

Application Of Cloud Computing In The Field Of Education: Google Apps As An Example

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Abstract: Information technologies that have entered almost every area of our lives have an important role to play both in our daily work and in the realization of our business and educational activities. Cloud Computing as one of the innovative technologies we frequently heard about recently, is creating innovative services in the information technology industry. With the popular terminology known as infrastructure as a services (IAAS), platform as a services (PAAS) and software as a services (SAAS), compounding the operation of various applications and services on an internet server called cloud technology, and running these applications and services can be done with any device connected to the internet. As these services can be rented by the users on the basis of use (Pay as you use). Due to the advantages and importance of cloud computing, the use of this technology is increasing rapidly. Cloud technology that aims to respond to users' expectations and to the desired extent. It offers different alternatives in rapidly growing areas such as communication, communication and education. In this study, it has been analyzed how this technology can be used in education which supports different educational activities such as mobile learning, cooperative learning and active learning. Therefore, the integration of cloud technology and its applications into the education sector has been examined with the use of Google Apps that is free and easy to use.

Keywords: Cloud Computing, Educational Technology, Google Applications in Education

The world is witnessing every year a great and deep-rooted developments in the field of technology. From the first computer generation with limited functionality, to the line that extends towards high computing power with portable computers. The development of the Internet has also opened a new dimension in the field of computer and communication. The data stored at fixed points has been made available to the Internet with a wide range of users. Nowadays, usage rate is increasing rapidly and cloud computing is internet based technology. It is a distribution and information processing model that provides access to services and applications in service provider infrastructures based on internet and on demand. Unlike traditional information technology systems, cloud computing enables the transaction source and applications to be accessed as a platform-independent service in a dynamically scalable infrastructure. With the innovative and dynamic opportunities it offers the popularity of easy to use cloud computing as it is rapidly increasing and IT infrastructures are rapidly turning to cloud computing. The effects of this radical and rapid technological developments on the social and institutional structures in the age of information century are felt in almost all areas, including education systems. Taking into account establishment and management of a flexible IT infrastructure that will meet the expectations in every condition, creates an undesirable burden on the educational institution. And as a result, the educational institution cannot reach the expected quality. For this reason, educational institutions have entered new searches to manage their resources effectively Bala Kamalakaran (2014). In this context the implementation of cloud computing architecture infrastructure burden on the educational institutions is fully assumed by the service providers. Due to the dynamic scalability of cloud computing, the infrastructure is automatically dimensioned depending on the increase or decrease in service usage, and the expectations can be met without any bottlenecks. In this way, service disruptions can be prevented and the majority of the infrastructure is prevented from being in an idle state when expectations are decreasing (Sultan, 2010), Ercan, T. (2010). Therefore,

technology-oriented innovations in the social, cultural, political and economic fields affect the education sector and create systemic transformations. Nowadays, the technological tools that are still stable have gradually expanded the field of use and have begun to get rid of being constant Armbrust, M. et al., (2009). For individuals, the need to access information in an independent and on-the-go basis is increasing. As a result, individuals can work with different devices in different places. In this way, data access, data transfer, data sharing and data processing processes are made quickly and easily, independent of time and place. Therefore, Cloud Technology is one of the innovative technologies that support these processes and enable us to take maximum advantage.

Materials and Methods

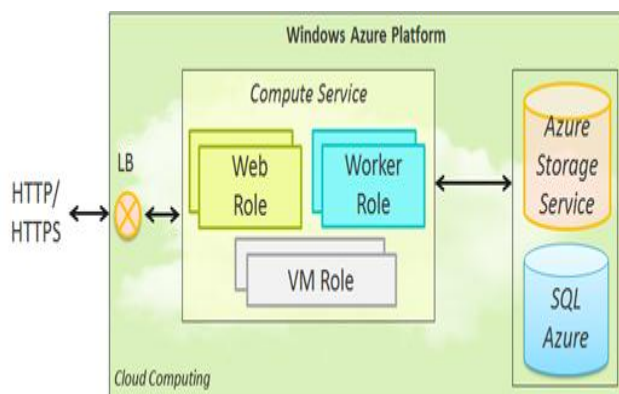
First: Cloud Computing Model

Cloud computing is based on the hosting service and distributed computing logic. Applications and data are stored on large data centers; the processing power required by the applications is provided by systems distributed over more than one computer. While the cloud computing model does not contain any unusual logic, unlike conventional systems, the infrastructure and applications are in large geographical data centers at certain geographic locations; it is provided to the users as a service according to their demands and use. Users use the resources on demand in certain periods, and are charged as much as they use and can terminate the service usage at any time Armbrust M. et al., (2009). The idea of cloud computing since the first days of the Internet has become more prominent in the last few years. Cloud computing provides many services such as computers, applications accessed via the Internet, databases, file servers and e-mail service, and in this way aims to reduce the burden on personal computers Al-Asmari, & Rabb Khan, (2014).

