Online Education Resources for Students with Disabilities and Cloud-Based E-Learning Architecture for the Treatment of Learning Disorders

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Abstract- 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. When it comes to e-learning & use of educational apps, software, and systems, the cloud computing environment provides new opportunities. Learning impairments are another issue that must be addressed in the classroom. In the study proposed here, we look at two distinct forms of learning disorders infrastructural and neurological that are not seen in disabled populations. We have developed a cloud-based E-learning architecture for the treatment of learning disorders. We will study on the Tapi district in order to identify the learning difficulties. Our research, where we will develop two cloud-based frameworks to address these issues.

Keywords- Disabilities, E-Learning, Cloud-Based Frameworks, Education

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INTRODUCTION

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 students 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. In current scenario of rural education include traditional tools and methods for education. In previous 4 year ago government of Gujrat provide well equipped ICT lab in Tapi district. Present research suggests that simply putting computers into schools is not sufficient to influence student learning. That said, individual deployment and use of ICT can positively influence student knowledge, improve skills and attitudes, as well as training practices, school revolution, and community services. In village school ICT Based E-learning provides many benefits like, student result such as maximum scores in school subjects or the learning of entirely enhancive skills required for improving economy.

IMPLEMENTATION OF CLOUD COMPUTING FOR LD

Present research design cost effective framework for ILD and NLD student that are easily implemented in rural school. Now days in rural school ICT lab are available to providing E-learning through computerized software. But this E-learning terminology only suitable for normal student and it has needed to properly maintain, update and install. For solving all those expensive aspect of E-learning we can do analysis of Rural education and design cost effective and reliable cloud deployment model that provide all educational services and application for student with learning disabilities.

Implementing cloud based computing technology we can overcome all those short comes and maintain centralized system where all authorities that can be monitor and check the education system from every minor aspect and continue guide the system. They make sure that every student, including those with disabilities, receives a quality education in addition to checking and monitoring the educational system. The Indian educational system has adopted e-learning technology, but only for regular students. The aim of our research is to design a system that would work for both regular students and students with disabilities. Cloud computing is an internet-based technology that allows users to retrieve shared resources & single parallel infrastructure that provides service on demand over the internet to perform cloud computing operations. Educational

cloud services that will be helpful services are available to students online. Cloud computing is modified extension of concept of distributed system.

For providing cloud based model for E-learning that can be used four deployment strategies to implement cloud based E-learning. It is for the common public to use resources, web services, and application supply through internet. Private cloud computing deployment model are utilized by the organization internally and is for an individual organization. Any subscriber within the organization can access the data, services and web application. Hybrid cloud deployment strategy provide common environment in which multiple internal or external supplier of cloud services are used in various environment. The community cloud infrastructure is shared among multiple organization with similar requirement and interest. The capital expenditure cost for its establishment are less because it shared among multiple organization.

Cloud computing provide multiple services to student for accessing and deploying their own application. Mainly cloud provides three services such as, SaaS, PaaS, and IaaS.

Software as service provider supply software services on cloud user can uses these services as software & complete his work without install it in client machine. GOOGLE APPS, FACEBOOK, GMAIL, SALE FORCES, BASE CAMP provide this services, using these services student creates document and spreadsheet online without installing any documents of spreadsheet application. This service reduces installing cost of software and expense of purchasing license copies of software.

Platform as Service provider allows users to use cloud computing for building or developing any application using developing kit provide by cloud computing users does not need to install development kit in cloud computing. This service provide application development platform to student without pay any platform cost.

Infrastructure as service model provide storage and compute resources as a service which can be used by IT organization and developer virtual private server in IaaS provide complete flexibility to consumer in choosing desktop or network resources.

