CLOUD COMPUTING ADOPTION IN UNIVERSITIES: INSTRUCTORS' PERCEPTIONS

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ABSTRACT

This study seeks to understand the perceptions of instructors towards the adoption of cloud computing in higher education. The study tends to answer the following: perceptions of instructors on cloud computing usage and any differences based on region, years of teaching experience, and relationship between SWOT and TOE frameworks. Independent t-test, one-way ANOVA, bivariate Pearson correlation were used to analyze data. 300 questionnaires were obtained from instructors in north part of Cyprus and north part of Iraq. This study was quantitative using causal comparative and correlational research designs. The results show that as general view instructors agree on cloud computing adoption. Although there exist differences in the sub-dimensions of SWOT and TOE with respect to regions, level of use and no differences were detected in the total for region and level of use. It was found out that concerning the perceptions of instructors towards the adoption of cloud computing with respect to region, instructors gave different views with respect to strength, weaknesses, and threat of cloud computing adoption. Instructors showed great optimism with respect to years of teaching experience in strength of cloud computing and showed great concerns prior to the weaknesses of cloud computing. The study shows that significant weak to moderate relationships exist between SWOT and TOE sub-dimensions.

Keywords: Cloud computing; cloud computing adoption; higher education; SWOT; TOE

ÖZET

Bu çalışma, yüksek öğretimde cloud computing kabulüne yönelik eğitmen düşüncelerini anlamak istiyor. bulut bilişim kullanımı ile ilgili eğitmenler ve bölgeye dayalı herhangi bir farklılıkları, SWOT ve TOE çerçeveler arasında öğretim deneyimi ve ilişkinin yıl algılamaları: Çalışma aşağıdaki cevap eğilimindedir. Bağımsız t-testi, tek yönlü ANOVA, iki değişkenli Pearson korelasyon verilerini analiz etmek için kullanılmıştır. 300 anket Kıbrıs'ın kuzey kesiminde ve Irak kuzey kesiminde eğitmenler elde edilmiştir. Bu çalışma nedensel karşılaştırmalı ve ilişkisel araştırma tasarımları kullanarak kantitatif oldu. Sonuçlar genel görünüm olarak eğitmenler cloud computing benimsenmesi üzerinde anlaşmaya olduğunu göstermektedir. bölgeler, kullanım seviyesi herhangi bir fark ile ilgili çalışmaları sürecinde alt boyutları hem ayak farklılıklar vardır, ancak bölge ve kullanım seviyesi, toplam tespit edilmiştir. Bölgenin göre cloud computing kabulüne yönelik eğitmen algıları ile ilgili, eğitmenler gücü, zayıflıkları ve bulut bilişim kabulü tehdidi ile ilgili farklı görüşler verdiği tespit edilmiştir. Ders cloud computing gücü öğretim deneyimi yıllara göre büyük bir iyimserlik gösterdi ve bulut bilişimin zayıf öncesinde büyük endişeleri gösterdi. Çalışma ılımlı ilişkileri zayıf önemli SWOT ve TOE alt boyutlar arasındaki mevcut olduğunu göstermektedir.

Anahtar Kelimeler: Bulut bilişimi; bulut bilişiminin benimsenmesi; SWOT(zincirin güçlü ve zayıf noktaları fırsatı); TOE(teknoloji kuruluş ortamı); yüksek öğretim

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LIST OF ABBREVIATIONS

ANOVA:	Analysis of Variance
APEX:	Oracle Application Express
APP:	Application
CIU:	Cyprus International University
CO:	Compatibility
CRM:	Customer Relationship Management
CX:	Complexity
DC:	Data Concern
DDoS:	Distributed Denial of Service
DOS:	Denial of Service
EC2:	Elastic Computing Cloud
EMU:	Eastern Mediterranean University
ERP:	Enterprise Resource Planning
GAU:	Girne American University
GR:	Government Regulation
HEL:	Higher Educational Institutions
IaaS:	Infrastructure as a Service
IBM:	International Business Machine
IDC:	International Data Corporation
IT:	Information Technology
JISC:	Joint Information Systems Committee
LEU:	Lefke European University

MS:	Management Support
NEU:	Near East University
OCC:	Opportunities of Cloud Computing
PaaS:	Platform as a Service
PC:	Personal Computer
PDA:	Personal Digital Assistant
RA:	Relative Advantage
ROI:	Return On Investment
SaaS:	Software as a Service
SCC:	Strengths of Cloud Computing
SD:	Standard Deviation
SOAP:	Simple Object Access Protocol
SoTL:	Scholarship of Teaching and Learning
SPSS:	Statistical Package for the Social Science
SQL:	Structured Query Language
SWOT:	Strengths Weaknesses Opportunities Threats
TCC:	Threats of Cloud Computing
TOE:	Technology Organization Environment
UK:	United Kingdom
USA:	United States of America
UTAUT:	Unified Theory of Acceptance and Use of Technology
VL:	Vender Lock in
WCC:	Weaknesses of Cloud Computing
WSDL:	Web Services Description Language

