التعلم الإلكتروني القائم على الحوسبة السحابية: دراسة للعوامل التكنولوجية

Cloud based E-Learning: A Review of Technological Factors

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الملخص

يقدم هذا البحث مراجعة لاعتماد التعلم الإلكتروني القائم على الحوسبة السحابية في جميع أنحاء العالم بالإضافة إلى تقارير عن النتائج مثل القضايا والفوائد والمرتبطة باعتمادها، فإن اعتماد هذا الابتكار المعقد مهمة معقدة كما ناقشتها الدراسات السابقة؛ وبالتالي ، فإن الدراسة الدقيقة والتخطيط لجميع العوامل الحاسمة التي تؤثر على عملية التبني من خلال المتعلمين مطلوب. الغرض من هذه الدراسة هو فحص العوامل التي تؤدي إلى هذا الابتكار التكنولوجي الجديد على وجه التحديد، قمنا بفحص العوامل والنتائج التكنولوجية المتعلقة بقبول التعلم الإلكتروني القائم على الحوسبة السحابية في المؤسسات التعليمية. تم إجراء الدراسة باستخدام تصميم بحث استكشافي دراسة غير تجريبية. تضمنت هذه الدراسة الاستكشافية تحقيقًا أساسيًا حول البيانات الثانوية. تطوير الدراسة ونمذجة البيانات الثانوية لإبراز النتائج النهائية للبحث. يمكن مشاركة النتائج للمعلمين المستقبليين لدمج التعلم الإلكتروني المستند إلى السحابة باستخدام العوامل التكنولوجية كجزء منتظم من ممارساتهم التعليمية. من خلال مراجعة اخر الدراسات والنماذج الحديثة، تبين من خلال البحث أن عوامل العوامل التكنولوجية التي تشجع أصحاب المصلحة على اعتماد التعلم الإلكتروني القائم على السحابة في المؤسسات التعليمية ستكون ضرورية قريبًا ولا تزال غير واضحة وتحتاج إلى مزيد من التحقيق

Abstract

This paper presents a review of cloud-based e-learning adoption all over the world in addition to reports on findings such as issues and benefits and associated with CC adoption. However, the adoption of this complex innovation is a complicated task as discussed by the literature; thus, careful consideration and planning to all crucial factors that affect the adoption process through learners is required. The purpose of this study is to examine the factors that lead to this new technology innovation. Specifically, we examined the technological factors and outcomes relating to the acceptance of a cloud-based eLearning in educational institutions. The study was performed utilizing a non-experimental study exploratory research design. This exploratory study included an essential investigation about secondary data. The study development and modeling of secondary data in order to highlight the final results of the research. The results can be shared for future educators to integrate cloud-based eLearning using the technological factors as a regular part of their instructional practices. Through reviewing the literature of the existing frameworks, it is showed that the factors of technological factors that encourage stakeholders to adopt cloud-based e-learning in educational institutions will be soon necessary and they are still unclear and need further investigation.

Index Terms— Cloud computing (CC), Cloud-based e-learning, educational institutions, Technology adoption, Technological factors, Review study

INTRODUCTION

One of the advancements recently introduced by information technology (IT) is the cloud computing trend. Cloud computing (CC) is the result of developments in various technology including the Internet, infrastructure, system administration and distributed computing (Kadhim, Yusof, Mahdi, Al-shami, & Selamat, 2018). CC is a Web-centric computing service that employs and provides IT services to companies through the delivery of tools over the Web using web-centric applications and gadgets without the support of any private IT infrastructure within the business. The cloud-based e-learning framework is the product of such experimentation and over time this online activity is improving (Jayasena & Song, 2017). The new CC technology and wireless networking open up new learning possibilities for the students.

CC provides a range of facilities including storage and various modes of use (Başaran & Hama, 2018). Cloud computing lets public institutions provide technology assistance and escape the need to build their own IT infrastructure (Meri, Hasan, & Satar, 2017). Armbrust et al. (2010) This indicated that CC is a series of programmes that use hardware and software systems to provide end-user services over the Internet. CC is a exciting opportunity for educational institutions faced with financial restrictions and growing student demographic, with its focus on providing low-cost or free software anywhere on the Internet. Corporate vendors are keen to promote institutional use of CC ; for example, Google has made a unique education version of its cloud-based Google Apps and advertises the number of educational institutions that adopted this package on their website (Google, 2009).

