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# Cloud Computing For The Academics

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## ABSTRACT

The importance of education cannot be overstated in today's world. In addition to helping to form brains into intellectuals, it also helps to encourage them. A great number of educational institutions are investigating new technologies in order to develop more efficient teaching and learning methodologies. Cloud computing, which is one of the new technologies, has the potential to be extremely helpful in the teaching and learning process. Because the cloud offers a wide range of services, educational institutions are able to give high-quality instruction by using the most up-to-date infrastructure, both in terms of hardware and software. With the goal of bringing about a revolution in the area of education, this article focuses on providing a fundamental introduction to cloud computing as well as discussing the ways in which cloud computing may be used in educational settings to enhance teaching and learning methodologies.

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**Keywords:** Cloud Computing, Academics, Services

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## I. INTRODUCTION

The development of distributed computing over the last 20 years has altered the operation of both commercial and research applications. Thanks to this advancement, a number of more recent uses have emerged. The cloud is the most recent development in distributed computing [1]. Computing in the cloud, in its most basic definition, is saving and retrieving files and applications over the Internet rather than a traditional hard drive [2]. What this means is that cloud computing allows users to share hardware, software, and data via the Internet on a PAYGO (Pay as you go) basis.

Cloud computing has the potential to be a popular choice among educational institutions and universities. By constructing multifunctional computing infrastructure once and then using it for multiple purposes numerous times, it offers IT departments more choice and flexibility. There are many more ways to teach than merely in a traditional classroom setting. Information technology has become an integral part of modern education. The increasing expense to the institution is directly linked to the rapid evolution of IT. Maintaining gear and software that requires constant upgrades is both time-consuming and expensive. This issue has an answer in cloud computing. Depending on the needs of the institution, users may access the platform and applications via the cloud either on-campus or off-campus, or even a mix of the two. Users, such as students and employees, may use its services at any time and from any location at the lowest possible cost.

## II. CLOUD COMPUTING

With cloud computing, you may access your software and hardware over the Internet rather than having it installed on your desktop or on your company's network. This makes the transition much easier and more smooth. As a user, it makes little difference where the software and hardware are physically situated or how they are interconnected; what matters is that they be somewhere in the abstract "cloud" that is the Internet [3].

Instead of using local servers or individual devices to run programs, cloud computing makes use of shared computing resources [4].

The term "cloud computing" refers to a method of storing and retrieving data, programs, and other resources over the Internet in a shared, on-demand manner. A lot of schools currently employ cloud computing. On a daily basis, educators and students alike rely on free or cheap cloud-based services to facilitate learning, social interaction, content production, publication, and collaboration [5].

The following are some prominent instances of cloud computing services: Google Drive, Amazon Cloud Drive, Apple iCloud, Microsoft SkyDrive, Humyo, and ZumoDrive. The three tiers of cloud computing services are as follows:

**A. Software as a Service (SaaS):**

These applications are often created with end users in mind and distributed online. Because SaaS makes apps available on any web-enabled device, at any time, from any location, SaaS is a great fit for students. The usage of software as a service makes it easier to scale the product to accommodate more users or more classes or campuses. Using SaaS as an example, a university may go from serving 50 students to 5,000 in only a few hours, which would be unthinkable in a traditional IT setting.

**B. Platform as a Service (PaaS):**

PaaS stands for "platform as a service," and it refers to a suite of services and tools used by developers to efficiently code and deploy applications. The Platform as a Service (PaaS) model allows academics, including students and professors, to create platform-agnostic cloud apps and services and then make them accessible to a large audience online. Applications may be hosted, tested, deployed, collaborated on, and maintained using its services as well.

**C. Infrastructure as a Service (IaaS):**

In Infrastructure as a Service (IaaS), servers, storage, networks, and operating systems are all powered by a mix of software and hardware. You may get computing power, memory, and storage from these so-called "on demand data centers," and they usually charge by the hour based on how much you use them. Anyone in the academic community, whether students, faculty, or staff, may utilize it to meet their infrastructural requirements.

**III. CURRENT SCENARIO OF EDUCATION**

Always at the heart of the educational system are the numbers, marks, and grades. But in reality, being competitive requires practical knowledge, critical thinking, and practice [6]. Furthermore, in order to stay competitive nowadays, practical knowledge is crucial. Therefore, in order to impart this practical knowledge, the institute has to build a state-of-the-art laboratory, which has the highest initial cost for hardware configuration but will continue to incur costs due to technological obsolescence. Therefore, it is necessary to discover a workable solution, and cloud computing services provide that answer. Any cloud service provider may provide the Institute a pay-as-you-go plan to solve this kind of dilemma. Another consideration is that institutes rely significantly on CMSs; hence, institutes may outsource the storage of their material to a cloud provider, making it accessible to students, faculty, and staff 24/7 from any internet-connected device.

**IV. IMPLEMENTATION OF CLOUD COMPUTING IN EDUCATION SECTOR**

The educational institution is using numerous services of Education cloud to provide high-quality education, as shown in the accompanying diagram.

