Journal of Advances and Scholarly Researches in Allied Education
Vol. 19, Issue No. 4, July-2022, ISSN 2230-7540

An Analysis the Cloud-Based E-Learning and types of Learning Disability

Nazia Ahmad[1]*, Dr. Kailash Karande[2]

[1] Research Scholar, Department of Computer Science Engg, Himalayan University, Itanagar, Arunachal Pradesh

[2] Assistant Professor, Department of Computer Science Engg, Himalayan University, Itanagar, Arunachal Pradesh

Abstract- Education is important aspect of every person's life and no anyone can improve their ability and innovative skill without education. Now days in rural area student faced many hurdle in their educational life such as, lack of infrastructure, lack of E-learning facility, long distance of school, old method of teaching. This all kinds of problem influence on student learning ability and interest. Another problem in learning process is learning disabilities, in propose research we examine two types of learning disabilities infrastructural and neurological this both disabilities are not present in handicapped categories and this learning disabilities mostly present in rural student due to lack of facility and educational environment. Cloud computing is internet based technology use to provide resources and application on demand. Student can access and utilizes cloud resources anywhere any time using their own devices like laptop, mobiles, and tablets.

Keywords- Cloud Computing, Education, E-Learning, Disability

----------X----------

INTRODUCTION

Cloud computing is rapidly emerging as a new paradigm for delivering computing as a utility [R. Buyya 2009]. It allows leasing of IT capabilities whether they are infrastructure, platform, or software applications as services on subscription oriented services in a pay-as-you-go model. Cloud computing will be the fifth utility services after water, electricity, gas and telephone to be utilized as a computing services for our daily life routines [R. Buyya 2008]. A comprehensive online platform made up of many different services that can be employed as needed is proposed by cloud computing technology (R. Buyya, 2013). Through the internet, cloud computing offers its services in a dependable & effective manner that is both cost-effective [R. Buyya 2013]. By offering services on a rental basis, cloud computing lowers the expenditure required to buy hardware, software, & software licenses [P. Pocatilu 2010]. It offers backups to maintain multiple copies of the data and lowers the cost of licensing. Scalable & adaptable technological infrastructure capabilities are offered by cloud computing technology as an on-demand service [P. Pocatilu 2014]. Users of mobile computing devices like laptops, smartphones, tablets, or mobile phones can access cloud-based services from any location, at any time, and via any mobile computing platform. The ability to dynamically provision, configure, control, & reconfigure machines with huge data centers to deliver services in a scalable way is a feature of cloud computing technology [P. Pocatilu 2012]. As per E. Zaharescu (2012), cloud computing enables effective management of updates, maintenance, backups, disaster recovery, & failover services. As per Vaquero et al. [2008], the infrastructure provider offers cloud guarantees through customized Service Level Agreements (SLA). According to R. Kop (2011), cloud computing addresses the potential issues of terrorism, economic growth, climate change, & education.

Cloud Computing Service Models

In accordance with a layered architecture, cloud computing offers its users three service models, as depicted in figure 1: 1) software as a service, 2) platform as a service, & 3) infrastructure as a service.

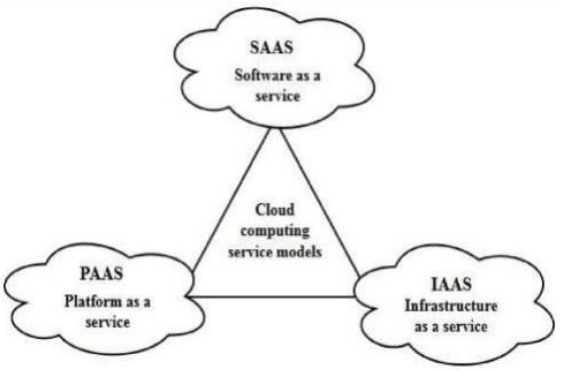

Figure 1 Cloud Computing Service Models

The many layers of cloud computing service models are described in the Buyya [2010] reference model.

