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Cloud Computing Application and Its Advantages and Difficulties in the Teaching Process

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Abstract

The objective of this research is to identify the technology of cloud computing in terms of its concept, its development, its objectives, its components, models, classifications, and the advantages of its use in the teaching process at the University of Samarra, as well as to identify the most important challenges and obstacles that teachers face in using University of Samarra. The researcher used the descriptive approach in his research. This research was carried out on an objective sample of 40 teaching staff members in the Department of Life Sciences and English at the Faculty of Education / Samarra University. A questionnaire consisting of 22 questions were used as a data collection tool, which included two axes: The first axis: the advantages of using cloud computing technology in the process of teaching at the University of Samarra. The second axis: the challenges of using cloud computing technology in the process of teaching at the University of Samarra. The researcher used the statistical program (SPSS 20) in order to examine the differences between the responses of the members of the research sample. The results

revealed that the estimates of the teaching of the advantages of the use of cloud computing technology in the teaching process at the University of Samarra, which included the search tool, came very much, and the results revealed the most important challenges which stand in the way of the use of cloud computing technology in university education. The study recommended institutions of higher learning and universities with a set of important recommendations regarding the use of cloud computing technology in educational institutions.

Keywords: Cloud computing; Challenges; Teaching.

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Introduction

The techniques of e-learning have developed rapidly and rapidly in recent years and have become essential tools in the process of delivering and transferring information to students, learners and teachers in most countries, wide use of new types and methods of education in educational institutions (Damez, 2009). The most important of these developments is cloud computing technology as it is a business model for the beneficiary. This model offers applications and data to the beneficiary in the form of services through the Internet, and helps in providing self-service and gives flexibility in selecting the appropriate sources for each institution, in addition to the cloud computing technology is a method In order to manage the infrastructure, as it reflects the way to manage the resources located in many sites so that they appear as a single resource providing all those services and resources (Ahmed Amin, 2012). At present, educational institutions face a great number of difficulties, including the difficulty of keeping pace with the rapid changes in modern communications and information systems. The process of developing the techniques used in the educational process requires huge sums of money in addition to the costs of modern software. Cloud computing, which is the perfect solution for all these problems, where students, learners and educators can access these applications at any time and from anywhere in this world through the use of devices connected to the network Such as computers or mobile devices (Wafa, 2013). Cloud computing is a technology based on the principle of transfer of processing and storage space of computers to the so-called (cloud): which is a server-specific devices are accessed through the Internet, where the programs turn from products to any services, and users can access Through the Internet, without the need to have experience or knowledge of hardware or equipment (Al-Ahmadi, , 2014). Study of (Mohamed Anwar, 2012) have pointed out the importance of using cloud computing technology in educational institutions in order to take advantage of the great potentials and advantages of this technology. Study of Mrdalj (2011) confirmed that cloud computing is the ideal solution for implementing Cost-effective learning environments and teaching aids. In addition (Doalitzscher et al., 2011) which focused on the development of an electronic cloud at the University of the German University (HFU) in support of e-learning, Cloud computing technology had a role as a PIR is very active in developing and supporting the performance of students and learners by supporting three major pieces: (infrastructure, software as services, and processing services).

Definition of research

Research problem: A number of previous studies have confirmed that the use of cloud computing technology in the teaching process in educational institutions has had a positive impact on the improvement of student levels, so there is a great interest in cloud computing technology at the local or global level, because of the great advantages of this technology Where flexibility and interactivity have become an economic and ideal choice because it does not require significant expenses in exchange for its great services in terms of participation and document management. Cloud computing at present can become a new trend in education in educational institutions (Al-Ahmadi, 2014).

All of the above prompted the researcher to conduct this research in order to identify the technology of cloud computing and what are the advantages and challenges of using it in the process of teaching at the University of Samarra, as the results of this research will help to open the way for making the appropriate decisions for the use of this technology At the University of Samarra, the problem of research can be shaped by the main question: the advantages and challenges of adopting cloud computing technology in the teaching process at the University of Samarra..

Research Objectives

1. Understand the concept of cloud computing and its classifications and service models.
2. Identify the requirements of using cloud computing technology in the teaching process.
3. Identify the most important features of the use of cloud computing technology in the process of teaching
4. Identify the most important challenges and difficulties in the use of cloud computing technology in the process of teaching at the University of Samarra.