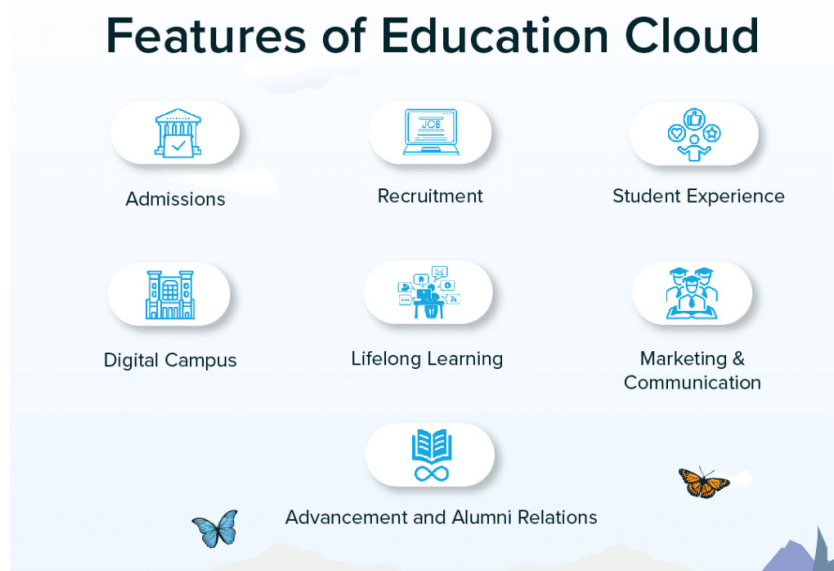
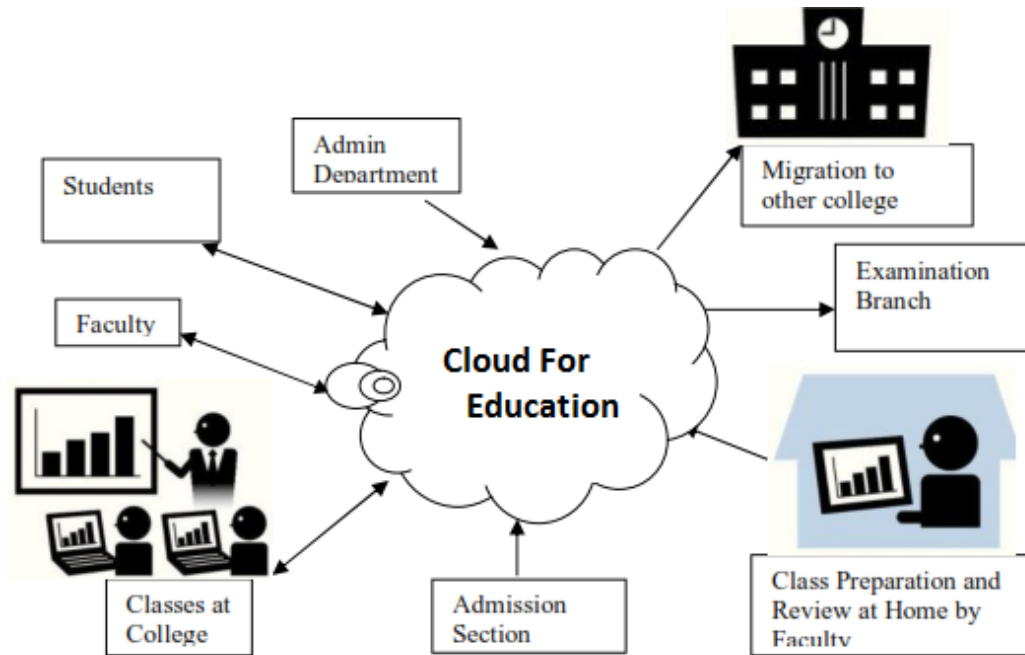


Fig. 1: Education Cloud for Different User (Source: Cloud odyssey)



Services attached to Education Cloud

Fig. 2: Various Services of Education Cloud (Source: Yadav, 2014)

Academics, staff, and students are the target audience for Education cloud. The various cloud services need unique login credentials for each user. When schools use the software as a service model from Education cloud, teachers have access to a plethora of tools, including attendance tracking, online quizzes, and more. Through the use of Education Cloud, PAAS Institute may schedule practical sessions whenever they are required. Example: creating applications for many platforms (mobile, web, etc.). Staff members who have adopted IAAS may use Education Cloud to post course materials and other relevant information, which students can then access at any time, day or night.

#### V. BENEFITS OF CLOUD COMPUTING FOR INSTITUTIONS AND STUDENTS

#### VI.

As a result of advancements in educational cloud computing, lecturers may now do their work directly in their online browsers using apps like Lecture Tools and SlideShare, eliminating the need to store and transport physical hard drives. Some of the advantages it provides include; <sup>[7]</sup>

- Open the files from any device, anywhere
- Forget about buying more software licenses.
- Facilitate the sharing of material
- Avoid software headaches and get things done
- Assist with educational pursuits
- Apps for free or pay as you go
- round-the-clock availability of resources
- Using environmentally friendly technology to save the planet
- Students' exposure to emerging information technology
- The expense of upgrading infrastructure was decreased.

The educational and university sectors stand to benefit much from cloud computing in terms of efficiency, affordability, and accessibility; nevertheless, there are a few caveats to consider, including: <sup>[7]</sup>

- Some applications may not be suitable for running on the cloud.
- Threats to the safety and authenticity of data
- The backing of the organization
- Intellectual property, dissemination politics
- Work practices might be impacted by Internet speed and availability.

## VII. CONCLUSION

In the next years, cloud computing will become more commonplace, and it will provide many benefits to educational institutions, faculty, and students. The dependable services offered by cloud computing to both students and faculty help overcome these limits, allowing for the development of more effective and qualitative methods of instruction. In addition, they may save money on laboratory maintenance by using the cloud services offered by Education Cloud Institute.

The central argument of the article is that the conventional educational system is about to undergo a "revolution" due to the introduction of cloud computing.

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