

Examine online learning: The influence of cost readiness on Modern Education

Franklin Ore Areche

Professional School of Agroindustrial Engineering, National University of Huancavelica, Huancavelica – Peru

Received: 19 Apr 2022; Received in revised form: 08 May 2022; Accepted: 14 May 2022

©2022 The Author(s). Published by TheShillonga. This is an open access article under the CC BY license

(<https://creativecommons.org/licenses/by/4.0/>)

Abstract

The primary goal of this research is to examine and analyse the cost readiness factor as it relates to e-learning deployment. The study will look at the cost efficiency and cost readiness factors that influence the successful adoption of an e-learning system, and propose prospective and long-term solutions that would go a long way toward overcoming cost obstacles in the future. The researchers used a quantitative research method to determine the cost readiness of e-learning implementation. The participants in this study were 219 participants from several private universities. The results demonstrated that cost preparedness has a large predictive value for e-learning and will have a direct positive relationship with it. The survey questions may not necessarily generalize to the greater community of instructors and administrative personnel at private colleges, which is one of the study's limitations.

Keywords— Online learning, Higher Education, Cost, Modern Education.

I. INTRODUCTION

Many activities, including education, health care, agriculture, business, and military activities (Khan & Abdullah, 2019), have changed as a result of technological advancements (Mahona & Pacho, 2021). In today's globalized digital world (Khan & AAS, 2019), education, which includes both teaching and learning (Sohail & Nabaz, 2019), is viewed as a critical component for gaining a competitive advantage (Riyadh et al., 2020). Individuals and organizations are becoming more knowledge-intensive (Ahmed & Hassan, 2019) in order to acquire a competitive advantage (Paschal & Mkulu, 2020), allowing them to focus more on obtaining and maintaining information in order to obtain a considerable advantage (Khorsheed et al., 2020). To put it another way, technology improves educational standards; to say it another way (Sadq et al., 2020), learners can be more effective in their learning by using technological equipment (Mohammed et al., 2020). Universities that develop new technologies produce a more efficient learning atmosphere and learning environment (Mohammed et al., 2022). Since the 1950s, technology has played a significant role in the development of educational standards (Fatah et al., 2021). Since 1998, there has been an increase in interest in the use of technology in education (Abdalla Hamza, et al., 2021).

Individual connections, as well as connections between individuals and information (Riyadh et al. 2020), are critical

(Qader et al., 2021), but having the association is insufficient (Hamza et al., 2021). In the evolving context (Hamad et al., 2021), technology plays a role in assisting learners in whatever they choose to undertake (Harouache et al., 2021). Technology is flexible (Abdalla Hamza, et al., 2021), sensitive, and easily adjustable according to necessity in this environment (rzgar Ahmed & Sharif, 2018), and it no longer decides or constrains the options for action (Khan et al., 2019), like any other university (Khan & Zada, 2021), will provide an education in which students at all levels benefit from studying in a research environment (Darbandi, 2017), resulting in graduates who are well prepared for work, further education (Benedicto & Paschal, 2022), and making a valuable contribution to society (Sultan et al., 2020).

The conventional technique of teaching and learning in the classroom, in which both the teacher and the learner must be physically present in the same room (Sadq et al., 2020), was used in the past (Sadq et al., 2020). This is still the most prevalent technique of instruction, and it is used all around the world (Othman et al., 2020). However, internet technology appears to have rendered the traditional method of teaching obsolete (Majeed et al., 2021), and a number of academics have proposed that education through the use of information and communication technology tools, sometimes referred to as e-learning (Paschal & Mkulu, 2020), is the way of the future (Mohammed, 2021). E-

learning is defined as the practice of teaching and learning through the use of electronic equipment (Jamal, 2021), such as computers to view interactive learning films, electronic whiteboards for teaching, photo and video editing, and the use of sound during a presentation (Ismeal et al., 2021). As a result, watching instructive movies (Aziz et al., 2021), manipulating photos/videos, inserting audio for presentations (Sorguli et al., 2021), and using an interactive whiteboard are all examples of e-learning system implementations (Karem et al., 2021). It is generally supported by computer networks via a variety of channels (Sabir et al., 2021), including wireless and satellite systems, as well as mobile technology, such as cellular phones, laptops, and other mobile devices (Gardi et al., 2021).

II. RESEARCH PROBLEM AND AIM OF STUDY

Generally, the concept of e-learning is gradually gaining ground in most institutions around the world, some universities have started putting a lot of efforts and resources to embrace the e-learning system, which many scholars believe is the way of the future (Abdalla Hamza, et al., 2021). Despite this, researchers and other scholars believed that there is still a long way to go in order to actually achieve the level of development in adopting the e-learning system (Kadhim et al., 2021). There are some potential problems that need to be overcome so as to cross the line in implementing the e-learning system, these problems are but not limited to (Kangarluei et al., 2012):

- High cost of hardware devices and software programs needed to effectively implement the e-learning system;
- Poor internet access due to high cost which results in lower bandwidth speed;
- High import tariffs and less price completion;
- Poor condition of telecommunication infrastructure.

The problems listed above seems to be the cost readiness problem affecting the education sector as a whole; therefore (Hamad et al., 2021), this study will focus strictly on the cost readiness factor affecting e-learning implementing in private universities (Sultan et al., 2020).

The main aim of this study is to analyze and investigate cost readiness factor affecting the implementation of e-learning (Abdalla Hamza, et al., 2021). The research would investigate the cost efficiency factor that affects the successful implementation of the e-learning system, and come up with prospective and sustainable solutions (Sharif & Azeez, 2021), which would go a long way in overcoming

the cost barriers for future implementation (Dixit & Sharif, 20219).

III. LITERATURE REVIEW

There are several aspects involved in making decisions; we need to consider Advantages, disadvantages and costs involved (Sultan, 2021). The financial, managerial, operational, Should be considered in the choice of the most Efficient (Sultan, 2021). The Economy of the Costs initially was introduced by (Dixit & Sharif, 2020), with the publication of the work *The Nature of the Firm*, in which it investigated the reason of the existence of the (Qoitassi & Sharif, 2015). Management of costs is defined by (Sharif, 2017) as a branch of the accounting that defines questions of strategically costs that are moved in such a way by how much not financial information (Jamil et al., 2018). Therefore, the objective of the management of costs is to supply to conditions them companies to take decisions finally to increase the competitiveness of the company (Fallahi et al., 2019). Knowledge of costs is important for the survival of companies. Managers need knowledge about the costs of the organization (Rezaei et al., 2019). However, the organization must ensure that the sales price covers Costs and expenses of the product and that can generate a desired profit margin (Saleh & Jamil, 2017). A Cost System is the monetary parameterization of the production system of a company (Jamil & Mawlud, 2021). The Accounting of costs possess is an extreme importance when collecting, processing and to inform how the resources applied in the productive system of goods or services of affect the results of a company (Saleh & Jamil, 2021). For (Birdawod et al., 2018), cost is a sacrifice of resources, expenditure, a launching against the prescription in one determined countable period, generally with the objective of presentation of external financial reports. (Nithyanantham et al., 2019), cost is relative expense to or service used the well in the production of other goods or services (Paschal et al. 2022). As (Qasim et al., 2020), the accounting of costs is the branch of the accounting that if destines to produce information for the diverse management levels of an entity, with the intention of assisting the functions of determination of performance, planning and control of the operations and of taking of decisions (Alyousuf et al., 2020).

Technology can have a mutual relationship with learning. The emergence of recent technologies motive lecturers to leverage and understand these technologies for classroom use (Al-Yousuf et al., 2020); simultaneously, the on-the-ground implementation of those technologies in the classroom will directly impact on how these technologies continue to take shape. Technology is incorporates a large result, not simply on universities, however on the academic

community as an entire (Ahmed & Mohammed, 2019). Students have the benefit of learning to use technology tools to conduct analysis, to find data or to browse through digital libraries (Mohammed et al., 2018). Technology is in an efficient educational aid. In the current age (Alyousuf & Din, 2020), it along with its numerous tools and applications has become a lot of integrated within the learning method. This will play a vital role in enhancing this method and creating it active rather than passive (Mardan & Ahmed, 2017).