Software as a service (Saas) - SaaS are the most popular service models that end customers can access. Online software services are becoming more and more popular among users as opposed to locally installed computer programs. Software maintenance is no longer a local system burden thanks to the deployment of SaaS service models [B. Hayes 2008].

Platform as a service (Paas) - The programmable layer of service model, or Paas, is the second abstraction layer that is utilized by programmers to create & deploy their applications in cloud environments. Developers are not required to be familiar with the hardware setup used by the cloud. Different sorts of development environments are available for developers to use & program in. For data access & authentication, the Paas platform offers a variety of specialized services [R. Buyya 2010].

Infrastructure as a service (Iaas) - A third layer of service architecture called IaaS controls how physical resources are used in the cloud. In the cloud computing context, it manages the virtual machines or other virtualized resources that are used on demand [Sotomayor 2009]. Various operating systems and specialized software stacks are used by infrastructure as a service [D. Nurmi 2009]. This layer offers the on-demand provisioning of servers that are currently operating to meet various customer requirements.

Cloud Computing Deployment Models

Users of cloud computing today accept a variety of deployment models [Mell 2009]. Figure 2 illustrates how cloud computing can be divided into public, private, community, & hybrid models.

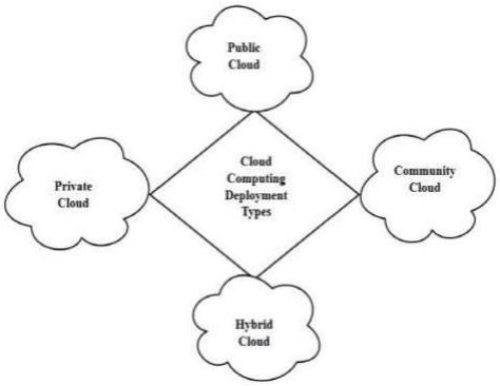

Figure 2 Cloud Computing Deployment Types

Public cloud- According to M. Armbrust (2009), the general public can use public clouds using a pay-as-you-go consumption model. The assets of the cloud service provider are where the cloud resources are hosted.

Private cloud- Private clouds are configure, operate, & managed for a company's internal usage alone; they are not accessible to the general public [Mell 2009]. Users of private cloud can communicate with their neighborhood data center while still enjoying the benefits of public cloud.

Community Cloud- A specified community with shared resources or interests is supported by community clouds, which are shared by a number of organizations. These clouds may be off-premises or on-premises and are maintained by a third party.

Hybrid cloud- Hybrid clouds are created by fusing public & private clouds with standards technology that supports data & application portability. The majority of the organization has chosen the hybrid model.

E-LEARNING & CLOUD COMPUTING

Most learning institutions have their very own custom-built computer center. As it is, the current resource use rate is inefficient. After a period, the computer center's resources won't be enough to support the needs of research and education, and keeping it running will cost too much. Laboratory exercises & practical tasks necessitate the most up-to-date technology available, as well as specific software. For this reason, e-learning infrastructure systems need to be implemented in a new way to make better use of existing resources.

In order to best serve the needs of students and faculty at universities, it is essential that a new model of IT infrastructure be created, one that is founded on the idea of cloud computing. The term "cloud computing" refers to a business model & technological platform that have developed as a result of the convergence & blending of numerous previously separate computer developments. Learning institutions can make better use of their current resources & gain a fresh perspective on the scalability and stability of their apps, software, and e-learning system thanks to the cloud computing infrastructure. Adopting the cloud computing concept and its characteristics can enhance productivity & hardware / software resource management, all of which are crucial for offering e-education features, analytical & research activities, and student projects [Caron E 2009].

The information technology (IT) infrastructure of a university or college consists of the hardware, software, computer network, and associated facilities used to deliver cutting-edge services and network resources, an online presence, and channels of communication with other academic and research institutions. Most e-learning system assets are deployed & assigned to specific activities or services, & physical machines are typically organized in a straightforward, specialized stack. The increased availability of resources brings with it the additional challenge of effectively putting them to use. A considerable volume of course materials is produced throughout the educational process,

further straining already limited means. Competition for access to few resources is a major obstacle to the successful deployment of IT in the academic setting.