E-learning is commonly defined as instruction in teaching and studying offered by an instructional device. E-learning can be interchanged with a broad variety of definitions, from online learning, cloud-based

learning, Web-based learning, computer learning, wireless learning, and so on. E-learning appears to be brought on in recent years by developments in the world of information technology. Emergence of CC technology and digital connectivity, more online cloud-based apps are projected to be used in latest wave of e-learning in higher education.

Many educational institutions have started to understand the value and significance of using cloud computing technologies in their programme (Mokhtar, Ali, Al-Sharafi, & Aborujilah, 2013). There are currently inadequate requirements for the use of cloud computing in education. An awareness of multiple dynamics and expertise in various fields is critical for the effective adoption of cloud-based e-learning (Shimba, 2010). Such advances in cloud computing have also brought about a fast and drastic growth in research and technology.

II. RESEARCH BACKGROUND

Because of the growing use of CC, the question arises as to what factors can affect information professionals in their educational institutions to implement new technologies, such as cloud-based e-learning. Considering that the use of emerging technology will help information systems perform better (Rio-Belver, Cilleruelo, Garechana, Gavilanes, & Zabalza, 2012; Salum & Rozan, 2016). Successfully incorporating CC in curriculum, however, requires close student and school commitment to a variety of variables. As the CC trend is fairly recent, few studies report on it and, moreover, no one has focused until now on the technical background of CC (Z. A. Ahmed, Jaafar, & Ghareb, 2017). The study can help to clarify the variables underlying technical factors in cloud-based e-learning which can contribute to more study in the area.

Many studies examine cloud-based and related aspects that effect educational institutions, they are usually making use of the two qualitative and quantitative techniques. In spite of significant research on cloud-based e-learning adoption which has come out in worldwide publications throughout disciplines, an overview of cloud-based e-learning literature adoption stays absent. Such a review presents an essential landmark in the research development subject. It can provide a chance to take a step back and review the intelligence of collective which is accumulated through an eclectic body of research which utilizes numerous examples, techniques, and hypotheses (M. Ahmed, Almotairi, Ullah, & Alam, 2014; Alkafagi, 2015; Meri et al., 2017; Shaikh, 2013). This work is especially important whenever the findings of separated studies contradict each other. The diffusion of CC and Wi-Fi Internet has enhance the uptake of e-learning system (Al-Alak, 2014; Al-Shqeerat, Al-Shrouf, Hassan, & Fajraoui, 2017; J.-J. Hew, Lee, Ooi, & Wei, 2015).

The concern with this analysis is that the main factors which may guide the usage of the cloud-based e-learning in educational institutions. The investigation focused on getting the views and values accepted and distribution routinely as cloud-based e-learning system (Chahal & Bakshi, 2015). This study would Be delimited with secondary data within the limits of exploratory architecture. In this study, the source of secondary data is the quest in literature, which will be the purpose of this quest for literature to analyse works from past years according to the topic. In this way, the analysis aims to determine the factors leading to develop a cloud-based e-learning adoption model for both private and public educational institutions.

This review may incorporate evolved search of internet sites, conference papers, gathering, and available information. A variety of searches were performed on article and Journals reviews, regular newspapers. Focused online search was done by using such relevant keywords such as “Cloud computing (CC)”, “Cloud-based e-learning”, “educational institutions”, “Technology adoption”, “Technological factors”, and “Review study”.

THE PURPOSE OF THE STUDY

The goal of the current study is to contribute to digital e-learning literature in schools by software applications in order to determine the factors affecting the learning experience of the students. The goal is to acquire awareness about how people benefit from cloud-based technologies and how to boost user retention for the future deployment of cloud applications. In comparison, there was an undue emphasis on human adoption and little attention on the corporate level. (Tornatzky, Fleischer, & Chakrabarti, 1990). It is therefore evident that the theoretical foundation for our study needs to take into consideration specific factors such as the technological circumstances of the organization. Tornatzky et al., (1990) Model consists of three components shaping infrastructure, organisation and society implementation of technologies. In the course of IS adoption studies, this structure was established. This study is focused on only technological

context. The factors that encourage stakeholders to adopt cloud-based e-learning are still unclear and need further investigation.