Information technology is a term usually used to describe the elements of hardware and software that permit individuals to access, retrieve, store, organize, manipulate and present information electronically (Kareem et al., 2022). Communication technology is a phrase utilized to describe telecommunications tools through that information are often sought (Wu et al., 2022), sent and accessed as an example, phone modems, faxes and computers. Information and communication technology (Cao et al., 2021) represents the convergence of information technology and communication technology (Qasim & Alyousuf, 2021). ICT is that the combination of networks, hardware and software as well as suggest that of communication, collaboration and engagement that enable the processing (Qasim & Alyousuf, 2021), management and exchange of knowledge, information and data (Mohammed & Ahmed, 2018). Information and communication has brought lots of potentials for academic modification (M Aziz, 2016). Learning has become easier and purposeful for students with the incorporation of ICT lecturers might differentiate (Ibrahim et al., 2020) learning directions and make student-centered learning utilizing computer technologies. ICT has also impacted the educational access (Prakash et al., 2020). With the advancement of technologies, schooling is often done anyplace and anytime (Manikandan et al., 2020). An incorporation of ICT in education has additionally played vital roles in getting ready individuals (Cao et al., 2022).

The use of ICT in education has revolutionized and remodelled the education sector worldwide and created positive impacts provided on implementation ways are followed (Balaji et al., 2019). Mohammed et al. (2018), define utilizing ICT in education includes the uses of technologies (Paschal et al. 2020) that allow students to receive information (Cao et al., 2022), communicate and exchange information with others in an academic environment. Educational systems around the world are getting increasingly pressured to use the new ICT tools to their curriculum to supply students with the information and skills that they have in the twenty first century (Fareed et al., 2021). The challenge that educational systems are encountering is a way to rework the curriculum and learning method to supply students with the requisite skills to operate

effectively in a very dynamic and endlessly changing environment (Khan et al., 2022). ICT provides powerful tools that will facilitate in transforming the current isolated, student-centered and text bound classrooms into wealthy, student focused interactive information environments (Sivaram et al., 2020). To fulfill these challenges, learning faculties or universities should incorporate the new technologies and applicable ICT tools for learning (HamaAliFaraj et al., 2017).

Furthermore, (Rashid et al., 2019) claimed that incorporating ICT into education can transform learning into a lot of student-centered learning in which students collaborate with one another to tackle tough learning tasks (Sharma et al., 2020). Integrating ICT into education necessitates lecturers' knowledge of a variety of constructivist pedagogies in order to change their traditional pedagogies. E-learning, according to Awasthi & Sharma, (2020), is a term that encompasses a variety of processes and applications (Gowsic et al., 2019), including distant learning, online learning, virtual learning, computer learning, web-based learning, and digital collaborations. E-learning is a hybrid of information technology and education, with each contributing to the transformation of how teaching and learning are carried out in the digital world. This entails innovative methods of accessing, learning (Sharma et al., 2019), or teaching, as well as the creation of learning materials and the delivery of learning content over the internet or other storage devices (Sharma & Ismail, 2022). Through the use of multimedia resources such as CD-ROMs, video, CDs, hypermedia, computer simulations, interactive whiteboards, and other tools, the responsibility for learning is shifting from the teacher to the student. The transition from teaching to learning has been a huge transformation in education. In fact, we live in a world that is centered on the learner. In his study on the essentials for e-learning, (Awasthi et al., 2019), the institutions in question debate the relevance of e-learning in connection to distance education. He also discussed the significance of e-learning as well as its historical context (Othman et al., 2018). Furthermore, he was able to pinpoint the critical effects of e-learning after it is fully implemented, which include (Ahmed et al., 2021):

- Eliminate the costs for instructor fees and materials to a certain level;
- Reduce time of learning and the time employee's absence from duty;
- Increased retention and enhanced hands-on application unlike traditional methods;
- Help manager instruction and progress via portal;
- Make easy use of multimedia in practice and assessment according to learners' abilities;

- Allow for automated monitor of user's progress with supervisor and teachers;
- Be highly interactive as it engages users and pushes them than pulling them to progress;
- Help fast learners study on their own pace in any course and avoid redundancy;
- Enable slow learners to also study in their own pace by eliminating frustration with themselves, their fellow learners, and the subject matter;
- Make knowledge cumulative as lessons are built consecutively and with flexibility;
- Make learning takes place anytime anywhere and greatly increases knowledge retention;
- Assist e-learners create, have access, view, modify and print or send documents;
- Enhance evaluation as it becomes self-paced since e-learning is a networked phenomenon;

Make easy delivery of content using standard internet technology as it enhances surf ability. E-learning supersedes training and instruction since it is a tool that improves behaviour performance (Sharma et al., 2022). According to Ali & Yahiya, (2018), the benefits of e-learning are many, which also include cost-effectiveness (Ali & Ebraheem, 2022), enhanced responsiveness to change, consistency, timely content, flexible accessibility and providing students value (Sharma et al., 2022). Sadq et al., (2018), in their study stated that the e-learning techniques that are adopted by many universities in the past are in the form of prepared lectures (Shareef et al., 2021), which are stored in external memory such as floppy diskettes, CD-ROMs that can be played as at when the need arises (Awdel et al., 2020). However (Saadi, 2021), this has been found to have slight disadvantage because of the ratio of students per computer system in which most of these facilities are not interactive enough when compared with the situation in which the lecture is conducted in real time over the internet (Saadi, 2021).

There are many various approaches and definitions to outline e-learning (Kareem, 2020). Some definitions are additional precise, especially regarding the technologies used, others just scratch the surface by providing a general concept of its means (Sohail & Dhuha, 2021). In this study chose a distinct assortment of definitions e-learning (Khan, 2021). The origin of the term e-learning is not certain, although it is recommended that the term most likely originated during the 1980's (Yaba et al., 2021). E-learning is an innovative approach to delivering electronically mediated, well designed, student-oriented, interactive e-learning environment, independent of the place and time, whether by utilizing internet or digital technologies

according to the educational styles principles (Mahmood et al., 2022).

According to Khan, (2021), e-learning is flexible and focusing on interaction among lecturers, students and the online environment and on collaborative learning by stating that e-learning is about connecting learners to other learners (Hassan & Ahmed, 2020), lecturers to professional support services and providing platforms for learning (Mohammed, 2019). The e-learning industry refers to the effective integration of a variety of technologies across all areas of learning (Sadq et al., 2020). E-learning technologies are designed to support learning by encompassing a variety of media, tools, and environments (Aziz et al., 2021). It enables for each synchronous and asynchronous learning environments. E-learning acts as a catalyst for authentic and purposeful learning experiences (Rashid, 2022). The emergence of e-learning, the fast growth of the internet and the advent of the (WWW) has created important impact on how information transfer and learning are conducted. E-learning is an outcome of the progression of distance education wherever digital technology is utilized within the teaching and learning method (Qader et al., 2021). The internet is a broadly used educational medium for each distance and face to face learning (Hamad et al., 2021).

E-learning is at the initial stage of development, the relevant theoretical research still need to be more improved. Through the analysis of domestic and international e-learning research, e-learning is a new teaching model that basically characterized by self-learning supported by information technology and centred by learners (Khan et al., 2020). This teaching mode re-orientates the teacher-student role of conventional teaching, to make an open self-teaching system learning environments (Mohammed, 2019). E-learning has its specific objectives and methods. It combines subjects of various disciplines with various supporting software that allow students (Mohammed, 2017), lecturers and administrators to arrange learning resources and conduct learning activities (Sharma & Kumar, 2021). E-learning provides services to students in educational institutions (Abdulsamad et al., 2022). Through the internet, students can access to libraries repeatedly a lot of comprehensive than libraries in their faculties or communities, and can be valid of information that is up-to-date, not found in their textbooks (Honarbakhsh et al., 2022), and may uncommon to their lecturer, interactions through emails are shown to be motivating factors for students to enhance their educational skills. Email also enables students to collaborate with individuals not physically exist (Sharma et al., 2022), over massive distances. The extent of e-learning technology use in course delivery varies wide. On the other hand, courses delivered primarily by lecturers in classroom setting with some

integration of technology. Several lie somewhere in between these two extremes also called blended learning (Khan, 2021).