The importance of research

1. Clarifying the role of cloud computing technology in the field of teaching and use in the field of e - learning in educational institutions.
2. The results of this research help in the definition of specialists on the reality of the use of cloud computing technology in universities and educational institutions.
3. The results of this research help university and educational officials make critical and positive decisions about the need to use cloud computing technology in the teaching process at universities.
4. The current research helps to discover the advantages and possibilities of cloud computing technology in providing new and innovative solutions to address educational problems in educational institutions.

Research limits

The objective boundaries: This research is interested in the definition of cloud computing technology, and what are the requirements and advantages used in the process of teaching in universities, and what are the most important difficulties and challenges that stand in front of the use.

Time Limits: This research was applied during the first semester of the academic year (2018-2019).

Spatial boundaries: Samarra University / College of Education.

Research terms

1. Cloud computing: (Jang, 2014) defines cloud computing as the use of computer resources, which include software and hardware, which are rendered as Web services, where the user has the ability to use his or her own data stored on the cloud server through Access cloud applications via computers or smartphones that are connected to the Internet.

Operational definition of cloud computing: It is a service technology that allows students, learners and teachers to transfer their data and files and stored in the so-called cloud electronic processing is done within the cloud, and users can access their files and data anytime, anywhere in the world by Use cloud applications through computers or smartphones connected to the Internet without users caring how the service works.

2. Teaching: (Attiyah, 2009) defines teaching as: all the possibilities and conditions provided by the teacher in a given teaching position, as well as all the actions taken by the teacher, in order to help the students achieve the specific objectives of that position.

The definition of procedural teaching: It is a continuous activity has been planned, and this activity aims to teach students in the Faculty of Education University of Samarra using cloud computing technology and then work on the evaluation of this education in order to obtain the best educational outputs.

3. The theoretical framework and the previous studies

3.1. The concept of computing: The first use of the concept of cloud computing in (1997) by (Ramnathk Chellappa) during the conference of the Institute for Operations Research and Management Sciences (Chee & Franklin, 2009) suggests that the concept of computing, though a new concept, By the American scientist John McCarthy at Stanford University in 1960, when he expressed that "computing may one day be organized to become a public good." (Sayed, 2013) points out that a cloud is a model used to provide secure, appropriate and continuous access to the network at any time and from any place for the participation of a very large set of data and computer resources that can be deployed and provided with minimum effort or interaction with the provider The cloud computing technology has finally emerged as one of the methods of computing where computer resources are provided as services, and users can access these resources through the Internet without having to have the expertise, knowledge or infrastructure that supports these services. Atta (2011) defines cloud computing as the process of transferring the processing from the user's machine to the server's hardware through the Internet, where the user files are stored in the servers and the user can access his files at any time and from any place where Software becomes a service, and maids often use virtualization techniques to allow multiple users to use the same service.

3.2 Cloud computing applications: As for cloud computing applications, they offer three services to which (Lenk et al., 2009; Aumueller, 2010; NIST, 2011; Shaath, 2014) as follows:

3.2.1. Infrastructure as a Service: This service provides a virtual server that has unique virtual internet addresses, is stored in it, and can be accessed through the use of a software application interface. This service is designed for Increase or replaces data center functions completely, and this will help save costs of expenses and time services are in this type such as: (Amazon web services awes) and (windows live sky drive services). This type of service was first described in 2006 as a special concept for the process of renting IT devices or the entire data center as a subscription service. Can be changed by increasing or decreasing according to the requirements of the beneficiary.

3.2.2. Platform as a Service: This system connects the development environment as a service to the beneficiaries. It is a virtual server that allows users to run existing applications or to develop new applications without worrying about how to maintain On the operating systems, or servers, so that the beneficiaries can build their own applications that work on the infrastructure of the provider, and the applications are provided to the beneficiaries through the Internet and examples of this type (yahoo pipes) and (force), This type of service is Software developers aim particularly where it is to provide an environment for hosting applications for the beneficiary, as he can control the beneficiary of the applications that work in the hosting environment with ease, but it has nothing to do with the process of basic infrastructure management cloud or control.