Cloud Computing Based Learning

The cloud computing paradigm refers to a highly scalable, abstract computing infrastructure that is made available to end users online [N. Sultan 2010]. By utilizing cloud computing technology, the academic sector will reduce the total cost of ownership, which will have a favorable impact on the cost structure for IT resources [U.J. Bora 2013]. Due to its adaptability and pay-per-use business model, cloud computing will greatly benefit & empower the academic sector. E-learning refers to education created via the use of technology. Internet-enabled learning is what is referred to as e-learning [D. Hauger 2007]. A community of learners, content creators, specialists, & developers online is one of the elements of e-learning, along with content in a variety of formats & management of the learning process. The ease of accessibility, flexibility, consistency, convenience, & repeatability are only a few benefits of e-learning. The cloud computing technology satisfies all of the requirements for e-learning, including simple accessibility, adaptability, consistency, ease, and repeatability [U.J. Bora 2013]. One of the key forces influencing education will be cloud-based learning [M.A. Conde 2013]. As educational services may be provided in an effective and dependable manner, cloud computing is an infrastructure that can provide additional value to the e-learning environment [N.M. Rao 2012]. Pocatilu [2010] asserts that cloud computing provides e-learning with a number of advantages by providing low cost infrastructure with high data security, centralizing data storage, and regulating data access. With fast software updates, cloud computing provides great performance at a low cost [U.J. Bora 2013]. It offers online classes & assignments, as well as feedback, discussion boards, and total resource management. By offering a welcoming & simple environment to acquire concepts, cloud-based e-learning is a learner-centered model [A. Beloglazov 2011]. Teachers can analyze the areas of knowledge that students provide and keep their lesson plans current. The advantages of a cloud computing-based e-learning environment, according to [M.A.H. Masud 2012], include access over the web, the absence of client-side software requirements, & subscription-based billing based on usage. The learner community can save a vast amount of material in a repository provided via cloud-based e-learning. [S. Ouf& M. Nasr 2010]. Through the internet, the students are able to work from anywhere and on any computer. Students can participate in forums & discussions and submit online quizzes and exams. The ability to access the system from any location, at any time, and using any computing device affordably is a benefit of cloud infrastructure for educational system & their students [M. Despotovi-Zraki 2013]. E-learning powered by cloud computing provides interactive lessons, resource sharing & integration, content tracking, and student feedback for better results.

A Cloud Computing Infrastructure Model for E-Learning

By "cloud computing," we mean the practice of making available and utilizing computing resources over the Internet [Sultan N 2010]. It paves the way for instantaneous use of technological resources by making their associated services readily available. The term "cloud computing" was coined by Srinivasa RV Srinivasa in 2009 to describe the practice of offering users scalable information technology resources as a service over the Internet. It's a generic, scalable, and governed network of computers that serves as a backend for many user-facing software programs. In a shared and elastic pool of resources, both services and data can coexist [Jin H, Ibrahim 2010].

Use of cloud computing at universities boosts the dependability and scalability of e-learning software tools and apps, while also making better use of the current infrastructure. Considering how exclusively applications are assigned resources, it stands to reason that physical machines are employed for applications, or specific activities, to be done on that system. If a system is overloaded, installing more hardware will address the scalability issue. Adding new resources typically results in a price hike. With this in mind, it's clear that an alternative approach to the issue of scalability and resource use is required. Using the IT infrastructure effectively necessitates solving the issue of multiple users trying to access the same resources at the same time. Since cloud computing allows for the dependable and effective delivery of educational services, it can provide new value to an e-learning platform.

