (AR) interfaces extensively over the past few decades. In this research, we examine the influence of the pre-school learner on AR systematically. This review will primarily contribute to presenting the full scope of user-based AR research and finding the answer to early childhood learning disabilities via AR. Hyperactivity disorder is an important part of children diagnosed with attention-deficit. Children with hyperactivity disorder encounter a variety of problems connected to 3 main symptoms. The AR-Kid application was used by children aged 4-6 years to analyze application tests on attractivity to determine the LD in the child. Their main symptoms may adversely affect children's academic and social performance throughout their whole school lives. We also identify regions in which few user surveys and future research possibilities have been conducted. In particular, we discover that an increasing tendency towards portable AR user research is taking place and that most research is carried out in labs. This research is helpful to AR researchers who want to follow best practices in the real-life development of their AR user studies.

Keyword: Augmented Reality, Learning Disorder, Diagnosis.

I. Introduction:

The stage before an operation, when children aged between 2 to 7 years undergoes numerous phases of major cognitive processes such as creative thinking, faith, self-centeredness, logical thinking, memoirs, spatial thinking, conservation, etc.[4]. The first step in providing learning and the function of childhood education is education in pre-school children so that any effort to shape and generate quality of human resources will form the basic notion as the basis of the thought power of children towards the next level of education. Based on observations and interviews carried out in different kindergartens which we refer to as pre-school children, learning about materials for recognition of animals and fruits, the findings in the field are usual in books that display simply text or images. Sometimes the instructor immediately introduces animals and fruits, because the fruit the instructor provides is the original fruit. However, this is incredibly inefficient, because it involves cost, energy, and additional time.

Researchers believe that there is no way to deny the linkage between study and play. In particular the integration in the learning environment of modern technology[6]. The benefits are enhanced learning performance and education for children[4], as well as seamless connections between actual things and virtual material [5]. The mix of conventional physical activities and virtual computer games provides youngsters considerable benefits[4]. This has led to the connection and adaptation of the notion of play and learning to the times and new technology.

Several learning issues are covered by learning handicaps or learning disorders. Learning impairment is neither intellect nor a motivation problem. Children with difficulties in learning are neither lazy nor stupid. Most areas are intelligent as everybody else. They're connected differently to their brains. This variation influences how information is received and processed. Simply children and people with learning impaired vision, listening, and different understanding. This might lead to difficulties in acquiring and using new knowledge and abilities. Literacy, writing, mathematics, reasonings, listening, and speaking is the most prevalent forms of learning disorders.

Identifying learning difficulties is not often straightforward. There are no isolated symptoms or profiles that may be considered as evidence of a problem because of the large changes. But at different ages, certain warning signs are more prevalent than others. You may get a learning problem early and take rapid actions to help your child

recover from learning disorder when you are aware of what they are.

1.1 Learning Disability

A learning impairment involves the way a person is receiving information and processing it. Learning disabled people might experience difficulties with everything. Disabilities in learning have nothing to do with how intelligent a person is. Instead, an individual with a learning impairment might see, hear or comprehend things differently. This can make daily chores much more challenging, such as studying for a test or remaining focused in class. A person can learn to deal with these variances using techniques.

The standard diagnosis of learning difficulties involves two tests and the observation of a substantial disparity between their scores. These tests are a standardized exam (reading, writing, arithmetic) and an intelligent exam (IQ) in intelligence testing. Although most children with learning impairments are normal or above-average, they do not display this potential incomplete performance testing. For example, a young woman may have a full-scale IQ test of 112 but her math scores may not be as large as 90, which might qualify her for special assistance at her school for a difference of 22 points between the potential (IQ) and the actual (math) performance. For example, some countries define a learning impairment as a 15-point difference although service standards vary among countries. Consequently, occasionally state-mandated criteria remove a spectrum of learning challenges that do not create large disparities.

1.2 Types of Learning Disabilities

Many types of learning difficulties exist and persons may be affected differently. It is vital to remember that ADHD and autism spectrum disorders are less the same as apprenticeship disorders.

