

A Study the Cloud Computing Based E-Learning Framework for Learning Disabilities

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Abstract - Cloud computing is the prospect of computing. Experts and government officials have taken notice of the latest computing technology. The cloud's promised qualities will be essential in bringing e-Learning resources to as many people as possible. We must first analyze the limitations of currently available e-Learning services in order to understand how cloud computing may enable e-learning on a massive scale. Utilizing cloud computing based e-Learning solutions in India can help to address many of the obstacles that have hindered the development of e-Learning in the country thus far. The primary goal is to increase the availability of specialized online education resources for students with disabilities. The rationale is that the complexity of e-learning systems necessitates a new approach to rolling out e-learning services at educational institutions.

Keywords - Cloud Computing, E-Learning, Learning Disabilities, Students

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INTRODUCTION

The constitutional guarantee of equal opportunity necessitates that special education be available to meet the needs of all people. But there are some individuals who, have physical & mental abilities, require instruction that is more suitable (or) appropriate than is typically offered in formal & informal educational settings. These individuals are referred to as "exceptional" or "special," & educational focus area has been established to meet their unique educational needs (Laura and Ashman, 1985).

The success of the educational system depends on its ability to accommodate students from a wide range of backgrounds. Disabilities such as learning challenges should be considered while planning an inclusive classroom. In American English, "learning difficulties" is more prevalent than "learning disabilities." As a consequence of exposure to American literature, the term "learning disability" is more commonly used in India to describe learning difficulties.

An important role is played by teachers in every educational system. An artist who molds & shapes the physical, intellectual, and moral powers of the student is in charge of the lesson. In a typical public school, you'll find a large population of pupils who struggle in some way because of a physical or mental impairment. Children who have significant difficulties are often enrolled in specialized educational programs. However, students with moderate to severe disabilities typically attend traditional public schools.

HISTORY OF LEARNING DISABILITIES

The study of learning difficulties is a newer branch of psychology. Here is a quick rundown of everything that went down. Three distinct periods of development can be traced back to the inception of the study of learning difficulties. In order, the three stages are as follows:

- The Foundation Phase-(Early Brain Research) 1800-1930.
- The Transition Phase-(Clinical Study of the Child) 1930-1960.
- The Recognition Phase-(Implementation in the Schools) 1960-1980.

The Foundation Phase

The foundation phase ranges right from 1802 to 1946. Three different sorts of illnesses were studied in the preliminary study phase. The three types of disorders are

- a) Disorders of spoken language.
- b) Disorders of written languages.
- c) Disorders of perceptual and motor processes.

A clear knowledge of the studies related to each of the aforesaid disorders is very essential for better perception of the concept.

The Traditional Phase

The traditional phase witnessed expanded interest in this area. The contribution of Head (1926), Myklebust (1954-67), Kirk (1961), Lehtinen (1947), Kephart (1955), Cruickshank (1961), Getman (1962) and Frostig (1964) was in deed immense.

The focus has extended to include students with "normal" intelligence who nonetheless struggle to understand concepts through traditional instruction methods. This curiosity paved the way for specialized education for those with neurological impairments, such as dyslexia, aphasia, & brain injuries.

The Recognition Phase

The aforementioned diverse roots learning disabilities became an integrated field under an umbrella-like definition in the mid 1960's. Our elaborate discussions of the first two phases also focus on the relationship of various persons, types of disorder, and other social and environmental influences on the developments of this interesting, complex field of learning disabilities. Thus learning disabilities as an integrated field came to be named in 1963, even though the historic roots of the field go back at least to the early 1800s. In 1963, Samuel Kirk suggested the term "learning disabilities". He did not mean to suggest it as another label, but the term was embraced by parents as a potential point of focus for advocacy efforts on behalf of their students, many of whom had been denied free and effective public education. Since 1963, As a result of this rapid (though disorganized) expansion, learning disabilities is now the largest of the officially recognized sub-fields within special education.

Contributing aspects to the growth of the study of learning disorders. There is a clear historical progression in how the field of learning impairments has evolved due to the effect of three separate elements. The scientific community's fascination with out-of-the-ordinary conduct, the popularity of certain pedagogical approaches, the desire of parents, legislators, & educators to offer certain services, and so on all fall into this category.