E-learning should have the following three features (Qadir et al., 2021): collaboration, problem-based learning and authenticity (Mohammad, 2021). Collaboration means that students and lecturers solve problems through interaction (Sadq et al., 2020). Problem-based learning means that the student activities include the completion of work or research projects (Mohammed, 2019), instead of taking the exam, test. Authenticity means that all the course materials and activities are realistic, closely related with what are students interested in (Othman et al., 2020). E-learning refers to the utilization of information and technology to improve and support learning in teaching, including the delivery of content via electronic media like Web (Sadq et al., 2020), audio or video, satellite broadcast, interactive TV, radio, CD-ROM, and so on, that may be a new kind of education that aims to mix new technologies with conventional education (Mohammed, 2021). (Ismeal et al., 2021), define e-learning as the combination of learning process and the internet. He stated that the rapid development of Information and Communication Technology (ICT) (Hamad et al., 2021) and the power of the internet have enabled the world to turn into a small global village, where communication has become prominent in today's businesses (Abdalla Hamza, et al., 2021), and has also become the means of livelihood (Karem et al., 2021). (Hamza et al., 2021), stated that knowledge and information can be transferred easily by the use of information technology tools (Harouache et al., 2021). Therefore, there is the need to pay close attention to the way the educational sector has been revolutionized by the information technology (IT) through the internet. Similarly (Sharif & Azeez, 2021), defines e-learning as the type of learning that takes place with the use of computer and its related component (Khan & Abdullah, 2019). The learning process can be via online, through the internet or offline through CD-ROM and the learning process can be in the form of audio, visual, or audio-visual (Khan & Zada, 2021). (Majeed et al., 2021), highlights the concept of e-learning as the use of networked technologies that will enable the learning revolution possible, they stated that e-learning is playing a significant role in changing the way teaching and learning takes place. (Qadir et al., 2021) are in agreement with their belief that e-learning provides flexibility for learning process to be accessible to anyone, anytime and anywhere (Rashid, 2022). (Fatah et al., 2021), stated that e-learning provides a wide range of benefits and opportunities to teachers and learners (Qader et al., 2021). (Hamad et al., 2021), describes e-learning as a method of providing education with the use of computers and communication

technologies (Gardi et al., 2021), these technologies include but not limited to: the internet, computer networks, CD-ROM, Personal Digital Assistants (PDSs), mobile phones, projectors and other electronic devices that can be used to deliver teaching and learning (Abdalla Hamza, et al., 2021). Suleiman in his study on essentialities for e-learning in Nigeria's tertiary institutions stated that the relationship between technology and education has been in existence for quite a long time, and the e-learning is strategically a subset of technology in the area of education (Hamad et al., 2021). His study focused on the conceptual relevance of e-learning with regards to distance education (rzgar Ahmed & Sharif, 2018). Dixit & Sharif, (2020), in their study on e-learning and distance education highlight the prospects and challenges of e-learning.

They posit that e-learning has been used in developing education in many parts of the world; some institutions are using it to deliver distance education (DE) and lifelong learning (Qoitassi & Sharif, 2015). Many scholars described distance education as a method of teaching and learning where there is no physical contact between the teacher and the learner in which the medium of teaching ranges from print documents (Fallahi et al., 2019), CD-ROM, audio and video tapes to online facilities such as: internet, intranet/extranet, satellite TV, video conferencing (Saleh & Jamil, 2021), virtual classroom and web-based learning (Qasim et al., 2020). They also listed the benefits of e-learning to include; offering students a wide variety of learning opportunities (Ahmed & Mohammed, 2019), learning at convenient time and place, increased availability and different varieties of learning tools and resources, improved opportunities for individualized learning (Alyousuf & Din, 2020). As an increasing range of universities adopt e-learning strategies, their successes depend not solely on the availability of technology but as well on the extent to that university and students are supported as they explore and develop innovative ways in which to integrate technology into the learning experience (Cao et al., 2021). Pedagogic practices should be adapted, technical proficiency becomes a lot of necessary and reliable technical infrastructure should be maintained in order to use e-learning effectively (Mohammed & Ahmed, 2018). These demands translate into a host of new lecturers and student s support need that universities have to address (Mohammed et al., 2018).

Several factors make e-learning attractive to education institution and learners. As an example the provision of the internet implies that e-learning eliminates learning barriers of time and distance, whereas at the same time permitting students to take charge of their learning (Sivaram et al., 2020). Creating an e-learning experience involves serious commitment to understanding the various options of this

and the ways it can be used most advantageously to impact learning (Fareed et al., 2021). Khan et al., (2022) suggested that teaching methods utilized in traditional courses might have to be review if they are not transferable to e-learning environment (Rashid et al., 2019). Changing work patterns have translated into a lot of course preparation time and skills to run online courses (Gowsic et al., 2019). As a result the perceived increasing employment, mindset and also the lack of skills in some cases has resulted within the reluctance to adopt and use –learning (Sharma & Ismail, 2022). Students use the e-learning system for their learning purposes and lecturers use it for the purposes of coming up with and teaching courses, delivering materials and observance and administering the students’ activates and so on (Awasthi et al., 2019). Students are exposed to the front end while lecturers are at the back end and are expected to be technologically sound enough to handle the system (Othman et al., 2018). Therefore in the implementation process of e-learning system, teaching staff need to be focused clearly as they play a central role in the effectiveness of online delivery and it is not the technology but the instructional implementation of the technology that determines the effects on learning (Honarbakhsh et al., 2022). Changes in education have led to a paradigm shift from lecturers’ centeredness to learner centeredness through to subject centeredness (Sharma et al., 2022). This means that the lecturers can no longer able to make a decision what to be learnt but rather the interests of the learners do this and confirm how they need to learn it. It is so a learner-controlled, self-paced, education environment wherever the learners have authority over the convenience access and assessment (Saadi, 2021). HamaAliFaraj et al., (2017), pointed out three reasons for universities for investment in e-learning. Firstly these technologies increase the quality of course offerings. Secondly they enable courses to be delivered more efficiency and third they provide opportunities to teach new groups of students or existing students in more flexible ways (Mardan & Ahmed, 2017). Over the past decade, as elsewhere the main reason behind developed countries’ universities increasing investment in this area has been to enhance quality. The Open University

invests heavily in e-learning to improve the quality of its distance learning offerings. Imperial college invests in e-learning to improve the quality of its campus-based course. A secondary consideration has been to use opportunities to teach new group of students (Sultan, 2021).

Research Hypothesis: Cost factor is ready to implement e-learning in education sectors.

IV. METHODOLOGY

The study was carried out in private universities. The researchers employed quantitative research method to find the cost readiness in implementing e-learning. The questionnaire was distributed randomly among 700 academic and administrative staffs of private universities. The participants of the present study were 516 participants from different private universities. The questionnaire included of 15 items of cost readiness and 15 items of e-learning, all items evaluated by using five point Likert scale ranging from 1=Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree to 5= Strongly Agree. After the completion of data gathering, all data were examined by SPSS to find out cost readiness level of e-learning implementation.

Data Analysis

Table 1: Reliability analysis

Variables	Cronbach's Alpha	Number of items
Cost readiness	.806	15
e-learning	.878	15

Table 1 shows the reliability statistics for two variables; cost readiness as independent variable and e-learning as dependent variable. It was found that the Cronbach's Alpha for cost readiness = .806 > .6 this indicates that 15 items used for cost readiness were reliable, the Cronbach's Alpha for e-learning = .878 > .6 this indicates that 15 items used for e-learning were reliable for the current study.

Table 2: Correlations Analysis

Correlations

Items	Pearson Correlation	Cost readiness	e-learning
Cost readiness	Pearson Correlation	1	.677**
	Sig. (2-tailed)		.000
	N	516	516
E-learning	Pearson Correlation	.677**	1
	Sig. (2-tailed)	.000	
	N	516	516

** . Correlation is significant at the 0.01 level (2-tailed).

Table 2 presents the correlations between the scales using person correlation. Correlations analysis presents the values of the identified correlation tests; the researchers attempted to find the correlation between cost readiness as independent variable and e-learning as dependent variable.

