# Some Cloud Computing Applications in Education

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## Abstract

This paper deals with the concept of cloud computing, its components, characteristics and some of its applications in the field of education. Besides touching on the components and types of cloud computing, the paper shed light on how cloud computing profitably used in learning and teaching. It is also important to pinpoint some changes and difficulties that stand on the way of leaners and teachers when it comes to using various cloud computing services.

***Keywords***:
*Cloud Computing, Google Apps, Hybrid cloud.*

## Introduction

Rapid progress in technologies and services that characterize the current era has dramatically increased sizeable data and information available on the Internet. Files are accumulated inside public and private computers. There is a need for a system that permanently helps users access, edit, and share information. It is a different platform. Cloud computing technologies seem to meet such requirements in terms of providing data on the network permanently, taking into account the factors of participation and privacy, and at the same time taking into account the characteristics of cost for service.

## Cloud Computing

The concept of cloud computing consists of two words: computing and cloud. As it is known, computing is all that is related to the use of computer services, such as programming, management, use, and others. At the same time, the cloud is singular and means cloud: a piece of clouds [1], and the concept refers to the presence of computing near the user. It is available most of the time.

Some definitions of cloud computing can be cited here. For instance, [2] defined it as "a technology that employs the Internet so that it allows the student to support and process data and applications by storing the student's files and data on servers in the form of files that he can access from anywhere and at any time where there is an Internet connection." Likewise, [3] defined it as "a technology that relies on transferring the processing and storage space of the computer to the so-called cloud that is accessed through a network." In a similar vein, Bandar (2013) defined it as "services that are carried out through hardware and software connected to a server network that carries its data in a virtual cloud that ensures its permanent, uninterrupted connection with different devices (computer, tablet, smartphones, etc.) after setting a special code to unlock and lock The network is accessed from anywhere and at any time.

Based on these definitions, we find that cloud computing consists of several systems linked to each other through a system that manages file transfers, provisioning, storage and sharing between users.

## Cloud Computing Components

Cloud computing consists of several main components [2-5]:

1. **User:** A person benefiting from this service.
2. **Platforms:** entities that provide cloud computing services through service providers.
3. **Infrastructure:** The Internet, computers, service providers and operating software.
4. **Applications:** Apps that beneficiaries use to obtain cloud computing services.
5. **Service:** Providing cloud service through a specific software that helps service

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providers in their work.

## Types of cloud computing

The several types of cloud computing are listed below [2, 3, 5]:

- **Public Cloud:** Public cloud computing services enable many users to be publicly accessible and share their resources. An example file upload sites.
- **Collective Cloud:** Cloud services that bring together a certain number of users by sharing their files and cloud services among them exclusively. For example, Google Drive sites.
- **Private Cloud:** a user-specific cloud storage service, the most prominent example of which is email, Google Drive, Dropbox, and others.
- **Hybrid Cloud:** a cloud storage service that combines several types of cloud computing into one service, such as Google Drive.

## Importance of cloud computing

The following points illustrates the importance of cloud computing [2, 3, 5]:
- Keeping files by uploading them to permanent and reliable cloud services so that they can't be lost.
- Remote access to computer files.
- Access to computer files from different platforms.
- Availability of cooperation services between users.
- Users sharing files.
- Providing necessary flexibility among the work teams by providing files immediately and permanently.

## Cloud Computing Features

Among the most essential features of cloud computing are the following [2, 3, 5]:

- Self-service on demand: providing the service to the user when needed.
- Multi-platform support: by providing communication protocols between different devices and systems.
- Permanent availability: making files stored in a way that allows the user to access them permanently.
- Sharing services: providing the feature of sharing files with other users.
- Privacy and confidentiality of information: basic characteristics provided in cloud storage sites.
- Flexibility in providing support services: by providing auxiliary services such as photo editing programs and reading documents.
- expense savings.

## Cloud Services Uses

In order for cloud services to be used, the following must be available [3, 5]:

1. **User's device** a computer or a mobile device.
2. **Operating system**: that allows access to the Internet.
3. **Middleware**: helps communicate with the service provider's website: such as the Internet browser or cloud computing applications.
4. **Availability** of web service.
5. **Cloud service provider**: obtaining an account in this service.

## Cloud Service Providers

Cloud services are provided through the private websites of the institutions or through the famous commercial and service websites that provide this service [3, 5], the prominent ones are the following:

- Google Drive
- Dropbox
- OneDrive
- Amazon Cloud Drive

## Cloud Services Apps in Education

Several studies indicated an increase in recent trends in taking advantage of the services provided by cloud computing that support learning and increase the effectiveness of educational services offered by many educational institutions [2]. Many software based on cloud computing services provide many services to the educational sectors and have been satisfied by many educational institutions, the most important of which are:

Google Cloud Services (Google Apps): cloud computing services that provide many cloud services that can be used and activated in educational aspects. The most important of those services are:

- Cloud file storage.
- Sharing files among students and teachers.
- Google Docs Editor: This helps in viewing, sharing and editing documents collectively among students or individually.
- Electronic spreadsheet services.

- Presentation services.
- Building educational blogs services.
- Data collection services and electronic questionnaires.
- Email services.

OneDrive services provided by Microsoft, similar to the services provided by Google.
These applications (among others) based on cloud computing technology are advantageous for students, teachers, and all those working in the educational field and represent a qualitative shift from traditional e-learning to faster, broader and easier-to-access e-learning in the shadow of cloud computing.

## Cloud Computing Challenges/Difficulties

Despite the great services the computer services provide, many challenges may emerge and need to be addressed to ensure the provision of appropriate computer services, and the most important of those difficulties [2, 3, 5]:

- **Privacy and data confidentiality:** This is a problem facing everyone on the Internet. It requires many government and company efforts and raising awareness among individuals.

- **Reliability:** It means whether the service can be available permanently and how to deal with interruptions due to natural, technical, and other causes.

- **Compatibility:** It means whether cloud service systems are compatible with different platforms and operating systems and how to help achieve this.

- **Control:** It means that the computer services are at the disposal of the companies providing the service. In the event of a change in the political or economic situation of the company, what guarantees the user will continue to store data and keep the accumulated experiences from using this service.

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