CLOUD COMPUTING

The term cloud computing identifies automated programmes or other electronic services that are accessible over the Internet to many customers, rather than running on local computers of a single user. These programmes can be accessed by users from a high-speed device without any other connexion to the hardware that houses the source software (Jayasena & Song, 2017). When a calculation is made on a remote computer, the physical demands of the customer are much smaller than otherwise, minimising costs and upkeep (Z. A. Ahmed et al., 2017).

That is why cloud infrastructure calls for school managers who wish to minimise The budgets (Darus, Rasli, & Gaminan, 2015). Cloud computing allows students to access applications, which historically was impossible either because of costs or because of weakness in the capacity of local computer equipment (Hashim, Hammood, & Al-azraqe, 2016). Additionally, cloud systems may deliver software, and are harder to run as consolidated services. Several famous email service providers such as Gmail or Yahoo are popular for these applications. Google has Google Docs (2007) in the same manner; a popular, free program that allows a user to upload a document and specify other users who can have access to it.

Experts separated the software as a service, the platform as a service and Server as a service in three layers (SaaS). Cloud infrastructure was split into two levels.

- SaaS has now modified the computing model from a system to a service definition. The software operates in the cloud, so the user can access the programme through the Internet.
- PaaS provides efficient development frameworks for developers without raising technology issues. IaaS provides complete support for connectivity (e.g. servers, applications, network equipment and stockpiling).
- IaaS does not allow customers to buy the new technologies, improve efficiency, update software (Mokhtar et al., 2013).

The implementation of cloud infrastructure can be broken down into four types: public clouds, private clouds, community clouds besides hybrid clouds (Mell & Grance, 2011). Public clouds can be viewed freely, private clouds are managed by companies, community clouds include services exchanged with those in the community, and mixed clouds have two or three cloud models.

Figure 1: Cloud Computing Deployment Models (Mell and Grance, 2011)

Each year since 2005, worldwide sales from cloud storage and developments have increased gradually. The sales figures and global cloud computing patterns from 2009 to 2016 are seen in Figure 2 (Statista, 2015).

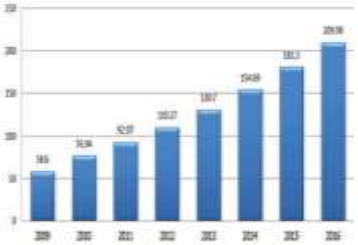

Figure 2. The global revenue of cloud computing
(Santalesa, 2011)

THE BENEFITS OF CLOUD IN E-LEARNING

In educational settings, cloud computing can be highly useful. Among the possible benefits is the enhanced usefulness of the existing technology. If it is stored beyond the machine of a customer, older computers can

stay useful for a long time. Furthermore, the school IT staff will collectively update applications or repair errors on the server level, rather than at the individual device level, resulting in less time spent on such jobs (Erenben, 2009).

Within IT literature there is extensive consideration of the advantages and drawbacks of transitioning to the cloud. By moving to cloud computing, the most popular low cost advantages are known. (Das, Classen, & Davé, 2013). The largest potential explanation for the introduction of a cloud computing platform in 2011, among 314 businesses, was cost savings (Garrison, Kim, & Wakefield, 2012). Cloud computing is economic and, depending on the provider, can also also be safe. The cost of IT is therefore reduced as no equipment is installed, managed or updated, as well as IT disaster management and operating hours (Susanto, Almunawar, & Kang, 2012). Therefore, no physical room is required to store equipment or services. (S. P. Singh & Veralakshmi, 2012). These features are also useful for data protection. Since all records are stored miles away, it should be secure in the case of a natural catastrophe or some other risk (Han, 2010). Companies, both public and private, face the challenges of preserving the infrastructure of the sector, which works to satisfy the wide variety of demands of end users. Scalability is another feature of cloud computing, since infinite capacity can be offered (Das et al., 2013). Scalability also allows more manageable workload loads even as the number of users rises while still gaining savings of scale (Marston, Li, Bandyopadhyay, Zhang, & Ghalsasi, 2011). The paradigm for cloud computing also enables people to gain connectivity globally to the cloud and use it from different hardware channels, such as desktops , notebooks, handheld devices and tablets. Danish & Sharma, (2018).

While cloud computing has been discussed as a new technology that can provide many benefits to users, the cloud computing adoption rate is not growing as fast as expected (Low, Chen, & Wu, 2011). Before implementing this technology, it is crucial to understand which factors can encourage or discourage users from accepting cloud computing as part of their life. The results of this study should help cloud computing service providers, or any organization planning to adopt this technology, understand which factors encourage or discourage their potential users to accept cloud computing, thus increasing the chance for the successful rendering of cloud computing services or the integration of cloud computing into an organization.