Cloud computing system basically has the following characteristics:

- Continuously growing infrastructure: Cloud computing provides users with ever-increasing processing power and storage. Users do not need to make capacity storage space and transaction infrastructure planning.
- Dynamic scaling on demand: All cloud computing platforms offer the ability to expand existing infrastructure and add new services depending on the demand of users. A new application or a new server can be added to the existing system very quickly and ready for use, when the usage rate decreases, the unused resources are removed from the system and savings are provided.
- Low cost and usage-based pricing: Cloud computing does not require pre-investment or large installation costs. Hardware and software received as a service from the service provider and it is paid based on the amount of usage.
- Service-level agreement: Cloud computing providers offer service-level agreements that guarantee continuity and security of their service. R. Lakshminarayanan, et al., (2014). In the event of disruption of the activities of the cloud computing platform due to any reason, the service provider guarantees to repay the customers and to cover their losses.
- Data centers are located in different geographies areas: Data centers of cloud computing service providers are located in different geographies around the world. In this way, users can host their applications and data in their geographies close to them or their target groups. In addition, the data of cloud service users are backed up by data providers in different geographic locations to reduce data loss risks. A. Ghazizadeh, (2012)

Windows Azure is a cloud computing service platform built on Microsoft data centers. It has a complex and multilayered structure which is formed by the combination of various equipment and applications (Figure 1). Ercan, T. (2010)



Source:

<https://blogs.technet.microsoft.com/yungchow/2011/05/09/cloud-computing-in-paas-with-windows-azure-connect-part-22/>

Figure 1. Layers of the Windows Azure platform

The hardware creates the lowest layer on the Windows Azure platform. Servers include physical components, such as uninterruptible power supplies, generators, storage and backup units. The hardware infrastructure of Microsoft data centers is constantly being expanded, and nearly 10,000 new servers are added to the infrastructure each month. Krishnan, S. (2010). Servers in Windows Azure data centers are divided into multiple virtual machines using virtualization technology, thereby increasing the overall server efficiency. In order to allocate resources to virtual machines and to provide isolation between virtual machines running on the same physical hardware, a low-level system software called hypervisor is used. On the Windows Azure platform, there is an application software called a building controller that is deployed on all machines. The building inspector ensures that all equipment included in the infrastructure is continuously monitored, managed and coordinated. Microsoft data centers, which are formed by the combination of millions of servers and additional hardware, serve in close to one hundred points in different geographies. The service continuity of Microsoft data centers, which are physically and logically equipped with high-level security systems, and the data security of users are guaranteed by national and international agreements. Microsoft (2011)

SQL Azure Cloud Database Service

SQL Azure is a relational cloud database service built on Microsoft SQL Server technology operating in Microsoft data centers. SQL Azure allows you to create databases based on a web interface, easily and without the need for any application installation or configuration. Unlike other storage services, SQL Azure introduces a database logic to storage. It adds speed and flexibility to the application development process by supporting the technologies, tools and data models that developers are already familiar with, Krishnan, S. (2010).

Third: Data security and privacy

In cloud computing, data is shared and stored in a shared environment. Given the general cloud architecture, the service provider must not be able to see and change each other's data. In the same way, it may be necessary for the service provider to not see user data and change its contents, while users cannot change the contents of the cloud infrastructure. At this point, the data must be successfully isolated. There are many ways to ensure data integrity. For example, user data access and encryption can be granted, management is given to the service provider and at the same time user management is encrypted, thus reducing the security concerns of data circulating through the cloud. Nidal Hassan Hussein & Ahmed Khalid (2016) An important point in data security is that data transmission is secure. Data provided by the user or data provided by the service provider must be transmitted with a secure transport channel. In addition, in order to achieve high access, care must be taken to ensure that the data does not leak and transfer securely while the service provider transfers data to another point in the world, R. Lakshminarayanan, et al., (2014). This does not require cloud users to install cumbersome programs for viruses, since it is the service of the service provider to help prevent such viral attacks. Thus, the service provider tries to prevent attacks in the cloud to protect against malicious software, hacker attacks and system gaps, if any.