We design two frameworks for disabled student to provide enhance technology in E-learning process, one framework for ILD student that are design to solve the problem of infrastructural learning disabilities and second framework are design to provide assistive technology through cloud computing it enhance educational evaluation of disabled student.
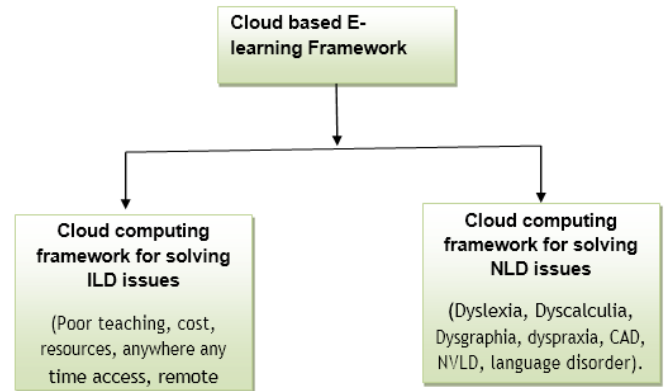

Fig 1: Types of cloud based E-learning Framework

University/Educational Board:

In Gujrat state there are many university are place across multiple region. In our present research we study 65 schools in Tapi district and that can be place under Nasik division educational board. In present cloud based E-learning framework for infrastructural disable student are providing facility through university/ Educational board portal. University/ educational board can be manages student private and academic data and stored it on private cloud. The responsibility of Educational board is to maintain all student data and provide schedule and syllabus content of Academic year. In cloud based E-learning framework Educational board can create academic E-learning data and video audio lectures, EBooks, Educational application for student. Educator also interacts with Educational board to know what are academic schedule and activity and access expertise lectures and instruction for effective teaching.

- Collect student private and academic data
- Maintain all school record and stored it into private cloud
- Create academic schedule and syllabus content
- Manage online communication facilities with subject expertise
- Provide student and school data to private cloud for information management
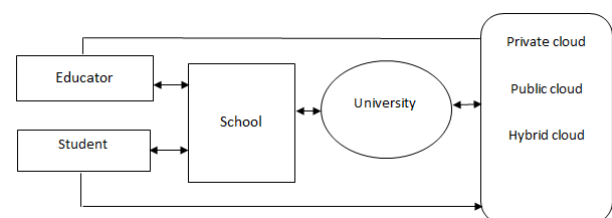- Create video, audio, eBooks for student E-learning.

Fig 2: University/Educational Board Interaction between School and Cloud computing

Educator and student can be interact with school environment and also access the cloud environment

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for uploading and deploying application using cloud computing environment. University/ educational board collect all school data for student management and stored this data in private cloud. Using this cloud based E-learning framework educator can be uploading educational content and assignment for student and student will be solve and upload this complete assignment for assessment. This framework can provide facility to access study content and learn anywhere anytime using computer, mobiles, and tablets without any requirement of expense, storage and access tools.

Public Cloud for education:

Cloud deployment model are easy to use and deploy general public are called public cloud. The cloud resources, infrastructure & storage are made to general client or student for free or on pay – per- use model. Public cloud is hold by a company carry cloud services. It is for the general publics, where resources, web application, web services are provided over the internet. Student in rural area are easily access the educational content using private cloud and this all resources are available to student 24 hours, anytime anywhere using their personal devices.

Private cloud for Education:

In private cloud infrastructure is handle for a individual company it may be handled and operated host organization or a third party. Private cloud deployment model are utilized by the organization inside and is for an individual organization. University/Educational Board will be managing all data of private cloud and any subscriber within the Educational board can fetch the educational information, web services and web application. But external client cannot access the cloud. Private cloud can be providing service and security for private data of organization.

Cloud service provider:

A cloud computing provider is a company that offers some element of cloud computing SaaS, IaaS or PaaS – to other businesses, institution or individuals. Cloud providers are sometimes referred to as cloud service providers. Software as service model is highest level model of cloud computing service pyramid. SaaS deliver a single application through browser to multiple client or student using multitenant architecture. Student of SaaS can use application on license basis, in a pay-as-you as go SaaS service model is beneficial to student because it has not need to purchase software or hardware. It reduces the cost of uniform investment in server or software development, on the provider side with just one app to maintain cost are low compare to conventional hosting.

In our research we study the application of cloud computing in education for solving environmental as well as neurological disabilities in rural education. Cloud computing give new vision to education system

to enhance education system in rural education system. Educational cloud computing deployment indicate enhancive types of services easily available on web and it is useful for student, faculty, staff, cloud provide many application to provide services like Google, Microsoft, Amazon, HP, Salesforce, Amanda and Zmanda, Amazon web services provide highly scalable cloud computing platform for school and institution.