CONCEPT AND DEFINITION OF LEARNING DIFFICULTIES

Concept of Learning Disability

Special education's newest and most difficult subfield is learning disabilities. The word was coined by Samuel Kirk as a middle ground at a parents' meeting in New York City in the early 1960s, when a number of different labels were employed to describe a child with average intelligence who had difficulties in school. As a consequence of an abnormality in the pathological process of considerate or utilizing language, a being with a learning disability has an impaired facility to listening, imagine, speaking; reading, writing, or perform mathematics calculations; or perform any of these other tasks with difficulty.

It wasn't until 1963 that the term "learning disabilities" was coined, but the field's roots could traced back to the 1800s. There has been documented interest in brain dysfunction and the connection between such dysfunction and observed disorders of spoken language since Gall's work in 1802. A growing concern about what a person can learn and how to teach him with parts of his overall mental ability that are still intact or functional was evident at the dawn of the 20th century.

Learning Disabilities: A New Definition

The phrase "learning difficulties" is used to describe a wide variety of conditions that make it difficult for a person to learn new material, whether it be verbal or nonverbal. One or more learning-related psychological processes must be disrupted in addition to typically functioning thinking and reasoning for these conditions to manifest. Disabilities in the areas of reading comprehension and vocabulary are distinct from intellectual disabilities because they are both specific & distinct.

Learning Differences / Learning Difficulties

Using the term learning difference, Levine (2002) described a extensive range of students who were having difficulty in school because of their differing levels of ability to learn. There is no such thing as a learning difference or complexity, opposed to famous notion. The concept of learning differences is universally applicable to all students. Those students with learning disabilities, on the other hand, are those with underlying neurological conditions. In the special education law, students with learning disabilities are classified as a special education population whose rights should be safeguarded. It's illegal to use terms such as "learning differences" or "learning difficulties" (Silver 2001).

Learning Difficulties in Indian Context

Poverty, illiteracy, & unemployment are all too common in a populace as large as India's. It is difficult enough to educate a normal student in such a large and impoverished population; imagine how much more difficult it is to educate a special needs student. Even though they may appear and act like their peers, many students lack the academic ability to compete with their peers. They have a condition known as learning disability, which is a cluster of disorder in listening, speaking, reading, writing, & math. These students are constantly embarrassed in front of their peers. Increasingly, schools and educational institutions across India are aware that 15 percent of students have some degree of learning difficulties. Any individual, regardless of intelligence, can suffer from learning difficulties that affect their ability to learn and their behavior.

TYPES OF LEARNING DIFFICULTIES

A few of the most frequent forms of learning disability are:

(1) Oral Language Disabilities

- **Dysphasia:** The inability to understand what is being said (Receptive dysphasia) or express oneself verbally (expressive dysphasia) in part due to brain damage, sickness, or misadjustment.
- **Aphasia:** Impairment of one's linguistic abilities, including their capacity to understand, use, and create meaning from spoken, written, & nonverbal communication. Auditory aphasia could be to fault.

(2) Reading Disabilities

- **Dyslexia:** A serious deficit in one or more linguistic abilities (listening, speaking, reading, writing, or spelling). This condition manifests itself in a diminished capacity to read or comprehend spoken language.
- **Alexia:** The inability to read any written or printed content
- **Hyperlexia:** Problems understanding written material despite superior oral reading ability.

(3) Writing Disabilities

- **Dysgraphia:** A significant inability to produce legible handwriting at a rate commensurate with one's age. Impairment in the formation & executing of motor patterns necessary for writing or copying letters, words, & numbers.
- **Agraphia:** It's a term used to describe someone who is completely incapable of putting their thoughts on paper.
- **Spelling problems:** Learning disabled students tend to have poor spelling.
- **Dysnomia:** Disabled memory to recall important names or words for use in speech or writing.
- **Dyspraxia:** A significant inability to draw, write, or button, or to sequence the necessary movements, due to problems with fine motor skills.

(4) Arithmetic Disabilities

- **Dyscalculia:** Extreme difficulty with the mathematical concepts, notations, or procedures necessary for progress. It entails a limited capacity for mathematical reasoning.
- **Acalculia:** Failure to recognize place value or perform arithmetic operations because of an inability to read or write single numbers or their series in the spoken manner (fifty-one =51¬ as 501).

(5) Phonological Difficulties

Problems understanding, generating, or expressing the individual phonemes that compose words.

(6) Social awareness & Communicative Difficulties

Communication & social skills that fall short of expectations (could be associated with or defined as Asperger's, high-functioning Autism, semantic-pragmatic disorders, or visual-perceptual/non-verbal challenges).

(7) Expressive/ Receptive Language Difficulties

A difficulty in either the production or comprehension of language due to a deficit in motor control or mental organization.