Fourth: Cloud Computing Background in Education

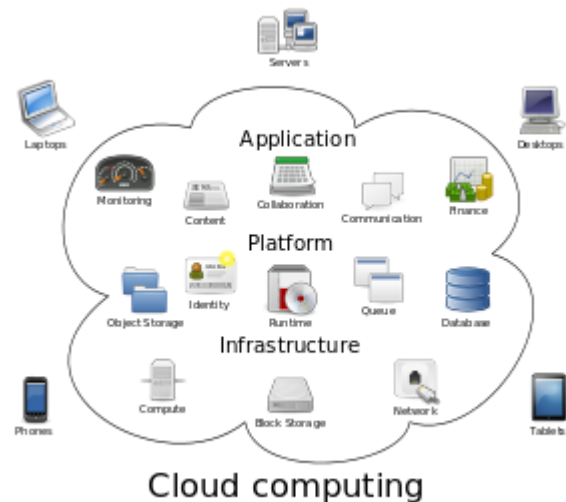
Cloud-based learning applications are a new and flexible solution for accessing data and services, enabling information and experiences to be shared effectively across the web and collaborating on projects. Unlike the traditional model, Cloud computing resources are part of a more social infrastructure. Cloud-based learning applications transfer the infrastructure installation, maintenance and management processes that are burdened by educational institutions to the control by cloud service providers, it enables them to move towards a higher quality education which is the main focus of educational institutions. Solutions and benefits of cloud-based learning applications can be listed as follows, Microsoft (2011):

- It enables students to perform educational activities without limitation of time and place, to access library content and online resources electronically.
- The students ensures that their performance and interrogation, grading are recorded electronically and according to the desired criteria.
- Students are provided with regular feedback and progress.
- Online communities can be created where students, educators and administrators can collaborate.
- Prepares the ground for sharing ideas and experiences between educators and administrators.
- Ensures that students and institution employees can access electronic resources independently from time and platform.
- Web-based courses and class records can be made.
- Provides a good environment for students to connect with educators and administrators.
- It allows to design and present daily or short-term or long-term plans on the web.

Cloud Technology

During the sixtieth of the previous century, John McCarthy introduced the cloud computing model, the idea is that calculations will take place over large public networks in the future Buyya, R. et al (2009). The term cloud computing, was initially used to refer to networks in information and communication systems. The cloud symbol was used to symbolize the Internet until 1994 Mladen A. Vouk (2008). In 2007, Google, IBM and many universities worked on cloud computing on research projects, and in 2008 users of IT services; service providers witnessed such results. Therefore, it can be said that cloud computing concept emerged as a result of the companies' hardware and software, and to a certain number of models, that formed the services, C. Bulla, & S. Mehta (2016) The idea of cloud computing since the first days of the Internet has become more prominent in the last few years. Cloud computing provides many services such as computers applications accessed via the Internet, databases, file servers and e-mail service, and in this way aims to reduce the burden on personal computers, A. Naik, et al., (2013). This technology is a new model where big technology companies such as Microsoft, Google and IBM accelerate with their investments in the process of being used at the time and place required by making IT services accessible to the internet, Sultan (2010). Cloud Technology, which is defined as the operation of various applications and services on a server in the internet and running these

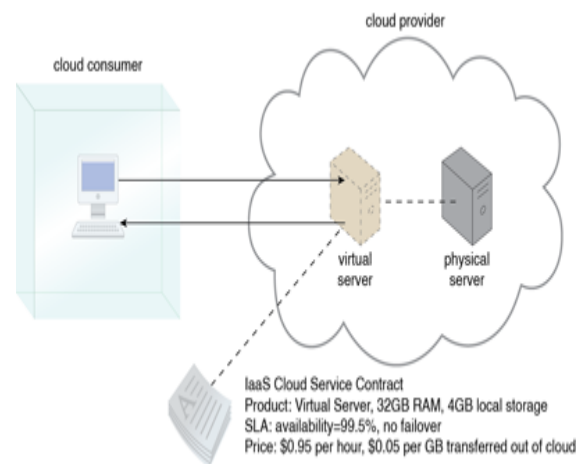
applications and services with any device connected to the internet, can be scaled according to the needs on common resources, ready to use, ready to use resources and easy to manage. It can also be expressed, as a cloud technology, with resources, software and data can be accessed and shared by other devices via computer and computer-based devices at the request of the user, as it is an internet-based structure Ercan, T. (2010). Cloud technology offers flexible and diverse services that can be used in accordance with the wishes and needs of the user rather than a strict and standard structure. These services, which are within the scope of cloud technology, consist of three structure terms in general, these are: Buyya, R. et al (2009).



Source:

https://simple.wikipedia.org/wiki/Cloud_computing

Infrastructure as a Service - IaaS



http://whatiscloud.com/cloud_delivery_models/infrastructure_as_a_service

It is used in the infrastructure of cloud technology to express the services in the lowest layer, Sultan (2010). In the infrastructure service model, organizations need their tools such as storage device, computer network and server from the companies that provide cloud services as services, in other words, virtual hardware is offered to the user Cloud computing services (2017). For example, data center resources such as processors and storage are provided in a scalable way to serve users and infrastructure needs are provided as a service. In the model of providing the

infrastructure as a cloud service, the user can configure the processor, storage, network resource and other basic IT resources and can install the operating system and applications on them. Although the user does not have full control over the infrastructure, but has complete command of the system at the operating system level and can manage some network components (firewall, network mapping, etc.) Nasir, U., & Niazi, M. (2011).