A. Amazon Cloud Services in Education:

Amazon cloud services provide dynamic manipulation ability in the cloud computing environment for education. It is mostly design to make web scale computing easier for developed Amazon cloud services offer many services.

Fig 3: Amazon Cloud Services

CLOUD BASED E-LEARNING FRAMEWORK FOR NLD PROPOSED

The major problems in rural education are neurological based learning disabilities that effect on student educational life and their behavior in social, familiar and professional life. The situation of learning disability explores neurobiological based learning disorder in this condition student with learning disorder are not properly adopt learning concept due to low interpretation and abnormal condition of brain. The proposed cloud based E-learning framework for neurological based disabilities is provide enhance E-learning facility to rural student. Only E-learning tools are not applicable to effective learning because impact of E-learning is only accessible for normal student. We need to modify E-learning technology with cost effective approach that solve the problem of neurological based disabilities in rural education.

The proposed cloud based E-learning framework will be provide assistive tools through cloud based E-learning that are feasible to student and student

with learning disability will be easily learn like normal student. Cloud computer provide software as service, there are many assistive software will be available in market that support for disabled student in learning process but each and every school in rural area are not able to purchase this assistive software for student with learning disabilities. The solution of this problem will be providing cloud based E-learning approach for NLD student. This proposed cloud based E-learning framework will be integrating all required assistive software that is use full to disabled student in learning process. Framework is interconnected with university portal and all the academic content and educational related activity is updated using cloud service provider. This all software services are made available to student at anywhere as per their requirement using their own device.
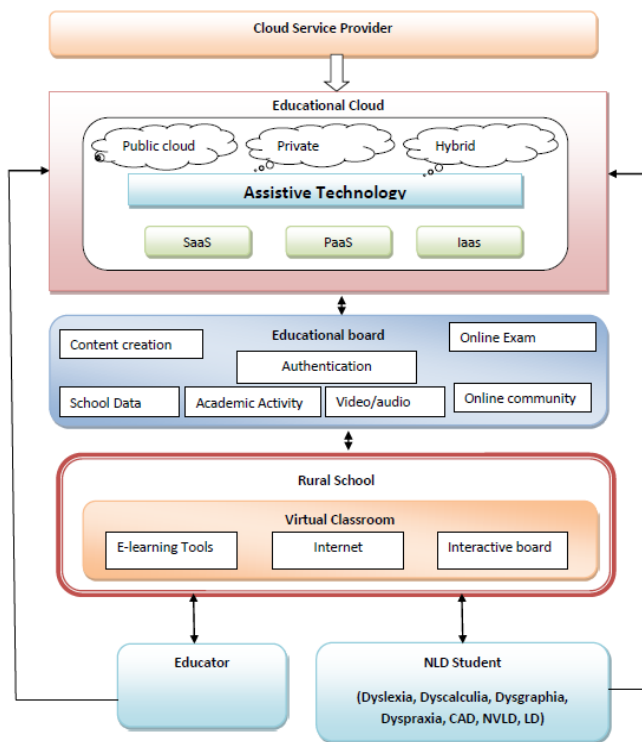

Fig 4: Framework for NLD

ASSISTIVE TECHNOLOGY THROUGH CLOUD BASED E-LEARNING

The terms assistive technology can be defined as any chunk of system or technology that help student with learning difficulties. Assistive technology is an important factor that is used to cooperate and provide advance learning tools and technology to disabled student. Assistive technology can provide services into two categories hardware and software. Hardware provides actual equipment and components that can be support to learning process. For example, central processing unit, the monitor and the motherboard and Software tools can be provide programs and application that run on computers, telling the computers what to do. The utilization of assistive technology is to work around individual shortfall, rather than find them.