3.2.3. Software as a service: This type of service is the most widespread within the cloud computing technology, which connects a single application through the browser to the beneficiaries, and is the most prevalent type of other types, and provides this service to students And users access to e-mail, operating system, and office programs, and this service includes specialized programs for researchers and learners that require the operation of virtual experiences, and this service allows users to share with other users as determined by the same user, and the most famous companies that offer this Service is a company (Google), which provides a service (Google Mail), as well as the company (Microsoft), which provides a service (Ms Online Services).

4. Cloud computing classifications

Sheiti (2013), Mircea and Andreescu (2011), and Wafa (2013) suggest that computerized fasteners can be categorized into four basic propagation models:

4.1. Private or internal cloud: A cloud in terms of technical concept, as it represents private networks and is built for use by certain parties, and this cloud is not open to the public, but is closed to a specific number of customers, Such as a cloud for a university or a government institution, provides complete data control with emphasis on security and data quality. Examples of this cloud are Virginia University's cloud.

The most important feature of the Private Cloud:

- The private cloud is hosted at an offshore facility or within an establishment.
- Helps the facility to provide the opportunity to control the cloud.

4.2. Public Cloud: This cloud represents the public access environment and cloud services are addressed to the public people, the cloud infrastructure is publicly available and owned by the organization of the sale of cloud services and examples of cloud (Microsoft Google Docs).

The most important feature of the public cloud:

- The general cloud is located in an external facility.
- The general cloud works to provide its services to a large number of customers and beneficiaries.
- The general cloud is a flexible tool that contributes to saving costs and reducing expected risks.
- The general cloud is hosted in a place that is far from the clients' place.

4.3. Community Cloud: A cloud that is limited to organizations or companies with the same goal of service. These organizations share all expenses and expenses. This cloud supports a community that has a common interest in providing security, availability and data access requirements, and examples of this Cloud (Education ERB.Net).

The most important characteristic of the community cloud:

- The community cloud is the latest form of cloud computing technology.
- The community cloud has helped to establish cooperation between the labor market and education based on quality and creativity.
- The community cloud contributed to the allocation of its services in terms of educational curricula and educational and professional needs of the community.

4.4. The hybrid cloud: The infrastructure in this cloud consists of two clouds or more (public and private or public and community), and the services of this cloud is complementary between more than a cloud and the process of linking with each other a certain technology helps in the process of access to data and applications, The data is stored and stored in the private cloud database while managed by a user in the public cloud so that the customer can take advantage of private cloud services in the public cloud, such as large electronic shopping sites. Examples of this cloud are (Microsoft Dynamics.com).

The most important feature of the hybrid cloud:

- The hybrid cloud is used in a facility with small data or needs its own applications.
- The hybrid cloud combines in its characteristics between general and special clouds properties.
- In the hybrid cloud, the customer can choose between applications and services of the general cloud or cloud.
- In the hybrid cloud of the facility the choice of maintaining control and security.

4.5 Characteristics of cloud computing technology: (Fallik, et al., 2012), (Miller, 2009) see there is collection of main characteristics of cloud computing technology are:

1. User-Centric: By connecting to the cloud, all images, documents and applications stored on the cloud are owned by the user and can be shared with other users over the Internet.
2. Task-Centric: Instead of focusing on applications and what you can do, focus on the needs of users and how applications meet these needs.
3. Computer Power: It connects millions of computers to each other in the cloud.
4. Accessibility: The process of storing data in the cloud provides users with the possibility of immediate recovery of more data and information from many repositories.

5. Infrastructure-Centric: Cloud provides large servers that contribute to complex operations, helping to eliminate the burdens of infrastructure creation and management and focusing only on basic requirements.
6. Effective use of available resources: The cloud works to provide available resources as needed, leading to optimal utilization of these resources.
7. Cooperation: Cloud works to provide a feature of cooperation between users, whether within the same institution or between a number of different institutions.
8. Programming: Many of the basic tasks with cloud computing technology must be programmed in such a way as for example, for example to maintain the integrity of the data and the process of storing information on a computer in the cloud, it is necessary to be copied on other computers In the cloud, if a computer is out of the network, the cloud is responsible for reprogramming automatically from that computer to another new computer in the cloud.
9. Customization: The cloud can reshape its environment and customize and modify it in terms of applications and infrastructure is done at the request of the user.
10. Pay Per Use: Users pay the consumption fee based on the size of the use of resources as well as the use of bandwidth and storage.
11. Self-healing: Self-healing means the possibility of using a backup copy instead of the original version in the case of failure in the application that is used in the cloud environment without having any impact on the operations because there are multiple copies of the same application Each of these copies updates itself regularly, as there is always one copy that has the capability to work if the application fails.
12. Green technology: Environmentally conscious are all expressions of interest in the environment. This can be achieved by the cloud's sharing of computing resources among a group of users, thereby reducing energy consumption, reducing pollution and reducing emissions of process gases. Global warming, and this shows the great importance of the term green computing, which is used recently in dealing with matters related to the environment.