Faculty e-learning models typically consist of the following essential elements:

- E-learning services (identity management system, e-mail, learning management system, document management system, customer relationship management, portal services, etc.)
- Software building blocks such the Modular Object-Oriented Dynamic Learning Environment (Moodle), OpenNebula, LDAP, Apache, MySql, etc.
- It's important to consider:
- Customers (students, non-teaching staff, etc.)
- Network & hardware infrastructure

Network Infrastructure

Establishing an appropriate network infrastructure for online education must precede building the model of a cloud computing infrastructure. Information, communication services, and an Internet connection must be made available to staff, students, and

outside parties as part of the network's mandated infrastructure. The network must be highly available, scalable, and reliable in order to support the widespread adoption of e-learning and research. The system needs to facilitate cooperation between internal and external partners in dispersed research teams, in addition to staff and students. Among the most important requirements for a network's architecture are the ability to adapt to changing information needs and keep data secure. Furthermore, the infrastructure should make it simple and inexpensive to roll out new pieces of hardware & software in accordance with cloud computing principles.

A shared network architecture should be used for some parts of the network. A private cloud-based virtual network architecture is the other half of the network setup.

Categorize all service users as follows:

- Employees have the most extensive set of administrative rights & privileges across all services.
- Associates are granted less rights than full members.
- Access to the full complement of student services is secured.

The computer network's architecture & implementation make use of a hierarchical model. The concepts of hierarchy & modularity form the basis of this design. Using this concept, a complicated network can be partitioned into layers, with each layer serving a distinct purpose. In Figure. 4 we see a schematic of a hypothetical computer network.

The network's core, or "backbone," layer is of paramount importance. Because it allows devices in the distribution layer to communicate with one another, it must have high availability & redundancy. This layer must be capable of large data rates with low latency because it collects traffic from all central layer devices (routers and switches) in the distribution layer. Security is a major concern at this level. High-performance devices must be implemented on this layer in order to process massive volumes of data and establish Internet connections.

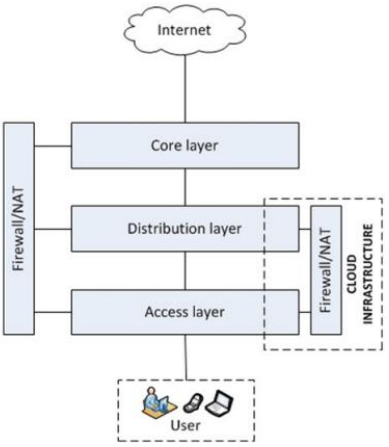

Figure 3 Conceptual logic networks scheme

In a network, the distribution layer connects the core & access layers. This layer's responsibility is to consolidate information from the access layer before sending it on to the "core" of the network. By deploying routers or VLANs, the distribution layer can manage traffic flows according to predetermined policies and by creating specific broadcast domains (VLAN). High-performance components are located here. Through the use of redundant hardware, we are able to ensure a consistently high level of availability. The cloud is used to host a portion of the distribution layer's necessary virtual network infrastructure.

In addition to being the interface between the network and its customers, the access layer is in charge of connecting the customers' devices to the rest of the network. Modems, switch, hubs, & wireless access points, along with endpoint devices (computers, printers, IP phones, and so forth.), can all be found here. This layer's major function is to link nodes to the network & provide access control to define which nodes can communicate with one another.

Firewalls and NATs are components of a network's infrastructure that monitor and manage data transmissions at the network's perimeter. The primary function of this section of the network is to regulate datagrams according to predetermined policies. When an IP packet travels via a network router, its IPv4 header undergoes a process known as network address translation (NAT).

The cloud computing infrastructure incorporates some of the network's access and distribution levels. With this method, cloud-based learning and research services can evolve further.

There are many upsides that can be realized by adopting a hierarchical structure. By resolving the issue of extreme transmission traffic on the network, the hierarchical architecture relieves the CPU burden on the devices in the network. In addition, a hierarchical model-based computer network can be implemented at a lower cost. Devices with well-

defined roles are planned at each tier to prevent the needless procurement of complex machinery. The modular design philosophy streamlines the system development process. Because the whole network is viewed as a series of layers, testing & troubleshooting in the network is facilitated. Since a smaller subset of devices & services will be affected by network changes in the hierarchical model, its implementation is simpler.