Platform as a Service - PaaS

PaaS = Platform as a Service



<https://www.360logica.com/blog/some-of-the-key-benefits-of-platform-as-a-service-paas-cloud-computing-model/>

The service provider, provides the user with an environment in which they can develop and run their own application, as well as a platform including complementary services and the necessary technological infrastructure. Apart from the application established by the user himself, there is no control and management possibility on the components of the platform infrastructure, Bala Kamalaxharan (2014). This service can be considered as renting hardware, operating system, storage unit and network capacity over the internet, Katz et al. (2009). For example, services such as the Google Apps Engine, Microsoft Windows Azure, and the people or organizations that want to develop their applications are required to develop and test their applications in the form of cloud informatics.

Software as a service - SaaS



<https://hackernoon.com/saas-software-as-a-service-platform-architecture-757a432270f5>

In this service model where users can work by accessing applications on the cloud from any location connected to the internet without any installation to their systems in order to access the applications; The service provider's software runs on the cloud infrastructure. Applications can be accessed from various user devices (desktop, laptop, tablet, mobile phone, etc.) without time and location restrictions via interfaces such as web browsers via internet connection,

Sunita Manro, et al., (2011). Users do not manage or control components such as network, server, operating system, and storage devices in the infrastructure. Only user-specific application settings can be made Bouyer, A., et al., (2013). It is a model where a simple e-mail service is available as a service with up-to-date versions of all software, which may include accounting, finance and office applications, and which are needed for the web-based enterprise or end-user. With this technology, the software needed by the institutions are kept on the servers of this service provider, and the software is provided to be run from these servers without installing the software on its own computer, Katz et al (2009). For example, a text document written with Microsoft Office can be previewed and edited via the Internet in a location where this software is not installed. With cloud computing that offers new solutions to the problems encountered in the public or private sector, it is expected that all institutions will change their business production processes. In this line, less cost, less qualified IT personnel, more flexible and less complex structure is provided with better quality service Katz et al (2009). For example, businesses can continuously invest in new infrastructure, provide in-service staff training or get new software licenses, eliminating the necessity to quickly access information sources, A. Ghazizadeh, (2012). The concept of Cloud Technology is seen as an area where big technology companies make serious investments in order to get their share from this market in line with the demands of today's increasing mobility, due to the availability and cost advantages offered by it, Buyya, et al., (2011). According to Kiran Yadav (2014). cloud technology; Due to the opportunities it offers, it is an innovative technology to meet the growing needs in such areas as education communication. One of the advantages of cloud technology to the user is that there is no need for the user to deal with any hardware and software installation Bala Kamalaxharan (2014). With this technology, even low-performance computers can be sufficient to run web-based applications. Since the application is running in the cloud, most of the operations that can be performed with a minimum resource usage, a powerful computer (database applications, application development studies, etc.) can be done. Therefore, the use of cloud technology and computer-derived technological tools, low-capacity hard disk, memory and processor, does not cause performance loss; On the contrary, low hardware provides the user with an advantage of reducing the cost, Ercan, T. (2010). In addition, since data can be stored on the cloud, some data can be backed up to prevent data loss due to a technical failure in the personal computer. The availability of cloud technology makes it more attractive to access these data at any time and at any place, where internet access can be provided. For example, Google Drive application from your computer and derivative technological tools, the user can either store the current version of his files on the virtual drive in the cloud or pull them out of the virtual drive, Google Apps for Education (2018). In addition to this, due to the changes in the amount of cloud technology, the use of IT infrastructures and the amount of load falling on them, the resources are distributed in proportion to the need and the number of users, which provides a profitable solution in terms of cost and labor. This situation, which allows the resources to be used effectively and efficiently, is referred to as the concept of scalability Bouyer, A., et al., (2013). One of the most important