The primary forms of disturbance include:

Dyspraxic: Dyspraxia Dyspraxia impacts the motor abilities of a person. Motion and coordination aid us with motor skills. A young kid with dyspraxia may become involved or find it difficult to hold a spoon or to tie his or her shoelaces. He might later struggle to write and write things. Additional dyspraxic disorders include:

- Sensitivity to light, touch, taste, or smell
- Difficulty with eye movements

Dyslexia: The way a person handles language impacts dyslexia and it can make it difficult to read and write. Grammar and reading comprehension may also be problematic. Children may also have difficulties orally expressing themselves and gathering ideas during the discussion.

Dysgraphia: Dysgraphy impairs the ability of a person to write. Dysgraphic patients may have several difficulties, including The capacity of a person to do mathematics is affected by dyscalculia. Mathematical disorders may take several shapes and symptoms in different ways. Dyscalculia may impede the study of counting and identifying numbers in young children. As a youngster gets older, it might be difficult to solve fundamental math problems or to memorize things like multiplication tables.

- Trouble with spelling
- Difficulty putting thoughts down on paper

Auditory treatment disorder: this is an issue with how the brain processes a person's noises. It is not due to impaired hearing. People may have problems with this disorder.

Visual Processing Disorder. Somebody with a visual preparing problem experiences difficulty deciphering visual data. The person in question may struggle with perusing or differentiating between two items that seem to be comparable. Individuals with a visual handling issue frequently experience difficulty with dexterity.

The Application of Augmented Reality (AR) technology is according to [7] the answer that affects the present learning difficulty. The statement of [8] AR takes into consideration three features, namely the actual world and the virtual world together, which may offer interaction and exhibit 3D things. AR may benefit, promote human activity [9], offer rich channels of communication and interaction power [10]. The presence in the actual world of 3D things gives a wonderful sensation in particular [11]. In AR applications in the educational sphere, multimedia combinations may be employed primarily to boost pre-school children's learning. This feature of AR helps the learning process extremely well [12].

II. Related work:

This section intends to introduce research papers in education on the usage of AR technology. AR represents the construction of virtual environments called virtual reality; its characteristic consists in the development of virtual objects, which may be overlaid on actual items in real-time (Zhou et al. 2008). AR offers numerous educational solutions to teaching and learning processes in educational contexts (Billinghurst and Duenser 2012; Radu 2014). The student has an enhanced learning experience when a multimedia manipulation combines different media content such as animations, tracks of sound and images, videos, and a new form of multimedia learning; in fact, it offers a useful exploration experience of educational content by combining real and virtual information.

AR solutions can reinforce academic results in comparison with traditional techniques (Ozdemir et al. 2018). In addition to demonstrated academic benefits, research has highlighted several advantages associated with the use of RA systems in education systems that may, at least in part, reflect a better academic outcome, the most important of which being increasing the motivation of learners, sensory commitment, memory retention and learning satisfaction (Garzón et al. 2019; Saltan and Arslan 2017). About language learning, the literature has demonstrated the

efficiency of incorporating AR into learning activities to improve the reading and writing abilities of students (Billinghurst et al. 2001; Vate-U-Lan 2012). In particular, AR educational solutions were proven to improve the memory and orthography of learners (Khoshnevisan 2018). An up-to-date AR system for children's reading and orthography skills has been established, such as phonological awareness and alphabets (Fan et al. 2018). The technology offers a mix of increased dynamic color signals and tangible letters that supports the learning of youngsters by encouraging their attention and delivering interactive feedback on their activities.

In a more recent study (Avila-Pesantez et al. 2018) a selective and focused attention development for ADHR-diagnosed children has been revealed. The first results of this study show the efficacy of AR solutions to increase the focus of youngsters and to alleviate their aggravation when resolving issues. Similarly, another study (Vahabzadeh et al. 2018) found first indications of the affectability in school-aged children diagnosed with autism spectrum disorder using AR solutions in lowering the symptoms of ADHD, such as hyperactivity, inattention, and impulsivity. Especially in social and behavioral therapy modules, children were invited to wear AR-smart glasses [33] and exhibited a reduction in symptoms connected to ADHD. In summary, our findings imply that AR solutions can be useful in providing customized interpretive and orthographic solutions for children with ADHD provided such solutions are also able to address results through their impact on inattention.