4.6. Requirements for the use of cloud computing technology:

Remember (Yassa, 2014) that there are a set of basic requirements for using cloud computing technology as follows:

1. A computer: any computer with medium or medium capabilities that allows communicating with the Internet.
2. Provide high-speed Internet connection It is the link between the user and his data and all the software he uses.
3. Operating System: Any operating system that allows communication with the Internet and this feature is available in almost all operating systems
4. Provide an Internet browser: any type of browsers as long as the large sites are compatible with it.
5. SQL Server cloud computing: It is a SQL-like in most of its features a web hosting service provider but an increase in some characteristics, even allowing users to use the resources available in the servers more efficiently.

Al-Saheem (2015) and Al-Jalefi (2014) add that there are a number of basic requirements that must be met in order to use cloud computing technology in educational institutions:

1. Providing specialized centers to connect to the Internet in each university, college or educational institution. The speed of the network is high speed and is available permanently and continuously.
2. The creation of a community withdrawal under the auspices and responsibility of the Ministry of Higher Education and Scientific Research means the clouds serve the purposes of research and education for teachers and students and learners.
3. Linking the newly created computer clouds to a single government cloud.
4. Work to create and provide specialized educational platforms to be available and in the service of all colleges, universities and educational institutions.
5. Work to create and provide appropriate training courses for teaching staff in universities and educational institutions on the use of cloud computing technology.
6. Work on the need to raise awareness of teaching staff in universities and colleges in institutions of higher education the importance of keeping pace with modern trends and contemporary in the fields of education.
7. To raise awareness and guidance of educational departments in universities and educational institutions on the importance of using cloud technology services on their devices.
8. Verify that the school's infrastructure complements cloud-based services, as some cloud services have the ability to support and integrate with existing technology and work to increase its effectiveness. In addition, compatibility with the institution's infrastructure will be a step in the direction of going towards cloud computing services and then adoption.
9. Check and make sure that the university and school network environment is ready to handle cloud computing services, so the security and quality of service component of these networks must be available.
10. To create and provide financial resources for the use of cloud computing technology in universities and educational institutions.

4.7. The advantages of employing cloud computing technology in the educational process:

Oyeleye (2014) recommends the adoption of cloud computing technology in universities and educational institutions where cloud computing can help universities and educational institutions in:

1. Cloud computing technology helps to absorb the large increase in the adoption of smart devices.
2. Cloud computing technology helps to use applications without having to install on the computers of users, as well as allow access to files and data stored on computers that are connected to the Internet.
3. Cloud computing technology helps to meet the ever-increasing needs of energy resources and costs.
4. Helps store large amounts of data that are easily accessible from anywhere in the world.
5. Cloud computing technology helps to create infrastructure for development research.
6. Cloud computing technology helps create virtual classrooms.
7. Cloud computing technology helps with electronic testing.
8. Cloud computing technology helps send projects and training to students.
9. Cloud computing technology teaches students new ways of innovative, enabling them to manage their projects and the completion of their duties easily.

10. Cloud computing technology enables students to use modern and sophisticated technological tools that enable them to work.
11. Cloud computing technology helps develop computer skills for students and teachers.
12. Cloud computing technology helps to take advantage of virtual labs in experiments that are difficult to perform in normal situations because of the lack of materials, tools and capabilities required.

4.8. Challenges for using cloud computing technology in higher education institutions:

Although there are many characteristics and advantages of cloud computing, there are a range of challenges that limit the use of enterprise cloud computing technology. These challenges are cited by (Al-Rahili, 2015; Sayed, 2013; Linthicum, 2010):

1. Security: Cloud computing technology depends completely on the provider of the service and the provision of security level, such as encryption of data and information and to develop special policies to reach the cloud and this leads to raise a number of questions such as:

- Such as whether data and information will be secure.
- Who can access data and information?
- Malware can damage data and applications in the cloud.