advantages of cloud technology is that more than one person can edit simultaneously on the same document. For example, Google Docs application, multiple people can work on the same file (.doc, .xls, .ppt extension) at the same time. In addition, because the files are stored in the cloud instead of personal computers, users can access the most current version of the document at any time with any computer or mobile device having internet connection. With the correction history feature, changes to each document can be tracked, Google Apps for Education (2018). The problems of opening a document created by cloud technology on other computers are eliminated. For example, normally there are different versions of the same software application, in this case there is a need for extra software installation or conversion programs to enable a document created in Microsoft Office 2007, or 2013 to be opened in Microsoft Office 2003, Microsoft (2011). However, on cloud technology, these processes can be performed quickly and easily without any installation or conversion. One of the cloud technology applications called Zoho creator and currently has more than 10 million users, offers web-based services for small and medium-sized businesses. In these services, chats, documents, discussions, mail, meetings and collaborative applications can be realized; business applications including customer relations such as site, marketplace, order tracking programs; calendar, document creation, report creation (tables, graphics, etc.) provides the application of the sections. On the Zoho platform, users can create online documents and presentations, edit and combine the files they create, add tasks, add them to the calendar application (business calendar), and store them on Zoho's storage services. Customers use Zoho applications to manage their own information and work more efficiently without any prior coding experience or IT expertise, and without worrying about old hardware or software and their cost, with Zoho it is easy while in the office or on the go Zoho (2019). Another cloud technology application, is called "Open Cirrus Cloud", is an application that is used by HP, Intel, and Yahoo companies and is a cloud technology based software platform test. This platform test enables companies to test new software and ensure the control of total quality management.

<https://www.cs.cmu.edu/~droh/papers/opencirrus-ieeecomputer.pdf>

Fifth: The contribution of cloud computing applications in education

Applications based on cloud computing are a new and flexible solution to access data and services, enabling the effective sharing of information and experiences across the web and project collaboration. Unlike the traditional model, cloud computing is part of a social infrastructure, Li and Chen, (2011). Applications based on cloud computing invest in infrastructure operations, with the maintenance, management, modernization, hiring and training of operators, rather than by educational institutions as they are controlled by cloud providers. This in turn enables educational institutions to progress towards higher quality education through the provision of infrastructure expenditures, a key focus of educational institutions.

The solutions and benefits of the applications based on cloud computing can be listed as follows, Microsoft (2011):

- Enables students to conduct educational activities without specifying time and place, to access content and Internet resources electronically.
- Students ensure their performance, and grades are recorded electronically according to required standards.
- Students are provided feedback with different reactions and progress.
- Virtual communities can be created online where students, teachers and officials can collaborate within these communities.
- Serve as a background for the exchange of ideas and experiences between teachers and administrators.
- Ensure that students and staff of the institution have access to electronic resources independently in terms of time and place.
- All lectures, records, and various files can be recorded on the Internet.
- Provides a good environment for students to communicate and interact with teachers and administrators.
- Allows the design and delivery of daily, short-term or long-term plans on the Internet

The need for education

In line with the needs of society in the era of information technology, educating individuals is one of the aims of education and it is necessary to direct the education through the use of technology in education, according to the characteristics of information societies Nidal Hussein and Ahmed Khalid (2016). It has been noted that the developments in the technological field, especially in the 2000s, was rapidly entered the education sector and offered innovative applications to the existing teaching and learning strategies and methods. Considering the learning needs of the society for information in the Twenty first century, rapid access to information, learning at any time, and anywhere can be said to be important. Learning needs at all times revealed the mobile learning model. Emerging with mobile technology, this new learning model of education by bringing a new dimension and potential needs instantly when facilitating access to information space as independent and moving from education and innovative strategies to a curriculum that combines methods and learning methods, Al-Asmari, Rabb Khan, (2014). On the other hand, from the above mentioned educational advantages, it is thought that mobile technologies cannot be utilized sufficiently because of the problems encountered in infrastructure services issues such as data sharing, software sharing. At this point, with the use of minimum resources, regardless of time and place storage, communication, planning and so on, cloud technology provides effective solutions to solve mobile learning problems and makes mobile learning more efficient and effective. In fact, Cloud Technology dose not only offers solutions for mobile learning, but also offers effective and alternative solutions to all areas of education with the services it offers. Nowadays, with the rapid development of technology, hardware and software infrastructure of the technologies used in education as well as in many fields is no longer valid and it becomes necessary to acquire new