(8) Processing Speed Difficulties

Disabilities that prevent a youngster from learning to read and write at a typical rate. While some kids may have average writing or reading skills, their processing may be delayed and difficult due to cognitive, perceptual, or motor problems.

(9) Auditory Perceptual Problem

Challenges in listening & understanding spoken language. Because of this issue, the sufferer's hearing is often impaired. A mistake in sequencing or discrimination can completely alter the significance of the message at hand. Some difficulties with hearing perception include:

- **Auditory Discrimination Problem** – Hearing "seventeen's" instead of "seventy" or a furious rather than joking tone of voice. Difficulty distinguishing between alike sounds including "th" & "f" or "m" & "n".
- **Auditory Figure-Ground Problem** – Difficulty distinguishing a desired sound from other, competing sounds; as in, failing to hear the phone ring while listening to the radio, or unable to understand conversation at a social gathering with loud music playing.
- **Auditory Sequencing Problem** – Problems with hearing the correct sequence of sounds, such as mishearing "nine-four" or "four-nine," mistaking "treads" for "street," or hearing music as jumbled as the melody is interpreted out of order.

(10) Catastrophic Response

A sudden and uncontrollable response to a shocking or upsetting experience. It's possible that this would cause someone to "freeze" for a moment, lose their anger, or become disoriented & ignorant of their surroundings.

(11) Cognitive Disorganization

People with this disorder have trouble thinking clearly & rationally, which causes them to make rash judgments & poor plans.

(12) Crossing the Midline

Difficulty in reaching the center of one's body with one's arms or legs. This may manifest as a lack of dexterity in writing, sweeping, or even driving.

(13) Directional Problem

Disorientation in recognizing left from right, or in learning cardinal directions, or in figuring out the plan of a vast, symmetrical building.

(14) Inter Sensory Problem

Problems combining or associating sensory input, such as failing to recognize that the visual representation of the letter "d" corresponds to the audible representation of the letter "d"; failing to register a tap on the shoulder while reading; and failing to follow a conversation while simultaneously operating a motor vehicle.

(15) Memory Problem

Short-term memory loss; difficulty recalling recent events (even if only a few minutes ago). If you have a bad memory, you could struggle in school.

(16) Motor Problems

Difficulty coordinating one's physical actions to produce the desired result. Examples of motor difficulties include:

- Perceptual Motor Problems, in which one has difficulty executing a task that necessitates coordination due to faulty sensory input. This can lead to mobility issues like clumsiness, trouble with even basic sports, and stiffness.
- Visual motor dysfunction, Difficulty coordinating visual perception with motor execution; for example, difficulty mimicking a teacher's dance moves, writing from a blackboard, or hitting a target after releasing an object.
- It's possible that someone with an auditory motor problem would have trouble following directions given verbally, coordinating movements to music, or retaining the content of a presentation.

(17) Perceptual Problems

Impairment in sensory perception and/or cognitive processing.

(18) Proprioceptive Problem

Problems determining one's spatial location. Having this condition might make it difficult, if not impossible, for a person to determine where her limbs are when she closes her eyes.

(19) Soft Neurological Signs

Staring, rotating the head instead of moving the eyes, not looking someone in the eye, not maintaining the head straight, & being quickly shocked are all signs of a dysfunctional central nervous system.

(20) Tactile Perceptual Problem

Difficulty processing tactile information. Among the many tactile impairments are:

- **Immature Tactile System** — Affected individuals have an aversion to gentle touch but a want for pressure touch, such as a tight hug or a knee-to-chest huddle. The growth of tactile discrimination is dependent on the maturation of the individual.
- **Tactile defensiveness** — the tendency to avoid physical contact due to a less developed sense of touch.
- **Tactile discrimination disorder** — inability to recognize the distinction between objects with similar textures, such as bond & ordinary typing paper, light & heavy sandpaper, silk & cotton, and ripe & unripe cantaloupe.
- **Tactile Pressure Problem** — Difficulty Judging the Appropriate Force Necessary to Perform Motor Acts, Such as Holding an Egg in Two Fingers Without Dropping It or Tapping Somebody Jokingly Instead of Hitting Them.

(21) Vestibular Perceptual Problem

Difficulty maintaining one's equilibrium, as evidenced by many stumbles when attempting to step off of a curb.