2. Reliability: Many institutions and universities have fear and fear of adoption of cloud computing technology because of the adoption of this technology on the Internet as these institutions have a set of questions, for example: Can cloud computing technology to meet the needs of enterprises for (24) hours without Disruption of service.

3. Control: It means that institutions and universities when adopting the use of cloud computing technology will be under the control of the service provider, which can cause organizations a range of problems in the case of running files and data in the cloud infrastructure with the possibility of service interruption for any reason Institutions or universities have to look for a solution or alternative.

4. Internet service availability: In the absence of the Internet service to the user, it means the inability to access and access files of his own, in addition to the inability to access the applications of the cloud, in addition to the presence of communication is inadequate where this connection should be fast Including enough to do the work required.

5. Performance: Cloud computing is experiencing a lot of performance problems, which requires the cloud service provider to ensure that the level of service performance provided by the cloud remains constant in all cases, where peak working time may occur in service disruption or may occur various internal faults It is therefore necessary to install the following services: such as Load Balancer, High End Servers, Data Replicators.

6. Cost: Cloud computing technology can experience higher costs resulting from constant communication requirements and the use of large amounts of data inside the cloud.

7. Regulatory requirements: Cloud computing business environments are subject to any legal, legislative or regulatory systems? Information and data stored by different network services are subject to the legal and regulatory systems of the country where the cloud is located, as well as

the country containing the primary server, Complicated for transient data that needs special regulation.

8. Quality Issues: The quality of the cloud service provider may not be as good as if there is a fast connection, the speed of processing in the cloud is likely to be slower than if the work was done on the user's own machine, in which case the user is not happy Working in the cloud.

9. Failure to meet the needs of the institution: The cloud may not be able to meet the needs of the beneficiaries or the institution, because it is not available to the cloud service provider.

10. Applications for cloud computing have not yet reached the required level: Most of the applications for cloud computing have not reached the level of desktop applications, for example, applications for editing text through web applications applications) has not yet reached the level of Microsoft Office Applications but is gradually approaching this level over time.

11. The problem of the protection of intellectual property rights is one of the most important problems that cause fear and fear among the users of these services, as there are no guarantees that the intellectual property rights of users will not be violated.

4.9. Previous Studies

4.9.1. Study of (Mansour, 2013): entitled: Fears and Challenges of Adopting Cloud Computing Technology in Higher Education Institutions - Case Study of the Islamic University - Gaza.

The study aimed at clarifying the challenges and risks of adopting cloud computing technology at the Islamic University of Gaza. The researcher used the descriptive analysis method to illustrate a range of variables (senior management support, security effectiveness, and cost reduction) to adopt cloud computing technology. The researcher used the questionnaire tool for data collection. The study population consisted of (95) computer and IT professionals. The study showed a number of results, the most important of which were:

- Cost reduction is based on cloud computing technology.
- The university has the ability to support and process the integration of university services with cloud computing technology.
- The Islamic University of Gaza does not provide training programs for staff or send them to scientific missions in order to benefit from modern technologies such as cloud computing technology.

4.9.2. Study of (Klug, 2015): entitled: Factors Affecting Cloud Computing Adoption Among Universities and Colleges in the United States And Canada.

The study aimed to identify the factors that determine the adoption of cloud computing in a number of universities and colleges in the United States and Canada. In his study, the researcher used the data collection tool to test the relationship between the independent variable (adopting cloud computing) (Comparative advantage, compatibility, enterprise size, technological readiness, expected challenges, organizational policy, technical support services provided by the service provider). This study was applied to a sample of (119) IT managers and IT managers Academies and colleges in Canada and the United States.

This study reached a number of results:

- There is a statistically significant relationship to the adoption of cloud computing technology due to variables (complexity, size of the organization, and technological readiness).

4.9.3. Study of (Chikhaoui, 2015): entitled: Impact of Cloud Computing on the Saudi Sectors, Computing and Information Technology.

The study aimed to identify the effect of using cloud computing technology in the education sector in Saudi Arabia. The study used the descriptive method. The questionnaire consisted of three axes with a total of (66) paragraphs. The study sample consisted of (143) Teaching at Prince Sultan University in Riyadh. The results showed high impact from the point of view of teaching staff to use cloud computing technology in education and in all areas: academic calendar and the design of teaching courses.