hardware and software. In the same way as other fields in education, ensuring the rapid development of the technological infrastructure requires making large investments in this field. In addition, traditional technological infrastructures in the education sector have difficulties in terms of cost and workload. For this reason, instead of organizing internal infrastructures in the education sector, choosing dynamic, scalable, flexible cloud computing infrastructures will provide an advantage in terms of time and budget. And it is possible to have access to information resources rapidly by eliminating the necessity of continuously investing in new infrastructure or getting licenses for new software in education. Nasir, U., & Niazi, M. (2011). Recently due to the increasing popularity of cloud technology, studies has been gradually increasing in the field of education. For example; According to a study conducted at North Carolina State University, the Virtual Computing Laboratory (VCL) whose foundations were laid in 2004 and equipped with open source code in 2008, with an application for educational activities, and infrastructure to access the powerful computing services to the undeveloped educational institutions as enough as it should be, as It allow student's computer to be used over a common infrastructure without the possibility of installing a separate application, Averitt et al., (2007), Students can access the application via web browsers at www.vcl.ncsu.edu, without the need for extra equipment in educational institutions, as the existing technology infrastructure and the performance-requiring applications can run, but not sufficiently developed. Therefore through this site programs can be run through a common infrastructure without the individual installation of each student's computer. In a study on the cloud e-learning platform called Blue Sky in China. In this platform physical machines are allocated to client e-learning systems. This platform offers reliable, scalable, low-cost e-learning environments in a simple way. The main purpose of the platform is to provide a wide range of education services in China in parallel with the traditional education, this platform also provides information sharing and collaboration among employees in the e-environment, Dong, B., et al., (2009). While sharing the advantages of cloud technology, information sharing also contributes to cooperative learning. Because cloud technology, working groups, and a common platform, provides the opportunity to work in collaboration on specific projects. Group members can work on the same task simultaneously, exchange ideas and information with each other, and evaluate the data obtained as a result of the work jointly. In a collaborative learning approach. Students can help each other learn in an academic subject for a common purpose by creating small mixed groups in each class and other environments, thus increasing self-confidence for individuals, developing communication skills, and participating more effectively in the learning process. Educational environments designed with cloud technology are believed to support collaborative learning, active learning and individual learning processes, Sultan, (2010). Different companies in the use of cloud technology offer opportunities in the field of education. Microsoft's new generation of cloud solutions for Education called Microsoft Office 365 has replaced Microsoft Live @ edu by the end of June 2012. A highly useful solution for academic institutions that are ready to take advantage of the cloud, Microsoft Office 365 offers free email, instant messaging, group video, voice chat and online document viewing and editing support. Students and

teachers can work in real-time on assignments and group projects, and can easily share information, view and edit documents in a browser without any additional programs, Microsoft Office 365 (2019). https://en.wikipedia.org/wiki/Office_365. Similarly, the free Google Apps "The Education Edition" is available as an integrated communication and collaboration solution to educational institutions. With Google Apps, which includes many applications, such as email, calendar, chat, site creation, and other google apps features, as students can organize their programs and share their events and calendars with friends. They can collaborate in real time with project teams or the school by sharing documents, spreadsheets and presentations Google Apps for Education (2018).

Sixth: Google educational applications; as an example

While Google Apps includes many applications, Gmail, Calendar, Google Drive, Google Docs, Google Spreadsheets, Google Slides, Google Sites, and Google Translate are among the most commonly used apps in education, Google Apps for Education (2018). Here are brief descriptions of these applications:

Gmail; It is an application that works on any computer or mobile device with a data connection and allows offline support to continue working even when there is no internet connection. This app, which is not only used as a mailbox, has the ability to view text chat, voice and video chat (Google Talk), online users can view documents shared by other users.

Calendar Sharing; It helps users working together to set time and recommends meeting times appropriate to everyone with intelligent planning.

Google Drive; The virtual drive, which can be accessed from computers and derivative devices, provides a single place for the current versions of the files. Google Docs are also stored in Google Drive. And the user can access his documents at any time and place. In addition, files and folders can be shared with other users and can be commented on.

Google Docs; files, tables, equations, drawings, links can be added and more and more can be created with rich documents. In addition, input can be collected with social comments and feedback can be used.

Google Spreadsheets; is a powerful table organizer. Lists with this app can be stored and shared. Similarly, projects can be monitored, data can be analyzed and results can be tracked.

Google Slides; embedded presentations, animations and dynamic slide transitions. Similarly, there are possibilities to share presentations and to allow others to view.

Google Sites; It is an application that makes it possible to create project sites without writing a single line of code. The site is open to specific people and hiding features are available.

Google Translate; translations can be made using different language alternatives, they can be stored and shared.

Google Classroom Application, Google Classroom is a learning management system where the teacher can publish the specific course announcements and assignments, and students can also send assignments through Google Classroom. You can access: classroom.google.com

Google Keep, a great way to keep track of task lists, ideas, and more, and share your notes with others. This app on Android can give you your feedback anytime, anywhere. Accessed by keep.google.com

Google Plus, Google Plus is a social network developed by Google in 2011 that shares views, posters, videos, and many more, and can create pages for specific groups that can be used in the learning process, accessible: plus.google.com.

The Google Hangouts app, a unified communications service that allows members to start and participate in text, voice, or video conversations, from person to person or within a group. They are located within Google Plus, in Gmail, and in mobile apps for iOS and Android devices.

Google Blogger or Blog, a free publishing platform run by Google. It's designed to be easy to use so you can upload content to your blog via email, Google Plus, and many other apps and programs.