According to correlation analysis, the researchers found that cost readiness has significant correlation ($r=.677^{**}$, $p<0.01$) with e-learning. Concerning the strength of the linear relationship is moderate between cost readiness and e-learning.

Table 3: Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.677 ^a	.459	.458	.45588

a. Predictors: (Constant), Cost readiness

Regression analysis is analyzing relationships among factors. $Y=f(x_1, x_2, \dots, x_c)$. Regression analysis is to estimate the how Y will influence and change X and predict. In this section the cost readiness as an independent variable and e-learning as a dependent variable. The e-learning's overall difference could be measured by its variance. The differences are measured as the sum of the square between participant's forecasted e-learning values and the total mean

divided by the number of participants. After division it will clarify variance by the total variance of e-learning, the researchers found that the amount or the number of total difference or variance that is accounted based on regression calculation. The number should vary between 0 -1 and is symbolized by R Square. Table 3 shows the value of R square = .677 this indicates that 68% of total variation in e-learning has been explained by cost readiness.

Table 4: ANOVA

ANOVA							
	Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	90.562	1	90.562	435.758	.000	
	Residual	106.822	514	.208			
	Total	197.384	515				
Dependent Variable: E-learning							
Predictors: (Constant), Cost readiness							

Table 4 explains F value for cost readiness as independent variable =435.758, since ($435.758 > 1$) this indicates there is a significant relation between cost readiness and e-learning.

Table 5: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.745	.152		4.897	.000
	Cost readiness	.802	.038	.677	20.875	.000

a. Dependent Variable: E-learning

A single regression analysis was used to find the relationship between cost readiness and e-learning. As

seen in Table 5 the result of research hypothesis, it was found that the cost readiness has significantly predicted

e-learning (Beta is weight .802, $p < .001$) this indicates that the cost readiness will have a direct positive association with e-learning.

V. DISCUSSIONS

This section concludes the findings and the analysis based on the research objective and purpose in order to give answer to the research question. The researchers were able to discuss in detail the concept of e-learning, its features and characteristics, the benefits and limitations. Taking into consideration all barriers to E-learning implementation are discovered and within each category of barrier are different critical factors. Research has pointed out critical barriers in e-learning system implementation, which lead to its failure during the implementation process hence negatively or positively affecting the students' achievement (Sharif, 2017).

This study concentrated on cost readiness as one of the critical barrier of implementing E-learning. The research is seeking for not only the cost readiness for implementing e-learning rather than whether implementing e-learning achievements are worth the cost (Jamil et al., 2018). One of the main benefits of implementing e-learning in private universities is to set a channel to achieve graduate degree. One of the essential concerns that private universities should take into consideration is the cost analysis. There are many thoughts and opinions regarding the cost readiness and cost effectiveness during implementing e-learning in education sectors. Among different concerns, the vital consideration the education sector utilizes to judge the financial performance of implementing e-learning is cost (Saleh & Jamil, 2017).

Whether education sectors are ready or not is essential information for additional decisions regarding the implementation of e-learning. This research is significant in that it reminds scholars or education practitioners of the significance of cost readiness of e-learning implementation which became an essential educational form of education field. However, the study is not limited to highlighting the significance of cost readiness of an e-learning implementation. It shows how the cost is ready for an electronic educational program. The finding revealed that private universities' budget and capital are ready for implementing e-learning to enhance students' academic achievement. It was found that the cost readiness has significantly predicted e-learning this indicates that the cost readiness will have a direct positive association with e-learning (Nithyanantham et al., 2019).

VI. CONCLUSIONS

The study aims to investigate the cost readiness of implementing e-learning. Many developing countries have implemented e-learning applications to deliver education to students through the Internet. As the population grows, several developing countries' education sectors try to facilitate sophisticated web sites by providing many features to perform in better way to help students. The finding revealed that an increase in readiness of cost should lead to increase in chance of implementing e-learning.

The student segment of online education system understands the benefits of the new process in its usefulness, and it is ease of use. The finding is significant for private universities in developing countries that desire to initiate e-learning for the purpose of improving and increasing the access to quality education at reasonable costs. It was found that the cost readiness has significantly predicted e-learning (Beta is weight .802, $p < .001$) this indicates that the cost readiness will have a direct positive association with e-learning.

VII. LIMITATIONS

The limitations of this study were that the survey questions may not necessarily generalize the larger population of teachers and administrative staffs of private universities, and the research question is not enough to show a clear association between cost readiness and e-learning implementation. Therefore, to expand and support the findings of the present study, it is recommended that follow-up studies be conducted, with larger sample size and a broader diversity of the sample groups included in the population.

REFERENCES

- [1] Mahona, P. & Pacho, T. (2021). Reshaping Education in the Post-COVID-19 Pandemic in Africa. *African Research Journal of Education and Social Sciences (ARJESS)*, 8(3), 13-26. <http://arjess.org/education-research/reshaping-education-in-the-post-covid-19-pandemic-in-africa.pdf>
- [2] Benedicto, G. & Paschal, M. J. (2022). Silence in everyday conversations amongst students: A Case of St. Augustine University of Tanzania. *Asian Journal of Language, Literature and Culture Studies*, 5(2), 33-40. Retrieved from <https://journalajl2c.com/index.php/AJL2C/article/view/30180>
- [3] Paschal, M. J. (2022). Investigating teachers' awareness of gifted children and resource accessibility for their learning in Tanzania. *Asian Journal of Education and Social Studies*, 27(4), 9-31. <https://doi.org/10.9734/ajess/2022/v27i430660>
- [4] Khan, S., & Abdullah, N. N. (2019). The impact of staff training and development on teachers'