LEARNING DISABILITY AND LEARNING DISORDER

Learning disability is a classification including several areas of functioning in which a person has difficulty learning in a typical manner usually caused by an unknown factor or factors. While learning disability and learning disorder are often used interchangeably, the two differ. Learning disability is when a person has significant learning problems in an academic area. These problems however, are not enough to warrant an official diagnosis. Learning disorder, on the other hand is an official clinical diagnosis whereby, the individual meets certain criteria as determined by a professional (psychologist, pediatrician, etc). The difference is in degree, frequency, and intensity of reported symptoms and problems and thus the two should not be confused. The unknown factor is the disorder that affects the brain ability to receive and process information. This disorder can make it problematic for a person to learn as quickly or in the same way as someone who is not affected by a learning disability. People with a learning disability have trouble performing specific type of skills or completing tasks if left to figure things out by themselves or if taught in conventional ways.

TYPES OF LEARNING DISABILITIES

Learning disability is a broad term. There are many different kinds of learning disabilities. Most often they fall into three broad categories:

- Reading disabilities (often referred to as dyslexia)
- Written language disabilities (often referred to as dysgraphia)
- Math disabilities (often called dyscalculia)

Other related categories include disabilities that affect memory, social skills, and executive functions such as deciding to begin a task.

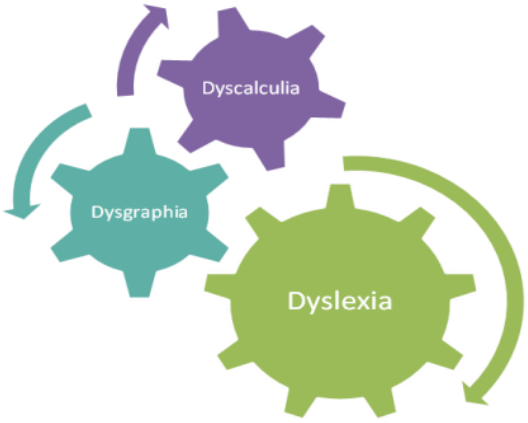

Figure 4. Types of learning Disability

Dyslexia (Reading Difficulties)

In addition to having difficulty spelling & decoding, dyslexia is defined by issues with accurate & fluent word recognition. 2 to 8% of students in elementary schools struggle with reading.

Dysgraphia (Writing Difficulties)

Additionally, writing uses a variety of brain regions & processes. The brain's memory, hand movement, vocabulary, & grammar networks must all be in good functioning order. Any of these issues could lead to a developmental writing disorder. An expressive language issue, in instance, may make it difficult for a kid with a writing handicap to construct entire, linguistically sound sentences.

Dyscalculia (Mathematics Difficulties)

Recognizing numbers & symbols, learning facts, arranging numbers, and comprehending abstract ideas like place value & fractions are all part of arithmetic. For kids with developmental arithmetic difficulties, often known as dyscalculia, any of them could be challenging. Early on, issues with math or fundamental concepts are likely to surface. In later grades, disabilities are more frequently associated with issues with reasoning.

CONCLUSION

Learning difficulties is a dynamic and expanding field. Learning difficulty individuals are found across all ages, socio-economic levels, and races and their problems range from mild to severe. At this juncture, to meet this challenge effectively, the teachers should have through knowledge and understanding of the nature of learning difficulty and the process of diagnosis of academic and non-academic problems emanating among students with learning difficulties.Today, traditional learning methods can be transformed into modern learning methods in a cost-effective way if the Indian government can deploy cloud-based E-learning in rural education.