Additionally, there is no substantial scientific evidence of the potential advantages and risks of cloud computing (Carroll, Van Der Merwe, & Kotze, 2011; Gibson, Rondeau, Eveleigh, & Tan, 2012), the body of knowledge is included of position papers (e.g. (Armbrust et al., 2010) and depends heavily upon anecdotal proofs contained mainly in white papers, journal articles and scientific studies. (e.g. (Amini, Bakri, Sadat Safavi, Javadinia, & Tolooei, 2014; Doherty, Carcary, & Conway, 2012; Dutta, Peng, & Choudhary, 2013; U. Singh & Baheti, 2017). While several possible advantages are associated with cloud computing, other factors have discouraged certain students from adopting this technology and remain reserved for acceptance.

CLOUD-BASED E-LEARNING IN EDUCATION

Cloud computing is commonly used for many purposes, including text editing, charting, writing, video conference and e-mail, in higher education (Masud, Yong, & Huang, 2012). This strengthens the positive engagement of students, increases their academic interest and enriches their learning cycle (Hsu, 2012). Cloud computing is free or low-cost, promoting studying, social media, setting up meaning, writing, and teamwork, with users such as students and teachers. In reality, a range of cloud services don't need user apps to be installed. Any big tech providers, including Microsoft and Google, offer free education versions of their cloud-based learning management system. In example, Microsoft Office 365, Dropbox, Google Apps and YouTube are cloud-based applications. Examples include SLA is a feature that attracts educational administrator in cloud computing as it aims to provide students with access to applications and devices not already accessible (Zeilstra, 2012).

Public colleges have been delivering more distance learning courses in the expectation that more students will join by having more opportunity to complete their classes. Cloud computing in this case offers a means for students to access and operate the appropriate course applications, regardless of their location or local computer resources. For certain cases, the promise of distance learning for technology-intensive classes is not understood without cloud computing because students will have to travel to campus to use applications for school labs (Maskare & Sulke, 2014).

Many students take classes by juggling certain responsibilities and commitments, such as a full-time career or family, and are more likely to leave before finishing the degree than typical university graduates

(Sultana, Mazmum, & Nipa, 2017). Finance may also be a consideration in higher education choices, for example if petrol costs make lengthy travel to campus prohibitive (Nofan & Sakran, 2016). Or if courses need costly tech. Many of these questions can encourage university students to enjoy learning resources that help them to do their job more flexibly when and when they want to (Barnwal, Noida, & Jangade, 2014; Gupta & Thakur, 2014). Because rural schools are largely underfunded and prefer to represent a distended student community, where lengthy journeys take much more time. (Al-Shqeerat et al., 2017), Cloud Computing can also be a technical advancement that also decreases university IT costs and avoids much of student time limitations, allowing a vast number of students to use learning resources. Cloud computing systems must be incorporated deliberately and creatively into coursework if they are to be adopted and used by students; but there are no studies on this subject to inform colleges at the moment. This research seeks to accomplish this objective by defining the technical factors contributing to the successful introduction in educational institutions of cloud-based e-learning.

LITERATURE REVIEW

Since cloud-based e-learning is very recent, it is not the subject of many surveys. Several scholars carried out detailed interviews to examine the attitudes of respondents towards the online maintenance of their virtue (Odom, Sellen, Harper, & Thereska, 2012). Teneyuca (2011) The CC use patterns poll, which included IT (PT) experts as respondents, reported. Results revealed preferences for cloud infrastructure and virtualization. However, lack of cloud computer preparation was the key explanation for CC adoption in school.

Many academic studies analysed various factors that can affect the CC e-learning experience, such as correspondence, connexions and software challenges and issues (Behrend, Wiebe, London, & Johnson, 2011), as well as the level of engagement and modes of learning ((Ezzi, 2014). Understanding how these aspects affect the learning experience of students thus encourages the creation of suitable cloud-based e-learning platforms for teaching and schooling. The educators will then plan and sell the next generation of students quality cloud-based education practises.