- productivity. *Economics, Management and Sustainability*, 4(1), 37-45.
- [5] Khan, S., Sultan, A. A., & Alsamarai, S. (2019). Social media and its adverse effect on academic performance of students. *Bulletin of Social Informatics Theory and Application*, 3(1), 38-44.
- [6] Khan, S. I., & AAS, H. A. R. (2019). Academic Performance, Social Media Effects, and Learning of College Students: Evidence of Positive Influence in Erbil City. *Journal of Research on the Lepidoptera*, 50(4).
- [7] Sohail, I. K., & Dhuha, S. I. (2021). Study of outcome of Job rotation on performance by understanding the effect of multitasking and employee specialization on Job Rotation of employees from Manufacturing Industries. *Journal of Natural Remedies*, 21(10), 1.
- [8] Khan, S. I. (2021). Online classes amid the Covid-19 Pandemic: Parents Perspective. *European Journal of Molecular & Clinical Medicine*, 8(02), 2021.
- [9] Khan, S. I., & Zada, R. S. E. (2021). A Study about Financial Planning and Tax Saving Options for Primary and Secondary School Teachers of Nagpur Region. *Elementary Education Online*, 20(1), 2497-2502.
- [10] Khan, S. I., Ismael, D. S., & Zada, A. R. (2020). Drivers of customer satisfaction for mobile service provider in Maharashtra (India). *The Journal of Research on the Lepidoptera*, 51(1), 708-720.
- [11] Sohail, I. K., & Nabaz, N. A. (2019). The influence of social media on student's academic performance: a case study of Lebanese French University. *Ринкова економіка: сучасна теорія і практика управління*, (18, вип. 1), 38-56.
- [12] Khan, S. I. (2021). Impact of spirituality at workplace on organizational commitment in private banks of Nagpur, India. *Путеводитель предпринимателя*, 14(4), 184-189.
- [13] Khan, S. I. (2021). Communal support, work attitude, stress and job outcome across gender. *Management and Entrepreneurship: Trends of Development*, 3(17), 18-26.
- [14] Sohail, I. K., & Dhuha, S. I. A Study of Emotional Competence of Education, Telecommunication and Hospital Sector Employees in India. *Journal of Xi» an University of Architecture & Technology*, 2020, Vol. XII, Issue II, 5223-5233.
- [15] Paschal, M. J., Nyoni, T. T. & Mkulu, D. G. (2020). The Role of Cooperative Learning in Attaining Inclusive Learning in the Classroom, Creativity and Innovation in Secondary Schools in Mwanza Region – Tanzania. *International Journal of English Literature and Social Sciences*, (IJELS), 5(2). <http://journal-repository.com/index.php/ijels/article/view/1730>
- [16] Riyadh, H. A., Alfaiza, S. A., Khan, S. I., & Sultan, A. A. (2020). The Ugly Behind the Beauty of Corporate social Responsibility: A General Conceptual Perspective. *Journal of Research on the Lepidoptera*, 51(1), 750-758.
- [17] Khan, S. I., & Zada, R. Factor Influencing Consumers on Beguiling Craze of Online Shopping: A Study of Attitude in Nagpur City of Maharashtra (India).
- [18] Darbandi, H. (2017). THE STATE OF SUSTAINABLE TOURISM IN ERBIL. *QALAAI ZANIST SCIENTIFIC JOURNAL*, 2(3), 293-316.
- [19] Darbandi, H. The ability of management in developing tourism destination performance in Iraqi Kurdistan.
- [20] Sultan, A. A., Fbk, H. A., & Hosam Alden, R. (2020). Challenges and opportunities for adopting innovation in Iraqi SMEs. *International Journal of Psychosocial Rehabilitation*, 24(6), 7449-7456.
- [21] Yaba, T. K., Ahmed, A. K., & Hamad, K. Q. (2021). COVID-19'S Impact on Brand, Campaigning and Marketing Creativity: A Social Marketing Theoretical Approach. *QALAAI ZANIST SCIENTIFIC JOURNAL*, 6(4), 944-954.
- [22] Mahmood, S. S., Hamad, S. A., Hamad, K. J., & Ahmed, A. K. (2022). The Conformable Derivative Is Used to Solve a Fractional Differential Equation Analytically. *QALAAI ZANIST JOURNAL*, 7(1), 1050-1063.
- [23] Hassan, M. I., & Ahmed, A. K. (2020). A Proposal System Design of Evaluating Employees Performance in Qaladze Bank, Kurdistan Region of Iraq. *Journal of University of Raparin*, 7(4), 470-486.
- [24] Ahmed, A. K., & Hassan, M. I. (2019). THE ROLE OF INTERNAL ENVIRONMENT FACTORS IN IMPROVING EMPLOYEE PERFORMANCE. *Qalaa Zanjist Journal*, 4(4), 1071-1102.
- [25] Sadq, Z., Othman, B., & Mohammed, H. (2020). Attitudes of managers in the Iraqi Kurdistan region private banks towards the impact of knowledge management on organizational effectiveness. *Management Science Letters*, 10(8), 1835-1842.
- [26] Khorsheed, R. K., Abdulla, D. F., Othman, B. A., Mohammed, H. O., & Sadq, Z. M. (2020). The Role of Services Marketing Mix 7P's on Achieving Competitive Advantages (The Case of Paitaxt Technical Institute in Kurdistan Region of Iraq). *TEST Engineering and Management*, 83, 15947-15971.
- [27] Sadq, Z. M., Khorsheed, R. K., Mohammed, H. O., & Othman, B. (2020). The Effect of Administrative Leadership on Achieving Business Success Strategies (The Case of Lebanese French University). *International Journal of Advanced Science and Technology*, 29(2), 3095-3102.
- [28] Sadq, Z. M., Mohammed, H. O., Othman, B., & Saeed, V. S. (2020). Attitudes of Managers in the Knowledge Private University towards the impact of Human Capital in Achieving Competitive Advantages. *TEST Engineering and Management*, 82, 393-401.
- [29] Mohammed, H. O. (2019). The effect of motivation on employee productivity (A case study private bank in Kurdistan regional government). *Restaurant Business journal*, 11(118), 119-136.
- [30] Paschal, M. J. & Mkulu, D. G. (2020). The Contribution of Private Sector in the Provision of Higher Education in Tanzania: Challenges and Growth. *Journal of Humanities and Education Development (JHED)*, 2(3), 155-169.

- <http://www.theshillonga.comindex.php/jhed/article/view/91>
- [31] Othman, B., Harun, A., Sadq, Z. M., Rashid, W. N., Abdullah, K. M., Mohammed, H. O., & Faeq, D. K. (2020). Effects of Service Marketing Mix on Umrah Customer Satisfaction: Empirical Study on Umrah Traveling Industry in Malaysia. *TEST Engineering and Management*, 83, 22895-22909.
- [32] Mohammed, H. O., Aziz, A. I., Sadq, Z. M., & Othman, B. A. (2020). The Impact of Transformation Leadership on Employee's Effectiveness (The Case of Ministry of Higher Education and Scientific Research, Kurdistan Regional Government, Iraq). *International Journal of Multicultural and Multireligious Understanding*, 7(11), 201-217.
- [33] Mohammed, H. O. (2019). Relationship between participatory decision making and job satisfaction: a case study of private sector organizations in kurdistan-lfu. *Russian Journal of Agricultural and Socio-Economic Sciences*, 90(6).
- [34] Paschal, M. J. (2020). Responsive Classroom: Student's relationship and academic performance in Tanzania. Mauritius, LAP LAMBERT Academic Publishing
- [35] Sadq, Z. M., Ahmad, B. S., Faeq, D. K., & Muhammed, H. O. (2020). The Effect of Strategic Planning on Entrepreneurship Strategy Requirements (The Case of Private Hospitals in Iraqi Erbil City). *International Journal of Multicultural and Multireligious Understanding*, 7(10), 147-164.
- [36] Mohammed, H. O., Sadq, Z. M., Abdullah, N. N., & Arab, H. R. (2022). Role of Strategic Flexibility in Enhancing Innovation Performance From a Futuristic Perspective. *QALAAI ZANIST JOURNAL*, 7(1), 1064-1081.
- [37] Aziz, A. I., Mohammed, S. S., Muhammed, H. O., Sadq, Z. M., & Othman, B. A. (2021). The Gender-Biased Wording of Recruitment Advertisements in Iraq. *UKH Journal of Social Sciences*, 5(2), 25-33.
- [38] Majeed, H. L., Mohammed, H. O., & Qadir, B. M. (2021). The Role of Natural Gas in the Economic Diversity of the Kurdistan Region. *QALAAI ZANIST JOURNAL*, 6(3), 1065-1091.
- [39] Paschal, M. J. & Mkulu, D. G. (2020). Teacher- Students' Relationship and Students 'Academic Performance in Public Secondary Schools in Magu District, Tanzania. *Journal of Research in Education and Society*, 11(1), 20-3. <http://www.icidr.org/jresv11no1-content.php>.
- [40] Qadir, B. M., Mohammed, H. O., & Majeed, H. L. (2021). Evaluating the Petroleum Contracts of Kurdistan Region in the Surveying and Applying the Deloitte Data (A Comparative Review). *International Journal of Multicultural and Multireligious Understanding*, 8(7), 236-244.
- [41] Mohammed, H. O. (2021). The Role of Intellectual Capital on Competitive Advantage. *International Journal of Multicultural and Multireligious Understanding*, 8(7), 245-258.
- [42] Mohammed, H. O. (2017). *The effect of employee burnout on employee job satisfaction the case of Kurdistan telecommunication sector: Asiacell and Korek telecom* (Master's thesis, Sosyal Bilimler Enstitüsü).
- [43] Jamal, S. (2021). The impact of online learning on students: Evidence from Lebanese French University-Erbil. *International Journal of Research in Business and Social Science* (2147-4478), 10(3), 522-532.
- [44] Paschal, M. J., Pacho, O. T & Adewoyin, O. (2022). Teaching methods applied in higher education during COVID-19 pandemic in Africa. *International Journal of Educational Policy Research and Review*. 9(1)
- [45] Rashid, S. J. M. (2022). The Relationship Between Social Entrepreneurship, Corporate Social Responsibility and Organizational Performance in Social Economy Companies at Kurdistan Region of Iraq. *QALAAI ZANIST JOURNAL*, 7(1), 1019-1037.
- [46] Mohammad, S. (2021). Impact of Brand Loyalty on Customer Satisfaction (An Empirical Analysis of Clothing Brands). *Jamal, S. & Sultan, K.(2021). Impact of Brand Loyalty on Customer Satisfaction (An Empirical Analysis of Clothing Brands). Turkish Journal of Computer and Mathematics Education*, 12(10), 7085-7093.
- [47] Fatah, N. A., Hamad, H. A., & Qader, K. S. (2021). The Role of Internal Audit on Financial Performance Under IIA Standards: A Survey Study of Selected Iraqi Banks. *QALAAI ZANIST SCIENTIFIC JOURNAL*, 6(2), 1028-1048.
- [48] Ismeal, B., Mahmood Aziz, H., Sorguli, S., Qader, K., Sabir, B. Y., Abdalla Hamza, P., ... & Anwar, G. (2021). The Role of External Auditing in Reducing Creative Accounting Practices. *Sarhang and Qader, Khowanas and Sabir, Bawan Yassin and Abdalla Hamza, Pshdar and Gardi, Bayar and Anwar, Govand, The Role of External Auditing in Reducing Creative Accounting Practices (November 7, 2021)*.
- [49] Qader, K. S., Ismeal, B. A., Aziz, H. M., Hamza, P. A., Sorguli, S., Sabir, B. Y., ... & Gardi, B. (2021). The Effect of Human Resources Management Skills on Accounting Information Quality in Kurdistan Public Sector. *Journal of Humanities and Education Development (JHED)*, 3(3), 131-143.
- [50] Aziz, H. M., Sorguli, S., Hamza, P. A., Sabir, B. Y., Qader, K. S., Ismeal, B. A., ... & Gardi, B. (2021). Factors affecting International Finance Corporation. *Journal of Humanities and Education Development (JHED)*, 3(3), 148-157.
- [51] Hamad, K. Q., Qader, K. S., & Sharif, R. J. M. (2021). Effectiveness And Adequacy Of Disclosure Provisions In Tehran Stock Exchange. *PalArch's Journal of Archaeology of Egypt/Egyptology*, 18(08), 2379-2388.
- [52] Sorguli, S., Hamza, P. A., Ismeal, B. A., Sabir, B. Y., Aziz, H. M., Qader, K. S., ... & Gardi, B. (2021). Adaption of E-Filing of Income Tax Returns in Kurdistan.
- [53] Abdalla Hamza, P., Sabir, B. Y., Qader, K., Mahmood Aziz, H., Ismeal, B., Sorguli, S., ... & Anwar, G. (2021). Global financial markets: Factors influencing the global financial markets. *International Journal of Advanced Studies of Scientific Research*. 7(6).