It support student with learning differences and growing their learning efficiency and capacity.
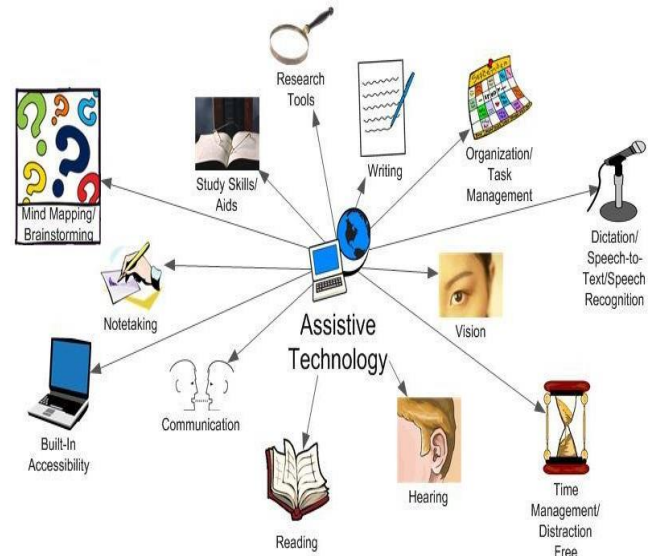

Fig 5: Assistive tools for Learning disability

Assistive technology is component based and program based technology that helps to those students that can be faced learning hurdle in their educational life. Examples of assistive technology contain advance technology to modernize traditional learning implemented for disabled student. This hi tech technology provide reading machine and book reader software that help to implement auto reading of book that help to correct pronunciation of word and student can do practice to improve their vocabulary and reading quality. Speech recognition systems also example of hi-tech technology deploy for auto writing. These systems allow the student to write stories by talking to a computer, rather than having to write the words out by hand. "Low-tech" devices contain more common, inexpensive tools. For example, Audio recorders tools enable student with memory or listening disorder to permanently percept spoken information. Dual types of assistive technology make life easier for student with neurological learning differences by permit them to collect information and present their own ideas using the method that works best for them. Instructional software, on the other hand, is built to develop or enhance specific skills in such region as reading, writing or math. Proposed cloud based E-learning framework for NLD can solve the problem of traditional learning and improve it using advance computer based technology. This framework will be providing assistive software that support student who has learning disability. In previous research work many researcher can be design and developed only Assistive framework for student but it is not affordable to student and school to purchase assistive software but in our present research framework we can implement Assistive software in educational cloud that can be stored and deploy at remote server and student or institution not need to purchase license copy of assistive software. Every

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educational entity can be easily access and use these resources through internet.

EFFECT OF CLOUD BASED E-LEARNING FRAMEWORK ON STUDENT WITH LD

The propose cloud based E-learning model can be provide new enhance techniques for student with learning disabilities. Framework for infrastructural disabilities reduces the cost of quality education and increases the quality of learning process. Following are the benefits of cloud based E-learning framework for Infrastructural disabled student

- Reduce cost of quality education

- Provide interactive way of learning

- Student can study anywhere anytime

- Access proper educational content in the form of multimedia

- Submit assignment online for assessment

- Improve student innovative power

- Communicate with expertise through online forum

- Teacher will be easy to read and upload E-education content.

- Student not need to high configure machine to install software

- Cloud provide storage and deployment facility remotely.

Following are the benefits of cloud based E-learning framework for neurologically disabled student

- Student can easy to access assistive tools for solving learning hurdle

- Cloud service provider supply multiple types of assistive tools for different form of neurological base learning disabilities

- It improve learning ability of disabled student

- This framework provides reading, writing, math's, application for disabled student.

- It improve the ability of disabled students and motivate it

- Cloud based learning provide expensive education and tools in free of cost

- Private cloud can be manage all student private data

- Educational board can be easy to provide and manage educational resources through cloud

CONCLUSION

The success of the educational system depends on its ability to accommodate students from a wide range of backgrounds. E-learning states to education conducted during the employ of electronic media. As a form of online education, e-learning fits this definition. Our current study integrates cloud computing with supportive technologies for students with disabilities. Disabled students in rural areas may not have access to the funds necessary to purchase assistive technology, cloud computing, these programs & apps can be made available to them at no cost. There are four distinct deployment models for the cloud: public, private, hybrid, & community. SaaS, PaaS, & IaaS are the three user services offered by the cloud.

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