5. Analysis and discussion of the results

5.1. Research Methodology: The researcher used descriptive analytical method.

5.2. Research Community: The research community is damaged by all faculty members in the Department of Life Sciences and English Language at the College of Education/ Samarra University, with the rank of professor, assistant professor, teacher and assistant teacher during the academic year 2018-2019.

5.3. The Research Sample: The researcher chose the research sample in a rational way in order to ensure the homogeneity of the sample of the research sample. The researcher chose (20) members of teaching staff in the life sciences department in the Faculty of Education. Teaching in the Department of English Language at the College of Education, Samarra University. Thus, the total of the research sample reached (40) members of teaching staff in both the above mentioned sections.

5.4. Research Tool: To achieve the objectives of the search was based on the questionnaire as a tool to collect data, has been the paragraphs of the questionnaire according to the scale of the fifth Leckert, the questionnaire was prepared in the first image has included two axes:

The first axis: What are the advantages of using cloud computing technology in the process of teaching at the University of Samarra, and this axis consists of (10) paragraphs.

The second axis: What are the challenges of using cloud computing technology in the process of teaching at the University of Samarra, which consists of (12) paragraphs.

5.5. Verification of The Research Tool (Questionnaire): In order to ascertain the veracity of the veracity of the questionnaires, the researcher presented them to a group of arbitrators with expertise and experience in order to ascertain the appropriateness, formulation and extent of achieving the objective for which it was established. The arbitrators agreed to the questionnaire, and limited their observations to amend the wording of some paragraphs of the questionnaire. The opinion of the arbitrators is evidence of the validity of the content of the virtual questionnaire. The questionnaire was presented in its final form, and the number of its paragraphs reached (22) paragraphs.

5.6. Stability of the Tool: The stability of the questionnaire was verified by using the alpha-chromatography method to find the stability coefficient of the questionnaire. The stability factor

for the identification axes was calculated. The results showed that the search tool is stable as shown in Table 1.

Table 1. The coefficient of alpha – Cronbach stability of the axes of the questionnaire

Questionnaire axis	No. of items	Stability coefficient Cronbach Alpha
The first axis: the advantages of using cloud computing technology in the process of teaching at the University of Samarra	10	0.686
The second axis: the challenges of using cloud computing technology in the process of teaching at the University of Samarra	12	0.673

Results

Presentation and discussion of the results related to the first question: the advantages of using cloud computing technology in the process of teaching at the University of Samarra .In order to answer this question, the researcher calculated the arithmetical averages and the standard deviations of knowledge. The answers of the research sample members on the advantages of using cloud computing technology in the teaching process at Samarra University.

Table 2. Mathematical averages and standard deviations of the sample responses of the study on: The advantages of using cloud computing technology in the teaching process at Samarra University

Rank	Paragraph number in the questionnaire	Paragraphs	Arithmetic mean	Standard deviation
1	9	The use of cloud computing technology in the teaching process reduces time and effort.	2.68	1.979
2	10	The use of cloud computing technology in the teaching process helps to self-learning.	2.58	1.960
3	7	The use of cloud computing technology in teaching at universities helps to achieve quality in the educational process.	2.50	1.922
4	1	Cloud computing technology helps you access files stored on the cloud from anywhere.	2.48	1.935
5	3	The use of cloud computing technology in education provides a safe and appropriate learning environment in the educational field.	2.45	1.907.
6	8	The cost of using cloud computing technology in teaching is low when compared to other technological methods.	2.40	1.851.
7	2	Cloud computing technology provides users with high fragmentation capacity and free of charge.	2.38	1.835
8	4	The use of cloud computing technology in education helps collaboration among faculty.	2.33	1.789
9	5	The use of cloud computing technology in teaching does not require downloading software on users' devices.	2.28	1.739
10	6	The use of cloud computing technology in teaching does not require a major mental effort	2.23	1.687

Introduction and discussion of the results related to the second question: The challenges of using cloud computing technology in the process of teaching at the University of Samarra In order to answer this question, the researcher calculated the arithmetical averages and standard deviations of knowledge. The research sample respondents on the challenges of using cloud computing technology in the teaching process at Samarra University.