- [54] Sabir, B. Y., Qader, K. S., Hamza, P. A., Ali, B., Ismeal, S. S., Aziz, H. M., ... & Anwar, G. (2021). Analysis of Accounting-Based Measures of Expected Returns: A Study of Private SME In Kurdistan.
- [55] Karem, L. E., Hamad, H. A., Bayz, H. A., Fatah, N. A., Ali, D. J., Ahmed, Z. N., ... & Qader, K. S. (2021). Corporate Governance And Its Effect On Firm Performance In An Emerging Economy. *International Journal of Environmental, Sustainability, and Social Science*, 2(3), 281-291.
- [56] Qader, K. S., Hamad, H. A., Gardi, B., Abdalla, P., Hamza, D., & Anwar, G. (2021). The role of sophisticated accounting system in organizational planning.
- [57] Hamad, H. A., Qader, K. S., Gardi, B., Abdalla, P., Hamza, D., & Anwar, G. (2021). The essential variables to consider before investing in financial markets during Covid-19.
- [58] Hamza, P. A., Hamad, H. A., Qader, K. S., Gardi, B., & Anwar, G. (2021). Management of outsourcing and its relationship with hotels' performance: An empirical analysis of selected hotels in Erbil. *International Journal of Advanced Engineering Research and Science*, 8, 10.
- [59] Gardi, B., Hamza, P. A., Qader, K. S., Anwar, H., Hamad, D., & Anwar, G. (2021). Factors affecting the quality of financial statements on investment decision making.
- [60] Harouache, A., Chen, G. K., Sarpin, N. B., & Majeed, N. (2021). Importance of green supply chain management in Algerian construction industry towards sustainable development. *Journal of Contemporary Issues in Business and Government Vol*, 27(1).
- [61] Kadhim, K. G., Harun, A., Hamawandy, N. M., Qader, K. S., Jamil, D. A., & Rashid, J. S. (2021). Communication of Corporate Social Responsibility and Loyalty of Customer's In Kuala Lumpur Hypermarket Industry. *Journal of Contemporary Issues in Business & Government*, 27(1).
- [62] Abdalla Hamza, P., Sabir, B. Y., Qader, K., Mahmood Aziz, H., Ismeal, B., Sorguli, S., ... & Anwar, G. (2021). Global financial markets: Factors influencing the global financial markets. *International Journal of Advanced Studies of Scientific Research*, 7(6).
- [63] Paschal, M. J. & Mkulu, D. G. (2020). Online Classes during COVID-19 Pandemic in Higher Learning Institutions in Africa. *Global Research in Higher Education* 3(3), 1-21. DOI: <https://doi.org/1022158/grhe.v3n3p1>
- [64] Abdalla Hamza, P., Sabir, B. Y., Qader, K., Mahmood Aziz, H., Ismeal, B., Sorguli, S., ... & Anwar, G. (2021). Global financial markets: Factors influencing the global financial markets. *International Journal of Advanced Studies of Scientific Research*, 7(6).
- [65] Abdalla Hamza, P., Gardi, B., Hamad, H., & Anwar, G. (2021). Analysis the impact of Information technology on Efficient tax Management. *Bayar and Hamad, Hawkar and Anwar, Govand, Analysis the impact of Information technology on Efficient tax Management (December 6, 2021)*.
- [66] Hamad, H. A., Hamza, P. A., Gardi, B., Saeed, K., Qader, D., & Anwar, G. (2021). The influence of accounting software in minimizing business costs.
- [67] Kangarluei, S. J., Motavasel, M., & Sharifi, R. M. (2012). The Effect of Off-balance Sheet Financing on Profitability and Leverage Ratios. *Editorial Note Words from the Board of Editor 2 Profile of Authors Included in this Number 3 Information for Contributors 5*, 5(1), 85.
- [68] Sultan, K., Ahmed, R. R., Jafar, R., Murtaza, M. M., & Gardi, B. (2020). Corporate financial policy and its impact on sustainable capital structure: empirical evidence from textile firms of pakistan. *Humanities & Social Science Review*, 149-158.
- [69] Hamad, K. Q., Qader, K. S., & Sharif, R. J. M. (2021). Effectiveness And Adequacy Of Disclosure Provisions In Tehran Stock Exchange. *PalArch's Journal of Archaeology of Egypt/Egyptology*, 18(08), 2379-2388.
- [70] Sharif, R. J. M., & Azeez, T. Y. (2021). A Comparison Of Ifrs And Us Gaap With Potential Effects On Investment Analysis. *PalArch's Journal of Archaeology of Egypt/Egyptology*, 18(4), 6177-6187.
- [71] Dixit, P., & Sharif, R. J. M. (2019). Analysis of CSR Impact on Private Sector Secondary School: A study in North and South Delhi (India). *Social Development and Security*, 9(6).
- [72] rzgar Ahmed, R., & Sharif, R. J. M. (2018). The Effect of Tuition Fees on University Applications and Attendance: Evidence from the Kurdistan Region private Universities. *Qalaai Zanist Scientific Journal*, 3(4), 812-836.
- [73] Sultan, K. (2021). A Piece of Education on Comparative Performance Study of Islamic Banking system and Commercial Banking system in Pakistan. *Turkish Journal of Computer and Mathematics Education (TURCOMAT)*, 12(10), 7074-7084.
- [74] Sultan, K. (2021). Human Capital as Competitive Advantage: Empirical Evidence from Entities of Pakistan. *Turkish Journal of Computer and Mathematics Education (TURCOMAT)*, 12(7), 2176-2184.
- [75] Dixit, P., & Sharif, R. J. M. (2020). Standard Taxation Gaps & Reforms: A Critical Review of Revenue Policies of Kurdistan Region of Iraq. *SRIWIJAYA INTERNATIONAL JOURNAL OF DYNAMIC ECONOMICS AND BUSINESS*, 3(4), 341-354.
- [76] Sharif, R. J. M. (2017). Motivational Factors that Influence Foreign Direct Investment in Kurdistan Region. *QALAAI ZANIST SCIENTIFIC JOURNAL*, 2(4), 312-325.
- [77] Qoitassi, K. M., & Sharif, R. J. M. (2015). The Usability of classroom Technologies in English Language Teaching and Learning (ELT & ELL). *ANGLISTICUM. Journal of the Association-Institute for English Language and American Studies*, 3(7), 46-59.
- [78] Fallahi, A., Jamil, D. I., Karimi, E. B., Baghi, V., & Gheshlagh, R. G. (2019). Prevalence of obstructive sleep apnea in patients with type 2 diabetes: A systematic review and meta-analysis. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*, 13(4), 2463-2468.

