# Role of Cloud Computing in Research

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**ABSTRACT:**
Education is an important part of keeping a country's economy growing. The way we teach in the classroom is changing, and students are becoming more interested in technology. In this changing world, it's important to think about how to use the newest tools to help teach and learn. Cloud Computing is one of the newest kinds of technology that are used today. By sharing IT services in the cloud, schools can outsource services that aren't as important and focus more on giving students, teachers, faculty, and staff the tools they need to do well. This paper is about how cloud computing affects the education system and how we can use that technology to give better education.
**KEYWORDS**: Cloud computing, higher education.

## I. INTRODUCTION

India's government wants parents to send their kids to school and college, so it has set up a number of programmes to support education. The different programmes get students to schools and colleges, but the lack of tools, good teachers, and the latest books and labs hurts their grades and makes them less likely to keep going to school. One of the biggest problems the government faces in offering education is a lack of infrastructure. If there is infrastructure, it needs to be kept in good shape. Getting and taking care of a wide range of gear and software requires a lot of money and the skills to keep them running.

These problems can be solved with the help of cloud computing. It's a network of computers that can be used by anyone from just about anywhere. So, by using cloud computing, we can get around all of these problems and keep a centralised system where all the authorities can check the education system from every angle and continue to guide and watch the system. They not only look at what the schools need, but also make sure that every student gets a good education and that his attendance, class performance, and other things can be kept track of without having to worry about the infrastructure.

The cloud helps make sure that students, teachers, parents, and staff can get to important information at any time and from anywhere, using any device. Institutions, both public and private, can use the cloud to offer better services with less money and manpower.

## II. LITERATURE REVIEW

Cloud computing has been around for a while [13, 14, 15], but the word "cloud computing" didn't become "popular" until October 2007, when IBM and Google said they would work together in this area [16, 17].After that, IBM announced their "Blue Cloud" project [18]. Since then, "Cloud Computing" is all anyone talks about. There is, of course, also the Wikipedia article [19].

It's possible that Amazon's release of the test version of its Elastic Computing Cloud (EC2) on August 24, 2006 will be remembered as the day Cloud Computing was born [Business Week 2006]. This offer, which gives flexible IT resources (computing power), is a turning point in the way IT users and providers do business.

The first time the term was used often was in 2007, which is shown by the fact that the first article in the English Wikipedia was written on March 3, 2007 and made a reference to utility computing. Today, Cloud Computing brings in more than 10.3 that Google finds. From simple infrastructure services like storage and calculation tools, Cloud Computing

has grown to include applications. But this meant that things like application service offering and Software as a Service, which came before Cloud Computing, would now also be called "Cloud Computing."

Distributed computing is the process of running a programme or application on many computers linked by a network. Cloud computing is an extension of this idea. The Internet makes it easy for anyone to do this, not just experts. The US National Institute of Standards and Technology (NIST) defines cloud computing as

"a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (such as networks, servers, storage, applications, and services) that can be quickly provisioned and released with minimal management effort or service provider interaction."

Cloud computing is a type of Internet-based computing in which shared resources, software, and information are provided as a service that computers or mobile devices can use when they want to. Cloud tech is already being used a lot in schools. Learners and teachers use cloud-based services every day to help with learning, socialising, making and sharing material, and working together. Google Apps, YouTube, Twitter, and Drop box are all cloud-based services.

The cloud offers many different kinds of services, such as:

1. Software as a Service (SaaS): apps you can use any time, any place. This is most important in schooling right now. Not only are the files and applications saved in the cloud, but the user only needs a web browser. Google Apps for Education and MicrosoftLive.edu are two of the most well-known examples. They offer contact and office tools like email and spreadsheets.

2. Platform as a Service (PaaS): The environment in which apps run. With PaaS, you can build new apps or services in the cloud that don't need a specific platform to run. You can then make them available to a large number of people over the Internet. PaaS offers services for testing, deploying, collaborating on, hosting, and managing applications, as well as tools for building apps in the cloud. Microsoft's Azure Services Platform, Salesforce's Force.com software platform, Google Apps Engine, Amazon's Relational Database Services, and Rackspace Cloud services are all examples of PaaS (Microsoft, 2012).

3. Infrastructure as a Service (IaaS): The data centres that you can use when you need them. Here, customers can rent basic computing tools like processors and storage and use them to run their own operating systems and applications. You only pay for what you use, and the service gives you all the space you need. However, it's up to you to keep an eye on, manage, and fix your on-demand infrastructure. IaaS is great because it lets you use a data centre in the cloud without having to add new hardware or wait for the hardware procurement process. This means that a school, college, or university can offer IT resources that might not be offered elsewhere. For example, Amazon's Elastic Compute Cloud lets organisations run Linux servers on virtual machines and increase usage as needed.

**PRESENT EDUCATION SYSTEM**

Most private schools rely heavily on information technology to meet their needs. Faculty and students can get to these services more and more through web browsers and Internet devices. The services are cheap or free for education, and they are often available much more often than what the educational institution can give.

So, are we looking at a future where most educational services will be hosted in the cloud and institutions won't have their own data centres with expensive hardware, power bills, staff salaries, and computing tools that are rarely used to their full potential? In this policy brief, some of the new benefits and problems of cloud computing for the education sector

have been looked at. But IT doesn't play much of a part in most Indian government schools and colleges. Most of the work, like taking attendance, teaching in the classroom, and testing, is done by hand.

## THE EDUCATION AND INSTITUTIONAL BENEFITS OF CLOUD COMPUTING

1. Customised learning: Cloud tech gives students more ways to choose how they want to learn. If a student has a device that can connect to the Internet, they can use it to get to a wide range of resources and software tools that fit their learning styles and hobbies.

2. Lower Costs: Cloud-based services can help educational organisations cut costs and speed up the use of new technologies to meet the changing needs of education. Office programmes can be used for free by students, so they don't have to buy, install, and keep these programmes up to date on their computers. It also lets you pay for some apps only when you use them.

3. Accessibility: Users of the education cloud care most about and want services that are always available.This method needs to be available 24 hours a day, seven days a week. Anyone can log in and get to the information from anywhere.

4. No Extra Infrastructure: Colleges and states can now focus on their goals, such as giving students more study tools and making the world a better place, instead of thinking about classrooms, workshops, teachers, etc.

5. Be green: Education cloud will definitely cut down on carbon emissions.

6. Easy to Use: This new building is easy to use, so you don't have to worry about how hard it is. It is simple to understand and simple to use.

## SECURITY ISSUES

In cloud computing, all of our important and crucial data is stored in one place, which makes it easy for hackers to get into. Data protection is an important part of security. Educational institutions might think that their data is safer if it is stored on their own servers. Transferring data to a third party to be stored in a faraway data centre that the institution does not control and whose location may not be known poses a risk. In their contracts, some cloud service companies now say that personal information will only be kept in certain countries. People have said that having a single provider for cloud services is a single point of failure and that it would be better to hire more than one cloud provider to reduce risk. Unsolicited advertising is another security risk. This is when cloud companies send email or ads to people who haven't asked for them.

## CONCLUSION

The cloud lets us view and share our work from anywhere, at any time, and with anyone. It means we don't have to use a certain computer to get to a file or programme like a word processor or spreadsheet. In this study, a cloud education system is described, along with how it helps students, teachers, and educational institutions give better education.

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