Google Forms Application, Google Forms is a tool that allows users to gather information from a custom survey or test. The information is then automatically collected and connected to a spreadsheet. The spreadsheet is filled with survey responses and quizzes. It can be accessed: docs.google.com/forms

Google Apps, which includes many more applications, is a cloud solution that can be used in educational courses. For example; in a project assignment in which students of the same or different classes in the Teaching Method course can be grouped together; Students can organize their work in collaboration with Google Apps, through google calendar, they can organize a day and time that suits everyone. While communicating with each other through the Google Talk application, and all students in the group at the same time on the same document can make edits and corrections. Through Google a document or file can be translated in Google Translate application to different languages. In addition to that the work can be stored with the Google Drive application and can be accessed from home, mobile or school environment. While on a Google Site the teacher can make assignment, prepare questions, comments on the forums and do all job that students have accomplished. After that, on the other hand students can comments and even create an interactive environment, providing cooperative and active learning for all project members. Many educational institutions uses Google Apps as a platform for their education, such as Monash University – Australia, Brown University - USA , Benin University - Nigeria, Vanderbilt University – USA, and many other institutions, such as the Oakwood Junior School - UK, Saline Area School - USA, and the Oregon Department of Education – USA, New York Middle School – USA, use the Google Apps for Education Google Apps for Education (2018) One of these organizations, New York Middle School, stated that they provided an active learning environment with Google Apps,

which enabled more student participation at a lower cost, and that mathematics performance increased significantly with active participation, Google Apps for Education (2018). In order to alleviate the low level of mathematics achievement in New York Middle School, a School Communication Technologies team was established to increase students' motivation and contribute to their critical thinking skills through cooperative learning processes. This team first started using the Gmail app, which includes services such as text chat, voice and video chat. After discovering the Google Docs service, which draws attention with its multi-use and simultaneous editing facilities, it has started to use this application due to its contribution to student's cooperation. The process, which started with the use of this team by the applications, soon attracted the attention of other educators, some educators found the application very useful and started to use it, Google Spreadsheets, Google Slides and so on. On the other hand, some educators have been cautious in the use of this innovative technological practice. These educators were obliged to use this practice once in the framework of an activity carried out in the school and it was observed that they continued to use it after. This can be expressed as determining the potential educational benefits of this technology and being functionally effective in meeting learning outcomes and expectations. Educators have also begun to use the application for the purpose of interdisciplinary communication and interaction, and have found that the sharing of notes, lesson plans, meeting hours and other updates is of great benefit. Educators provided students with projects using Google Docs and provided online controls and feedback instead of manual paper corrections. They also encouraged students to help and give feedback to each other. Students have access to their own personal accounts, access to e-mail, documents and blogs, and also have the opportunity to follow the lessons even outside the school hours. The use of Google Apps continued with a rapid acceleration, teachers prepared exams using Google forms, conferences and so on. These initiatives continued with such practices. Google blogs are also being used to make the individual projects of the students more efficient by getting the <http://cis339online.org> domain for the school. In a short period of time, this technology, which teachers, students, secretaries and advisors have begun to use, improves communication among all school members that uses Google Docs and Spreadsheets in curriculum planning, collecting and analyzing data, sharing students' achievement, and teacher make feedback processes which make it easy. With Google Apps, which has the proper use to attract and teach students, all teachers have prepared documents for their own lessons, increasing the students' attendance and learning. In addition, encouraging students to comment on each other's documents and make suggestions, therefore enabling peer review. Now, in this study, where teachers provide feedback to students' documents, by editing and adding explanations, teachers are trying to prepare different educational activities to integrate Google Apps applications into education to support learning. In addition, in the New York Middle School, Google tools are not only used for teaching and learning, but also for promoting behavior. For example, when students perform correct behaviors, they earn points and these points are processed on a common document. The other students who see these scores are motivated to exhibit these behaviors. This way, documents are used to show that some students do not have

the correct actions. Google tools provide an objective and transparent feedback mechanism where teachers and students can see the same pages. As a result of the use of this technology, the mathematics achievement at school has increased from 22% to 47%. In addition, positive developments in students' behaviors, increase in class participation rates, and disciplinary penalties have decreased. <https://www.nyssba.org> As Google Apps for Education is a free application hosted by communication and collaboration applications designed for schools and universities, it contributed to the school budget, as it does not have expenses such as technological infrastructure renewal, stationery, printouts and photocopying costs. It can be said that Google tools have great potential in terms of educational activities, along with teaching, learning, social sharing, professional development, keeping records and more, (Google Apps for Education (2018) "Don't Worry, Be Scrappy: Good, Cheap Tech for Schools, Cloud Computing and More;" By Jeffrey Hastings; School Library Journal, March 1, 2009