An additional study (Ion, Sachdeva, Kumaraguru, & Čapkun, 2011) studied the behaviours and expectations of private users about cloud computing contrasted with those of corporations were discussed. Anuar et al. (2013) researched cloud computing at a university and believed that cloud computing technology increases academic educational performance. In an educational report, factors that motivated students to implement cloud computing technologies were investigated (Behrend et al., 2011).

The analysts have concluded that Cloud-based deployment poses the greatest obstacle not in technology, but in people's view and understanding of technology (Kimiloglu, Ozturan, & Kutlu, 2017). The study of user interactions influenced the learning context on a Cloud basis and also explored in depth the crucial influences that have a key impact on the application of technology (Chen, Liu, Han, & Xu, 2010). The key influences from the previous research on the same subject are user interest and contentment that is gained from the use of technology in learning (Burda & Teuteberg, 2014).

Cloud computing is possible as long as network and Internet service is accessible on handheld devices (Sandu, 2017). This means however that students living in rural and less developed areas can access learning materials through 3G links or other forms (Wang & Wong, 2019). This may also require the use of a cloud data centre to study chosen topics and this is one of the main advantages of cloud computing. The system, however, does not necessitate personal subscription, as many organisations are able to subscribe to organisations bundles which might be beneficial to the business (Li, 2010). The fact that it can be used from anywhere in the world makes it convenient for the students to use in conditions far from school or schools. Another study by (Arpaci, 2016) Where mobile cloud networks are presented, platforms, infrastructures and technologies are developed, on-demand data providers have been developed. It aims to draw on the Technology Acceptance Paradigm to recognize factors influencing the mindset of the user in the mobile cloud storage services and the expectations of their students. The suggested model was based on data gathered from 262 undergraduate students, using a structural equation approach. The findings indicate that the social interest, subjective norm and confidence affect the disposition considerably positively, which in turn is a major indicator of the conduct 's intentions.

Hew & Kadir, (2016) Behavioral aim analyzed in cloud-based VLE: extension to the principle of channel expansion. The results of previous studies may not be German in the c-VLE sense, but they were performed on the grid based VLEs due to major variations between the two computing systems. This thesis explored the role of channel theory for extension (CET), VLE associated qualities (e.g. interactivity,

interface design, website trust), school help and knowledge-share from the viewpoint of school teachers, as opposed to previous work, researching TAM, UTAUT and their extensions from the perspectives of undergraduates and university instructors. The control variables were educational level and teaching experience. Data has been obtained in two rounds of random sampling national surveys. The results suggest that CET, all VLE-related characteristics (except content design), school encouragement and information sharing behaviors on behavior aim (BI) have major effects. BI had a strong influence on the quality of training (IE). The experiment showed 68.9%, 62.5% and 28.9% in CET, BI and IE disparities.

The study of Al-Gahtani (2016), Used a theoretical approach trying to clarify individuals' judgement actions in college contexts for e-learning adoption and assimilation. A survey was performed to gather test data from 286 participants (students). In this method, the data was evaluated using the structural equation model to classify variables that affect studying purpose of e-learning using the third edition of the Technology acceptance (TAM3). This research framework was based on the structural equation model. His findings demonstrated the predicting (promoting / inhibiting) reasons for adoption of technology in the area of e-learning, when researching similar post-implementation interventions to help e-learning programmes embrace and assimilate. The findings also indicate that TAM3 is well-known within Arab society and demonstrate beneficial effects, for instance: strategic interventions and controls for better e-learning management in organizations, which contribute to greater adoption and productive use.

A previous study outlined crucial requirements for the use of cloud storage, for instance protection, deployment and internal infrastructure to enable its use (Changchit & Chuchuen, 2018). Besides these factors, another study examined the factors leading to adopting cloud computing as a virtual computing lab for a class (Behrend et al., 2011). The study results found that the ease of interpretation of stimuli would have a significant effect on potential applications, but not on current use. Cloud computing is a more effective tool for students who perform their research more easily and in a realistic manner and who are using it more often without "learning effort." This study also found that students who are worried with emerging technologies had a detrimental impact on their view of value. Another research has indicated that it is important for colleges to prepare realistic preparation to make students more acquainted with this emerging technologies to cope with technical anxieties (Blue & Tirotta, 2011).