Table 3. Mathematical Meanings and Standard Deviations of the Sample Responses of the Study on: The Challenges of Using Cloud Computing Technology in the Teaching Process at the University of Samarra

Rank	Paragraph number in the questionnaire	Paragraphs	Arithmetic mean	Standard deviation
1	11	The weakness of the university infrastructure in terms of providing the appropriate technical environment and electronic technologies and devices.	2.25	1.836
2	10	Lack of financial resources to use cloud computing technology in universities.	2.15	1.791
3	1	Difficulty of providing fast Internet connection within universities.	2.05	1.739
4	2	Weak and slow internet and high subscription costs.	1.95	1.679
5	4	Lack of appropriate training courses for teachers in the use of cloud computing technology.	1.85	1.610
6	12	Privacy and security for educational institutions.	1.75	1.532
7	9	Lack of knowledge of some teaching staff members with computer skills.	1.70	1.454
8	8	Lack of awareness of some faculty members of the importance of using cloud computing technology in the educational field.	1.65	1.369
9	3	Dependency on computing service providers Organizations may find it difficult to access their data.	1.60	1.277
10	6	The use of cloud computing technology is surrounded by many uncertainties and risks compared to other technologies.	1.55	1.176
11	7	Lack of time to use cloud computing technology in education.	1.50	1.062
12	5	The use of cloud computing technology is inefficient because of the high cost.	1.48	0.987

Discussion

The research questionnaires revealed a set of results related to the current research axes as follows:

- The first axis: the advantages of using cloud computing technology in the process of teaching at the University of Samarra: The search results revealed the most important features are: The results of the research revealed the most important features: the use of cloud computing technology in the

teaching process reduces the time and effort Table 2, and also the use of cloud computing technology in the teaching process helps to self-learning Table 2, and also the use of cloud computing technology in teaching (3). In addition, cloud computing helps access files stored on the cloud from anywhere in Table 2, and the use of cloud computing technology in education provides a safe environment for safety use and In the field of education (Table 2).

- The second axis of research: the challenges of using cloud computing technology in the teaching process at the University of Samarra: The results of the research revealed the most important of these challenges: weak university infrastructure in terms of the availability of the appropriate technical environment, technologies and electronic devices Table 3, also lack of financial resources for the use of cloud computing technology in universities Table 3, in addition to the weakness and slow Internet and the high costs of their subscription Table 3, as well as the lack of training courses suitable for educators in the use of cloud computing technology Table 3.

Recommendations

1. To provide universities and educational institutions with Internet service at appropriate speeds and continuously to benefit from the services provided by cloud computing technology.
2. Work to raise awareness among teaching staff at universities of the importance of using cloud computing technology in the process of teaching in educational institutions.
3. Urge university and educational teachers to use cloud computing technology as an important and fundamental model in the teaching process.
4. To employ cloud computing technology as a solution to address infrastructure problems in universities and educational institutions.
5. Work on the acquisition of teaching staff in universities and educational institutions crisis skills in order to use and employ the computer in the teaching process.
6. Conduct further studies and research on the subject of cloud computing technology in other environments.
7. To provide universities and educational institutions with Internet service at appropriate speeds and continuously to benefit from the services provided by cloud computing technology.
8. Work to raise awareness among teaching staff at universities of the importance of using cloud computing technology in the process of teaching in educational institutions.
9. Urge university and educational teachers to use cloud computing technology as an important and fundamental model in the teaching process.
10. To employ cloud computing technology as a solution to address infrastructure problems in universities and educational institutions.
11. Work on the acquisition of teaching staff in universities and educational institutions crisis skills in order to use and employ the computer in the teaching process.
12. Conduct further studies and research on the subject of cloud computing technology in other environments.

Conclusions

1. If the use of cloud computing technology in the process of teaching at the University of Samarra, it will have a significant positive impact on increasing the educational achievement of students.
2. If the use of cloud computing technology in the process of teaching at the University of Samarra, it will help to increase self-education for students.

3. If the use of cloud computing technology in teaching, it will help to increase cooperation between faculty members.
4. If the use of cloud computing technology in teaching, it will help teachers and students to access files and lectures stored on the cloud from anywhere in the world and at any time.
5. If the use of cloud computing technology in teaching, it will help to reduce the time and effort for the student and teaching.

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