(22) Visual Perceptual Problem

Having difficulty seeing clearly and/or digesting what you see can be frustrating. Among them are some of the following:

- **Visual Figure-Ground Problem:** Difficulty discerning a target object from its distracting surroundings, such as when trying to locate a person's face in a crowd, a set of keys on a cluttered desk, or a specific passage of text within a book. Keys on a cluttered desk are invisible to those who suffer from this condition.
- **Visual discrimination deficits** include not being able to tell the difference between, say, the letters "v" & "u" or "e" & "c," or between two different but similar shades of the same color, or between two different but visually similar types of leaves. This individual confuses the two identical objects.
- **Depth perception disorder:** having trouble gauging how far away (or how close) an object is. This could cause us to misjudge the distance to the fork in our hand, or the

height at which we need to place the glass of water on the table.

CHARACTERISTICS OF STUDENTS WITH LEARNING DIFFICULTIES

Students that have trouble learning are a diverse bunch. Some of them have difficulties with reading and writing. Some people have trouble understanding, while others may have trouble telling time or finding their way around a map. Because of this, it is challenging to list the features that are obvious in every student with learning challenges. The following are the most commonly cited indicators of learning difficulties:

1. **Ability Level:** Ability levels among students with learning disabilities span a wide spectrum, from above-average to almost average.
2. **Activity Level:** The student who has trouble learning may have behavioral issues, such as being either hyperactive or hypoactive. Hyperactivity manifests itself through actions such as fidgeting, tapping one's fingers or toes, getting up from a sitting position unexpectedly, and switching tasks frequently, and so on. If a person is hypoactive, they won't react quickly or at all.
3. **Attention Problems:** Learning disabilities often struggle to maintain focus on a single task for extended periods of time because of issues with attention. The person's focus narrows to a single, repetitive task, which may be either motor or verbal in nature.
4. **Motor Issues:** People who have trouble learning tend to have poor fine and gross motor coordination. They have trouble with touch discrimination, have a high tactile desire, and are unable to produce good writing or drawings.
5. **Visual perceptual issues:** The students have trouble differentiating between visual stimuli (visual discrimination), contribute to students' overall difficulties in the classroom. They have trouble differentiating between a figure and its context (visual figure-ground). They have trouble remembering and visualizing images or sequences. Moreover, they struggle to complete incomplete images or words (visual memory).
6. **Auditory Perceptual Problems:** Students with learning disabilities have issues with auditory perception, namely with auditory discrimination & interpretation of spoken and ambient noises (auditory comprehension). Because of this, they have trouble paying attention to relevant auditory cues, and instead have to force themselves to ignore all except the most crucial ones (auditory figure-ground).
7. They have a hard time remembering auditory stimuli or sequences & difficulty completing words when only fragments are heard (auditory memory).

8. **Difficulty with the Language:** Students with learning disabilities often have trouble with speech articulation & ability to put together phrases & sentences.
9. The students who have LDs tend to be impulsive & issues with their social & emotional well-being. They don't consider the possible outcomes of their actions. Their behavior can become violent at times. When provoked, they act in unusual ways, even to the point of tantrums. Because of this, they are unable to function in social situations. Generally speaking, their social skills are below par for their age and level of development. The inability to adapt to new situations is a major flaw in these people. They have extreme mood swings, even within the span of an hour.
10. **Orientation Issues:** Students with LDs often have a skewed sense of where they fit in the world and a confused view of their own bodies. They have trouble gauging distance & size, as well as distinguishing between objects & backgrounds, and between portions and the total. They have difficulty understanding time concepts such as the past, the present, and the future.
11. Students with learning disabilities have poor work habits, including a lack of organization. They take their time getting things done and often make mistakes because they are in a hurry.
12. Students with learning disabilities have trouble with basic academic skills like reading, writing, mathematics, spelling, telling time, or even finding their way around a map.

Students with learning disabilities typically exhibit these features. These traits may be present, but they certainly aren't required for a student to have learning issues. One or more of these traits may be present in a student with learning challenges.

CONCLUSION

E-learning systems are becoming increasingly massive due to the proliferation of users, services, educational content, and available resources. Providing scalability & reliability of educational apps and services is one of the fundamental challenges in creating the environment for an e-education system. Cloud computing resolving the drawbacks of E-learning and improve it efficiently. Cloud-computing-inspired infrastructure is one approach being considered. Although there is not a consensus on what "learning disabilities" are, the term is defined legally. A learning disability is "a disorder in one or more of the basic psychological processes involved in comprehending or using language, spoken or written, that might manifest itself in an imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations," as stated in Public Law.

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