Results

In the era of the information society in the 21st century, ICTs are of great importance in line with the needs of individuals. And therefore economies geared to these technologies and jobs are formed and allocated in many sectors which are carried out easily and efficiently in line with these technologies. From this perspective, it is possible to provide better and faster service to members of the information society by using these technologies at the highest level in public institutions, Li G., Chen G. (2011), Liao, W., Ho, R. (2011). Cloud technology, is considered as one of the innovative technologies; Due to the opportunities and the advantages it offers, it is gaining importance in terms of being a technology and its growing rapidly like communication, educational interaction, and meeting the increasing needs in these fields. This study provides an overview of cloud technology and its integration into education through Google Apps. This integration brings a new approach to the use of educational technologies and offers a new option for academic development and an innovative education model that supports individual learning. Nowadays, the importance of reaching information independently of time and place, led to the increasing importance of individuals to access mobile data, data transfer, data sharing and data processing, as it can be performed quickly and easily. Cloud computing supports these processes and allows us to take maximum advantage, and the way to access various IT applications and services with any device connected to the internet in an easy way to be used. Some studies Alabbadi, M.M. (2011) Ercan, T. (2010) Sultan (2010), pointed out to the importance of education in every age, and that technology-based applications in education have gradually increased. It has become necessity to use the cloud information infrastructure in education to improve the quality of learning and meet learning outcomes. This infrastructure creates a significant reduction in budget expenditures and the workload required for procurement of hardware, software and technical facilities, especially for educational institutions. Because of this technique, low performance computers allow you to run different applications. With the development of cloud technology, it is possible to use different services (such as infrastructure, platform, software) effectively and efficiently.

In addition, since data is stored on many servers, data loss is greatly reduced and data transmission problems are eliminated, with many data accessible instantly (Internet, mobile phone, tablet, etc.). It was also pointed out, that cloud computing will have an important position in the education sector both in terms of mobile feature and in supporting learning processes, and thus the interaction between educators and learners are at high level, the availability of applications and their integration into education are discussed. It was also stated in the study that cloud technology tools can present a new instructional paradigm to classical teaching methods. Cloud Technology shows its existence in academic teaching and learning processes in the first steps. The basic characteristic of cloud technology is to allow learners to evaluate a learning process and to allow them to experience different learning experiences on an independent time and place. Nowadays, where access to information resources is very important, it is possible to learn more easily with the help of cloud technology, which enables students to make arrangements on the same document simultaneously and which provides important advantages in terms of both access and sharing. In fact, it combines many of its many applications that make cloud technology different from many other technologies. When examined in detail, these applications are identified as user-friendly applications that enable the creation of a digital work environment and the ability to store the documents that can be easily shared from the desired time and place. Therefore, it is thought that it is important for educators to try cloud technology applications, to create innovative teaching strategies and materials and to benefit from this technology in educational activities.

Conclusion and Recommendations

In line with the rapid changes and developments in technology, expectations in the field of education, and individual expectations in a timely and adequate manner, educational institutions has continuously improve their IT infrastructure. Creating a flexible infrastructure that can respond to all expectations in a timely manner that in return puts down a burden on labor and budget. As educational institutions are not able to focus entirely on the education process and the concerns about the technological infrastructure due to its expenditure. Furthermore, the use of the IT infrastructure of an educational institution shows irregularities over time. As a result, sometimes a large part of the infrastructure remains idle, and sometimes it cannot meet the increasing expectations. The following conclusions can be drawn up in detail:

- Education is of great importance in every age and every aspect of life, and institutions must build on sound technological infrastructure so that educational services can be well implemented. In addition, it is necessary to continue to improve the infrastructure to respond to rapidly growing expectations in a timely manner.
- The establishment of technological infrastructure and continuous improvement in accordance with changes in technological aspects brings a heavy burden on the economy and manpower. Cloud computing model is an alternative solution to reduce the burden on infrastructure.

- The second big wave of the Internet called cloud computing is a concept that is provided on the Internet, with the expression of real-time IT services and resources.
- In the cloud computing model, the infrastructure is updated by service providers and users can use the services to meet their expectations without having to invest in infrastructure. Thus saving from the costs of infrastructure, and thus educational institutions have the opportunity to allocate more resources to the teaching process.
- Cloud computing enables the addition of new resources to the system in line with dynamic scalability needs. In this way, in accordance with expected or unexpected increases in service utilization or other infrastructure expansion needs, the sustainability of the service is ensured uninterrupted.
- Cloud computing has become more popular with the opportunities it offers, and its use in dynamic development areas such as education is increasing day by day. When flexible cloud computing solutions are combined with the economic dimension, educational institutions are increasingly geared towards cloud computing.

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