REFERENCES

1. Abdi, A. (2014). The effect of inquiry-based learning method on students' academic achievement in Science course. Universal Journal of Educational Research. 2(1), 37-41. doi: 10.13189/ujer.2014.020104
2. Abdullah, S. (2010). Effects of cooperative technique Jigsaw II on academic achievement and attitudes to written expression course. Educational Research and Reviews. 5(12), 777-787. Retrieved from http://www.academicjournal.org. article /article1379656063 sahin.pdf
3. Acker, R. L. (1994). The influence of group guidance on the self-esteem, acceptance of disability, and academic achievement of children with learning disabilities (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 9604258).
4. Adaval, S. B. (1952). An investigation into the qualities of teachers under training. Unpublished Ph.D thesis, Allahabad University.
5. Affleck, J. Q., Madge, S., (1988). Integrated classroom versus resource model: Adams, A. and Academic viability and effectiveness. Exceptional Lowenbraun, S. Children, 54, 339 – 348.
6. Agarval, M. P. (1969). Measurement and competence of teachers of primary school (M.P). Ph.D thesis, Sagar University
7. Aiken, L.R. (2000). Psychological testing and assessment (10th ed.). MA: Allyn and Bacon.
8. Ainscow, M. and Muncey, J. (1989). Meeting individual Needs in the primary school. London: David Fulton publishers.
9. Aker, G. F. (1962). The identification of criteria for evaluation graduate programmes in adult education. Unpublished Doctoral thesis, University of Winsconsin.
10. Akhondi, A. (2011). The effective multimedia instruction in remedy spelling disability students specific learning in Iran. Procedia- Social and Behavioral Sciences, 3(15), 1951–1954. doi:10.1016/j.sbspro.2011.04.033
11. Al Zyoudi, M. (2010). Differences in Self-Concept among Student with and without Learning Disabilities in Al Karak District in Jordan. International Journal of Special Education, 25(2), 72 77.
12. Alderman, M. K.(1990). Motivation for at risk students. Educational Leadership, 48 (1), 27 – 30.
13. Alexander, D. (1999). Keys to successful learning: A national summit of research on learning disabilities. New York: National Center for Learning Disabilities.
14. Aludiapillai (1993). Motivating the teachers. The Hindu, October 22, p. 26.
15. American Academy of (1987). Policy statement: Learning disabilities, dyslexia, Opthalmology and vision. Journal of Learning Disabilities, 29(7), 412 - 413.
16. American Academy of (1998). Learning disabilities, dyslexia, and vision. Pediatrics Pediatrics, 102(5), 1217 – 1219.
17. American Psychiatric (1994). Diagnostic and statistical manual of mental Association disorders (DSM IV). Washington, DC. : APA. 213
18. ammill, D.D., Leight, J. E., Mc Nutt, G., and Larsen, S. G. (1981). A new definition of learning disabilities. Learning Disability Quarterly, 4, 336-342.
19. Anderson, L. M., (1980). Dimensions in classroom management derived Everston, C. M. and from recent research. Journal of Curriculum Emmer, E. T. Studies, 12, 343 – 346.
20. Anderson, L. M., (1985). A qualitative study of seat works in first-grade Brubaker, N. L., Allen - classrooms. Elementary School Journal, 88, Brooks, J and Duffy, G. G. 123 - 140.
21. Anderson, L. M., (1991). Teaching writing with a new instructional model: Raphael, T. E., Englert, C. S.Variations in teachers beliefs, instructional practice and Stevens, D.D. and their students performance. Paper Presented at the Annual Meeting of the American Educational Research Association, Chicago, IL.
22. Anilakumari, M. C. (2012). Developing a multimedia remedial tracking package for dysgraphia among primary school students with specific learning disabilities (Unpublished doctoral dissertation). M. G. University, Kottayam.
23. Anna Elizabeth Kuruvilla (1999). Creativity among the learning disabled children. Unpublished M.Ed Dissertation, Avinashilingam Deemed University Coimbatore.

Corresponding Author

Nazia Ahmad*

Research Scholar, Department of Computer Science Engg, Himalayan University, Itanagar, Arunachal Pradesh