- [79] Rezaei, H., Jamil, D. I., Ebadi, A., & Gheshlagh, R. G. (2019). Psychometric properties of the persian version of the instrument for assessing cardiac patients' knowledge, attitude, and beliefs regarding heart attack. *International Cardiovascular Research Journal*, 13(2), 62-68.
- [80] Jamil, D. I., Saleh, D. M., & Rahim, A. G. (2018). Construction of New Standardized Attribute Control Chart based on defects per million opportunities. *QALAAI ZANIST SCIENTIFIC JOURNAL*, 3(3), 734-745.
- [81] Saleh, D. M., & Jamil, D. I. (2017). Construction Three Charts Based on Inter Quartile Range and Comparison of Efficiency with Three Charts Based on Range. *QALAAI ZANIST SCIENTIFIC JOURNAL*, 2(3), 317-329.
- [82] Jamil, D. I., & Mawlud, B. S. (2021). Gender in The Sustainable Development Goals in Kurdistan Region-Iraq. *QALAAI ZANIST SCIENTIFIC JOURNAL*, 6(4), 970-989.
- [83] Saleh, D. M., & Jamil, D. I. (2021). Construction X-Bar Chart for Quality Control Using of Robust (MAD) Estimator in Under Consideration Is Outlier with An Application. *QALAAI ZANIST SCIENTIFIC JOURNAL*, 6(3), 575-588.
- [84] Kadir, D. H., Saleh, D. M., & Jamil, D. I. Comparison between four Methods to Construction Number of Defectives Control Chart.
- [85] Birdawod, H. Q., Jamil, D. I., & Saleh, D. M. (2018). Comparison of Efficiency and Sensitivity between (Three Sigma, Six Sigma and Median Absolute Deviation) by using Xbar Control Chart. *QALAAI ZANIST SCIENTIFIC JOURNAL*, 3(2), 803-812.
- [86] Nithyanantham, V., Paulmony, R., & Hasan, S. R. (2019). Self-perspective of 21st century educators: a challenge in the globalised educational world. *International Journal of Educational Research Review*, 4(3), 325-333.
- [87] Qasim, A. J., Din, R., & Alyousuf, F. Q. A. (2020). Review on techniques and file formats of image compression. *Bulletin of Electrical Engineering and Informatics*, 9(2), 602-610.
- [88] Alyousuf, F. Q. A., Din, R., & Qasim, A. J. (2020). Analysis review on spatial and transform domain technique in digital steganography. *Bulletin of Electrical Engineering and Informatics*, 9(2), 573-581.
- [89] Al-Yousuf, F. Q. A., & Din, R. (2020). Review on secured data capabilities of cryptography, steganography, and watermarking domain. *Indonesian Journal of Electrical Engineering and Computer Science (IJEECS)*, 17(2), 1053-1059.
- [90] Ahmed, F. Q. A., & Mohammed, A. S. (2018). Enhancing The Data Security In Cloud Computing By Using New Encryption Method. *Qalaai Zanist Scientific Journal*, 3(1), 1011-1021.
- [91] Mohammed, A. S., Ahmed, F. Q. A., & Ibrahim, B. F. (2018). Modification of load balancing method in networks with wimax technology. *QALAAI ZANIST SCIENTIFIC JOURNAL*, 3(2), 791-802.
- [92] Alyousuf, F. Q. A., & Din, R. (2020). Analysis review on feature-based and word-rule based techniques in text steganography. *Bulletin of Electrical Engineering and Informatics*, 9(2), 764-770.
- [93] Mardan, F. N., & Ahmed, F. Q. (2017). A Paper Survey On The Impact Of (It) On The Quality Of Financial Data (Case Study Of Municipalities And Tourism Ministry In Kurdistan Region-Iraq). *Qalaai Zanist Scientific Journal*, 2(2), 51-57.
- [94] Kareem, S. W., Alyousuf, F. Q. A., Ahmad, K., Hawezi, R., & Awla, H. Q. (2022). Structure Learning of Bayesian Network: A Review. *QALAAI ZANIST JOURNAL*, 7(1), 956-975.
- [95] Wu, Z. Z., Xu, Y. P., Cheng, Z. L., Sun, H. W., Papari, B., Sajadi, S. S., & Qasim, F. (2022). Optimal placement and sizing of the virtual power plant constrained to flexible-renewable energy proving in the smart distribution network. *Sustainable Energy Technologies and Assessments*, 49, 101688.
- [96] Cao, Y., Dhahad, H. A., Mansir, I. B., ABo-Khalil, A. G., Alamri, S., Rajhi, A. A., ... & Qasim, F. (2021). Development of a combined system based on a PEMFC and hydrogen storage under different conditions equipped with an ejector cooling system. *International Journal of Hydrogen Energy*.
- [97] Qasim, A. J., & Alyousuf, F. Q. A. (2021). History of Image Digital Formats Using in Information Technology. *QALAAI ZANIST SCIENTIFIC JOURNAL*, 6(2), 1098-1112.
- [98] Mohammed, A. S., & Ahmed, F. Q. (2018). Study of video traffic In telecommunication systems for the purpose of service quality. *QALAAI ZANIST SCIENTIFIC JOURNAL*, 3(3), 665-673.
- [99] M Aziz, M. (2016). Determine the pH. of Soil by Using Neural Network Based on Soil's Colour. *International Journal of Advanced Research in Computer science and Software Engineering*, 6(11), 51-54.
- [100] Ibrahim, B. F., Toyacan, M., & Mawlood, H. A. (2020, January). A comprehensive survey on VANET broadcast protocols. In *2020 International Conference on Computation, Automation and Knowledge Management (ICCAKM)* (pp. 298-302). IEEE.
- [101] Prakash, M. V., Porkodi, V., Rajanarayanan, S., Khan, M., Ibrahim, B. F., & Sivaram, M. (2020, September). Improved Conservation of Energy in Fog IOT Services Using Machine Learning Model. In *2020 International Conference on Computing and Information Technology (ICCIT-1441)* (pp. 1-4). IEEE.
- [102] Manikandan, V., Gowsic, K., Prince, T., Umamaheswari, R., Ibrahim, B. F., & Sampathkumar, A. (2020, September). DRCNN-IDS Approach for Intelligent Intrusion Detection System. In *2020 International Conference on Computing and Information Technology (ICCIT-1441)* (pp. 1-4). IEEE.
- [103] Cao, Y., Dhahad, H. A., Togun, H., El-Shafay, A. S., Alamri, S., Rajhi, A. A., ... & Ibrahim, B. F. (2022). Development and transient performance analysis of a decentralized grid-connected smart energy system based on hybrid solar-geothermal resources; Techno-economic evaluation. *Sustainable Cities and Society*, 76, 103425.