Loebbecke et al. (2012) Analyzed a 'business preparation' framework that a organization built by defining three cloud storage aspects and three cloud preparation stages. In this report, another company with over 40,000 staff using Microsoft exchange acquired a big German company using Lotus note for email purposes and gave the company the ability to move email apps to the cloud. All customers and leadership in deciding which converted software will better reflect the strategic interests of the organization by addressing enforcement and requirements. In this case, the decision-making process involved. The approval of this change from both customer and leadership groups demonstrated a degree of "web readiness" required for the organization to thrive. Another research was undertaken to analyses how most organizations respond conservatory to the corporate implementation of cloud services. The results reinforced the effect of the status quo bias on acceptance and demonstrated that systemic control, rising income and rising costs are significant perceived interest drivers. (Fan, Chen, Wu, & Fang, 2015).

Gangwar et al. (2015) introduced an application approach in the organization-wide Cloud Computing Adoption Approach (TAM) and Technology Organizational Environment (TOE) framework. As essential variables for influencing Cloud Computing adoption with a perceived ease of use (PEU) and perceived usability (PU) as mediating variables, the study identified relative gain, flexibility, sophistication, readiness for the organizations, strong management engagement and preparation. Competitive competition and funding for trade partners have specifically influenced the goals of cloud adoption. 62% of cloud usage was clarified in the study. Report Deters, Cuthrell, & Stapleton (2010) explains how all of these cloud computing platform systems are being rapidly used by educators and students for experiments and activities. Koh and Lim (2012) further reported that 64% of higher education students use Google Docs and Microsoft Office 365 electronic communication programmes at least many times a month to remain linked to their peers, to study and to work on courses.

This research reveals that the primary and important technical factors impacting cloud-based e-learning are little understood in educational institutions. The research looks at the large institutions that are aware of the benefits of cloud-based e-learning technologies but are ignorant of the key reasons that could have contributed to the emerging technology being adopted and dismissed by educational institutions.

THE TECHNOLOGICAL CONTEXT

The technical background involves the technology available to an enterprise and explores how these technological influences impact the mechanism of acceptance (Tornatzky and Fleisher, 1990). According to Rogers (2003), The probability of acceptance – relative gain, performance, sophistication, testing and observability – is determined by five development considerations. The relative gain involves the degree at which an attribute is better viewed than the concept to be substituted. The degree to which an idea is viewed as aligned with the current beliefs, prior expectations and desires of future adopters. Complexity is the complexity experienced in the application of creativity when testability refers to the degree of which invention in small parts is evaluated in checked over time. Eventually, observability refers to the awareness of technological adopters to the consequences to invention (Rogers, 2003).

Figure 3. Technological context of Cloud-based e-learning

FUTURE RESEARCH AND LIMITATION

A small scope of research exists in recent studies on the factors driving the implementation of e-learning cloud-based education. The study data where obtained only from different related field studies. Studies will be submitted to more universities to generalize their results, and more students must be targeted. More rigorous work is also required to discover some of these variables from a number of points of view. In comparison, a potential research approach incorporating qualitative and quantity methods of analysis to define additional variables is proposed. The research approach will be balanced. Furthermore, people must be aware of what is being done and must be aware of the advantages. In order to help understand cloud computing use, this research offers scientific evidence for hypotheses correlated with mainstream implementation of technologies (i.e. Rogers , 2003; Tornatzky and Fleischer, 1990). More work will intensify each study component and stage, and concentrate on specific analytical lenses that take technical, environmental and organizational considerations into account. In fact, it would be useful to recognize correlating best strategies to address the issues.

CONCLUSION

The use of the Cloud-based computing network remains an evolving challenge when accessing the information resources on the Internet anywhere and whenever. The technology has proved to be of value to the education community by continuing to deliver scalable, on-demand facilities. Resources can be used at any time and any venue and facilitate higher education and training. Few individuals in the education industry have committed to this new way of studying, but in industries such as organizations and people there is broader recognition. Nevertheless, studying using mobile devices is constrained in computing ability, storage space, hardware and software constraints, but it has significant benefits in terms of education connectivity and pedagogical system enhancement.

As previously stated, while some current work has looked into the advantages and drawbacks of cloud adoption, the study is mostly qualitative and is primarily focused on technological concerns. Further, there has been no earlier research on innovation adoption that takes into account the technical factors which affect the adoption of e-learning in education institutions centered on the cloud. The scientific weight of this research is evident to support previous results. Further for this research, it is very much important to analyze the gathered factors by conducting an empirical study which will involve most of stakeholders to measure the users' satisfaction and intention to use cloud-based e-learning technology.

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