Marto, et al. have systematically reviewed research focused on the use of AR in the rehabilitation of persons with ASD diagnosis. They discovered 16 main research papers in which research questions (RQs) relating to targeted abilities, participants, the technology employed, and the findings were answered. Khowaja, et al. did a systemic review of empirical research literature (SLR) which employed AR to assist people with ASD in the development of social communication skills. A total of 14 main studies found answers to RQs about targeted abilities, participants, technologies employed, study design, method of data collecting, identification, and finding.

In a variety of approaches and methods, several studies have improved the learning of pre-school children. Previous 2016-2018 study, namely: suggested usage of Education Magic Toys (EMT) based on AR[13], was presented. teacher development [13]. teacher development. A significant approach to animal recognition should be used in AR [15]. AR for the basic letters of alphabets [16]. To develop the Hijaiyah alphabet AR application[17]. English language AR and structure [18]. AR Autistic children's multimedia[19]. Indonesian Typical Animal Recognition AR Request [20]. Animal animation material for interactive learning [21]. Bekantan Educational Children's Game (BEG) [22]. The Computer Assisted Instruction (CAI) methodology [23] introduces multimedia-based animals. Current research suggests the use of learning media in alphabetical order for preschool children between four-6 years old, using AR technology to raise 3D objects, item names and pronunciation sounds in animal and fruit recognition material [33]. Then analyze, assess and determine the effect. The results contributed to a larger investigation in this research report (encompassing the whole spectrum). Following table gives the details overview of Learning disability,

Table 01: Traditional Techniques use for Finding learning Disability

Disability	Adaptations	Description
Reading	Tape-recorded material Semantic mapping software Electronic word recognition and definition Closed-circuit television Speech synthesizer/screen reader software Optical character recognition (OCR)/scanner	Audio recordings of textbook content and responses to questions about chapters or workbooks. Software (e.g., InspirationTM) that allows readers to understand narrative story writing elements orexpository through graphic representation. Presenting word meanings, (e.g., Franklin Talking Language MasterTM)Magnifies reading content; minimal reading displayed at onceComputerized voice "read" information on computer display (e.g., DecTalkTM).Text is scanned into screen and OCR system computerizes text so that it can be "read" through speech recognition (e.g., JAWSTM) informing time orally Similar tracking time tools.
Written expression	Pencil grip Alternative-hardware input devices Semantic mapping software Tape recorder Word prediction software Speech recognition Electronic spelling devices Word processing spellcheck option Speech synthesizer/talking Software	Piece of plastic attached where "Stickie buttons," touch screens, trackballs, custom keyboards are grasped with the pencil. Technology for planning and organizing writing Standard tape recorder for dictation of written goods (e.g., InspirationTM). Software which assists with the structure and syntax of sentences (e.g., Co: WriterTM). Speech recognition allowing for written text dictation (e.g. Dragon DictateTM, Kurzweil VoiceTM). Devices that speak and show, or only show, terms and meanings (for example, Franklin Speaking Language MasterTM, Franklin Spelling MasterTM) Standard spell check optionSpeech synthesis with word processing software (for example, Write. OutloudTM).
Mathematics	Graph paper Calculators Talking clocks Timing devices	Centimeter squares are used to fit numbers. Answer testing devices; talk calculators (Radio Shack TalkingCalculatorTM Model EC-208); large keyed calculators Clocks specially made.

III. Problem Definition:

If a learning disability is not early discovered or accurately identified and treated, a variety of other challenges might arise. These additional obstacles might be emotional, and a youngster might feel upset, frustrated, or deceived. Conduct issues may emerge, such as acting out. Or, issues with learning in the family may occur, leading for example to mismanagement, tension, or blame for others. Studies suggest that 30-50 percent of them suffer from learning difficulties among youngsters whose families seek professional aid for emotional or behavioral difficulties.