- [104] Balaji, B. S., Rajkumar, R. S., & Ibrahim, B. F. (2019). Service profile based ontological system for selection and ranking of business process web services. *International Journal of Advanced Trends in Computer Science and Engineering*, 8, 18-22.
- [105] Mohammed, A. S., Ahmed, F. Q. A., & Ibrahim, B. F. (2018). Modification of load balancing method in networks with wimax technology. *QALAAI ZANIST SCIENTIFIC JOURNAL*, 3(2), 791-802.
- [106] Mohammed, A. S., Ahmed, F. Q. A., & Ibrahim, B. F. (2018). Modification of load balancing method in networks with wimax technology. *QALAAI ZANIST SCIENTIFIC JOURNAL*, 3(2), 791-802.
- [107] Cao, Y., Dhahad, H. A., Sharma, K., ABo-Khalil, A. G., El-Shafay, A. S., & Ibrahim, B. F. (2022). Comparative thermoeconomic and thermodynamic analyses and optimization of an innovative solar-driven trigeneration system with carbon dioxide and nitrous oxide working fluids. *Journal of Building Engineering*, 45, 103486.
- [108] Fareed, B., Toycan, M., & Mohammed, A. S. (2021). DTCR: delay time aware controlled rebroadcasting mechanism for intelligent transportation systems. *Soft Computing*, 25(18), 12537-12549.
- [109] Khan, M. N., Dhahad, H. A., Alamri, S., Anqi, A. E., Sharma, K., Mehrez, S., ... & Ibrahim, B. F. (2022). Air cooled lithium-ion battery with cylindrical cell in phase change material filled cavity of different shapes. *Journal of Energy Storage*, 50, 104573.
- [110] Sivaram, M., Rohini, R., Rajanarayanan, S., Maseleno, A., Mohammed, A. S., Fareed Ibrahim, B., & Goel, P. M. (2020). Efficient coverage greedy packet stateless routing in wireless sensor networks. *Measurement and Control*, 53(7-8), 1116-1121.
- [111] HamaAliFaraj, K., Ibrahim, B. F., & Salih, A. A. (2017). Distance Varieties Wireless Signals Relations Connected Peer to Peer Computers. *QALAAI ZANIST SCIENTIFIC JOURNAL*, 2(2), 189-203.
- [112] Rashid, T. A., Hassan, M. K., Mohammadi, M., & Fraser, K. (2019). Improvement of variant adaptable LSTM trained with metaheuristic algorithms for healthcare analysis. In *advanced classification techniques for healthcare analysis* (pp. 111-131). IGI Global.
- [113] Sharma, A., Awasthi, Y., & Kumar, S. (2020, October). The Role of Blockchain, AI and IoT for Smart Road Traffic Management System. In *2020 IEEE India Council International Subsections Conference (INDISCON)* (pp. 289-296). IEEE.
- [114] Awasthi, Y., & Sharma, A. (2020). Contrasting of Various Algorithmic Techniques to Solve Knapsack 0-1 Problem. *JOIV: International Journal on Informatics Visualization*, 4(1), 16-21.
- [115] Gowsic, K., Manikandan, V., Sharma, A., Sivaram, M., & Porkodi, V. (2019). Design of a Hybrid Logic Based A daboost Decision Tree Model for Identifying Web Attacks. *International Journal of Advanced Trends in Computer Science and Engineering*, 8(1.2), 52-58.
- [116] Sharma, A., Hussain, O., & Sharma, A. (2019). A Smarter Way to Improve Learning Outcome based on Computer Application. *International Journal of Innovative Research in Computer Science & Technology (IJIRCST)*, 7.
- [117] Sharma, A., & Ismail, Z. S. (2022). Weather Classification Model Performance: Using CNN, Keras-Tensor Flow. In *ITM Web of Conferences* (Vol. 42). EDP Sciences.
- [118] Sharma, A., Miran, A., & Ahmed, Z. R. (2022). The 3D Facemask Recognition: Minimization for Spreading COVID-19 and Enhance Security. In *ICT Analysis and Applications* (pp. 619-637). Springer, Singapore.
- [119] Sharma, A., & Kumar, S. (2021). Network Slicing and the Role of 5G in IoT Applications. In *Evolution of Software-Defined Networking Foundations for IoT and 5G Mobile Networks* (pp. 172-190). IGI Global.
- [120] Awasthi, Y., Sharma, A., & Pandey, R. (2019, November). Image Watermarking Using APDCBT in Selected Pixel Blocks. In *2019 8th International Conference System Modeling and Advancement in Research Trends (SMART)* (pp. 250-255). IEEE.
- [121] Othman, R. N., Alizadeh, F., & Sutherland, A. (2018, October). A novel approach for occluded ear recognition based on shape context. In *2018 International Conference on Advanced Science and Engineering (ICOASE)* (pp. 93-98). IEEE.
- [122] Ahmed, N. F., Omar, S. A., Othman, R. N., & Kakarash, Z. A. (2021). SQL Processor based on Intelligence Technique: Fuzzy Petri Net Database Applications. *Turkish Journal of Computer and Mathematics Education (TURCOMAT)*, 12(14), 1364-1371.
- [123] Abdulsamad, T., Kakarash, Z. A., Othman, R., Omar, S., & Ahmed, N. (2022). Distributed Resource Allocation Model with Presence of Multiple Jammer for Underwater Wireless Sensor Networks. *Iraqi Journal For Computer Science and Mathematics*, 3(1).
- [124] Omar, S. A., Othman, R. N., Ahmed, N. F., Ezat, H. S., & Kakarash, Z. A. EFFECTIVE DATA PARALLEL OPTIMIZATION FOR QUANTIFYING THE MATHEMATICAL MODEL OF SUBSYSTEMS IN MULTIVARIABLE SYSTEMS.
- [125] Ali, M. S., & Yahiya, T. A. (2018, October). Performance Analysis of Native Ipv4/Ipv6 Networks Compared to 6to4 Tunnelling Mechanism. In *2018 International Conference on Advanced Science and Engineering (ICOASE)* (pp. 250-255). IEEE.
- [126] Honarbakhsh, A., Tahmoures, M., Afzali, S. F., Khajehzadeh, M., & Ali, M. S. (2022). Remote sensing and relief data to predict soil saturated hydraulic conductivity in a calcareous watershed, Iran. *CATENA*, 212, 106046.
- [127] Ali, M. S., & Ebraheem, N. Q. (2021). Ways to Increase the Efficiency of Steganographic Use of Fractal Image Compression Algorithm. *QALAAI ZANIST SCIENTIFIC JOURNAL*, 6(4), 1013-1030.
- [128] qusay Ebraheem, N., & Ali, M. S. (2021). Features of Application of Data Compression Methods. *QALAAI ZANIST SCIENTIFIC JOURNAL*, 6(3), 969-983.
- [129] Sharma, A., Miran, A., & Ahmed, Z. R. (2022). Correction to: The 3D Facemask Recognition: Minimization for Spreading COVID-19 and Enhance Security. In *ICT*

- Analysis and Applications* (pp. C1-C1). Springer, Singapore.
- [130] Sharma, A., Miran, A., & Ahmed, Z. R. (2022). The 3D Facemask Recognition: Minimization for Spreading COVID-19 and Enhance Security. In *ICT Analysis and Applications* (pp. 619-637). Springer, Singapore.
- [131] Sadq, Z. M., Sabir, H. N., & Saeed, V. S. H. (2018). Analyzing the Amazon success strategies. *Journal of process management and new technologies*, 6(4).
- [132] Shareef, A. J., Saeed, B. R., & Sabir, H. N. (2021). Legal Regulation of The Civil Liability of The Air Carrier for Damages to The Goods. *QALAAI ZANIST SCIENTIFIC JOURNAL*, 6(2), 760-784.
- [133] Sabir, H. N., Sadq, Z. M., & Saeed, V. S. H. Electronic Commerce: Administrative and Legal Framework.
- [134] Awdel, Z. M., Odel, N. M., & Saadi, W. F. (2020). The rise of the globalization and its effect on the autonomy of state and political economy. *Journal of critical reviews*, 7(6), 998-1000.
- [135] Saadi, W. F. (2021). The New Generation of American Isolationists. *Annals of the Romanian Society for Cell Biology*, 19033-190
- [136] Saadi, W. F. (2021). The islamic republic of Iran's hegemony in Iraq, the cause, effect, and consequences. *QALAAI ZANIST SCIENTIFIC JOURNAL*, 6(3), 1-23.
- [137] Kareem, K. F. (2020). Methods and preventive measures for juveniles from committing a felony from an islamic perspective. *QALAAI ZANIST SCIENTIFIC JOURNAL*, 5(4), 428-448.