Learning difficulties can be difficult to identify since each kid is not given a definite list of symptoms. A lot of kids are also trying to disguise the problem. Nothing may be more apparent than repeated complaints about schoolwork or a youngster who does not want to go to school.

Nonetheless, coming up next are indications of a learning issue:

- Working at a lethargic speed
- Trouble following headings
- Trouble keeping fixed on an errand
- Difficulty understanding dynamic thoughts
- Lack of tender loving care, or an excess of meticulousness Poor social skills

- Lack of automated system.
- Disruptiveness

So if you know what they are, you may fast and early detect a learning issue to assist your child to foresee the learning impairment by employing increased realism.

IV. Proposed work:

The proposed work will be using an augmented reality approach, for predicting the learning disabilities in the children by collecting the proper dataset and verifying the collected dataset according to criteria. The informational index can be gathered from different sources like a document, data set, sensor, and numerous other such sources however the gathered information can't be utilized straightforwardly for playing out the examination cycle as there may be a ton of missing information, very enormous qualities, chaotic content information or uproarious information. Subsequently, to tackle these issues Data Preparation is required. Information pre-handling is the main advance that helps in building AI models all the more precisely. Hence, certain means are executed to change over the information into a little spotless informational index, this piece of the cycle is called information pre-handling. After all pre-processing steps, the predication process gets started by properly selecting the training & testing method before applying it to collected datasets. As the wrong predictions obtained from different predication algorithms for all inconsistent data sets can be lead to limited accuracy & less performance so proper dataset selection is very important.

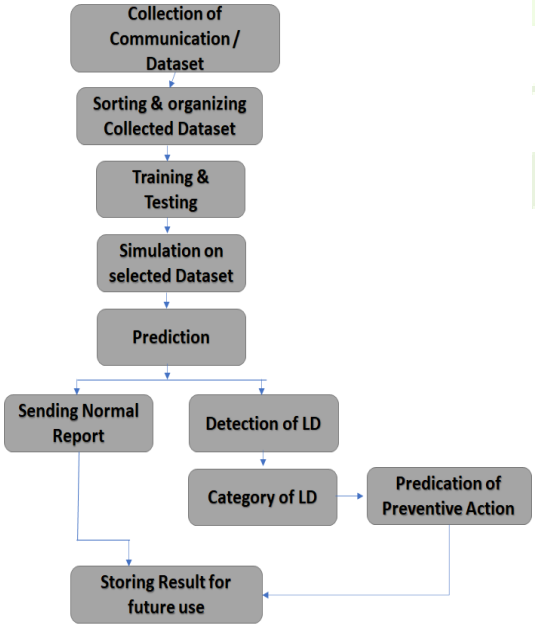

Figure 01: Proposed Framework

For model training, the model is firstly divided between "Training data," "Validation data" and "testing data" into three portions. Train the classifier using 'training data set' and then tester the classifier performance with the invisible 'test data set.' Then tweak the parameters with "validation set." Only the training and/or validation set is available during training.

A collection of information is used to learn to match the classifier parameters. The main purpose of cross-validation is to measure the ability of a model of machine learning on invisible data. The training data used to adjust the parameters of the classifier are a set of invisible data. A collection of unseen data is used just to evaluate a fully defined classifier performance. The data set was trained using supervised learning algorithms. The ultimate aim is for the model to generalize correctly findings on unseen data, in other words, depending on the internal parameters that it has been trained and verified. The next level is prediction, machine education uses data to answer questions. queries. So, the step we get to answer certain queries is predictions and inferences. This is the crux of all this labor, where ML realizes the worth of the increased reality.

V. Conclusion:

This orderly writing audit started by choosing the time of distributions from various diaries to distinguish the significant examinations. Across the essential examinations, the creators have utilized a few AR advances. The fundamental reason for the current paper was to introduce starter discoveries on the viability of coordinating AR content into a viable online education modified in supporting the obtaining of proficiency abilities in an example of youngsters analyzed. As the impact of utilizing AR among the members was positive. Nonetheless, for the specialist's keen on leading further examination and exploring AR, a few significant focuses do arise.

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