CHAPTER 1
INTRODUCTION

Cloud Computing (CC) is a type of Internet-based figuring that gives shared assets and preparing information to PCs and different gadgets as required. Gartner describes distributed computing as a style of processing in which adaptable and adaptable IT-enabled limits are passed on as an organization using the Internet development. As indicated by Jain and Pandey (2013) cloud computing can be seen as another computer worldview that allows clients to apply for the interim computer system, provided by the management as a cloud-processor may be one or greater level abstraction. Stats surveying organization IDC Cloud Computing for example characterized as raising very wide IT promotion, arrangement and conveyance model, empowering continuous conveyance of a control system and on the Internet. Establishing an educational framework in the cloud provides adaptability to understudies or employees to utilize the gateway to realize when helpful Likewise since the port is being held in the cloud it is constantly accessible by means of the Internet so any client can remotely found access to applications and utilized them to gain knowledge over the Internet. Knowledge cloud based framework in the cloud the capacity base is given as an administration on a compensation for each utilization (Seke, 2015). The capacity frameworks are exceedingly cutting edge and numerous reproduction information. Information reinforcement administrators are set up to take reinforcements consequently after some time. With every one of these applications advanced education frameworks have received a distributed computing has enhanced information reinforcement and recuperation techniques (Odeh et al 2015).

The cloud likewise gives savvy situations which designate different assets flexibly at run time. In cloud based advanced education frameworks, learning gathering is done in a repetitive and circulated way. This empowers the framework to change over to various assets as and when a specific server asset gets to be inaccessible. This usefulness of strength of a cloud-based framework gives the task a chance to be a savvy framework with inbuilt information building capacities (Abbadi and Martin, 2011).

The security of information in a cloud-based administration is specific concern. This is a

direct result of the absence of control by the administration supplier and due to the absence of data about the kind of security the administration supplier utilizes.

There are potential advantages of embracing the Cloud Computing model. It offers a movement from registering as an item that is claimed, to figuring as an administration that is conveyed to purchasers over the system from expansive scale server farms or mists (Abdollahzadehgan et al., 2013).

Distributed computing speaks to a late jump in the procurement of mechanical administrations. All the specialized viewpoints that were once made locally for every last business are given as various administrations on a chargeable premise. This mechanical movement makes outsider administration suppliers, who convey these administrations on a bigger scale and remotely benefits which guaranteed of seeing more successful. Different administrations, for example, the foundation and upkeep of programming situations, stockpiling, stages, handling, are given. Information that was beforehand kept under the purchaser's own organization, in his or her protected area, is removed and moved under the space of the administration supplier (Odeh et al., 2015).

Distributed computing administrations made accessible in the advanced education field guarantee to offer critical upgrades in adaptability and expanded spryness for clients, prompting more noteworthy quality for cash (Masud and Huang, 2012). In any Internet-based learning framework a standout amongst the most essential issues to locations is the adaptability and comfort of utilizing that framework. With distributed computing, any instructive association can expand its innovative base without compromising on capacity limit and specially appointed processing necessities (Abbadi and Martin, 2011). This is on account of distributed computing, seen most just as a gathering of top of the line PCs organized together, has the best potential to give computational and capacity assets as administrations (Madan et al., 2012). In this way, instructive establishments in both people in general and private segments can make utilization of these assets gave by cloud situations to broaden and convey cutting edge administrations to their own staff and understudies with less nearby assets and scarcely any additional interest in IT base inside the organization (Zia et al., 2014).Community learning and information sharing as extremely attractive results of distributed computing frameworks, a few electronic colleges have as of now secured their place, with multi-media and virtual classes on

learning-based study materials promptly accessible through their nearness in the cloud (Fernandez et al., 2012).

Additionally, the omnipresent way of distributed computing innovation empowers colleges with cloud administrations to acquaint their learning frameworks with understudies of creating nations where they don't have a physical nearness. In creating nations specifically, e-learning by means of distributed computing could raise the level of training, proficiency, and financial improvement where instruction is generally costly, open doors are constrained, and monetary variations exist (Okai et al., 2014).

There are potential advantages of receiving the Cloud Computing model. It offers a movement from processing as an item that is claimed, to registering as an administration that is conveyed to buyers over the system from expansive scale server farms or mists (Abdollahzadehgan et al., 2013).

Hazard components connected with such reception choice ought to be thought about before receiving this model. By and by, financial specialists attempt to lessen the level of danger and minimize vulnerability by either being danger loath while losing the potential advantages of this speculation or doing a watchful evaluation particularly in mission basic framework and business forms. Understanding advancement selection variables helps foundations investigate it in an organized methodology (Tashkandi and Al-Jabri, 2015).

Appraisal of specialized elements is insufficient at institutional level. Advancement ought to fit inside the setting of the organization and outer environment. Distributed computing prompts IT commoditizing (Sultan, 2010). Because of this contention, resistance is expected by Information innovation divisions inside foundations. Open distributed computing empowers information to be put away outside of the establishment. Administration supplier can be in an alternate nation or even an alternate mainland. This ought to raise diverse sorts of dangers identified with information protection and legitimate perspectives (Sultan, 2010).

There are a few shortcomings that ought not to be overlooked while particularly receiving distributed computing in advanced education.

One of the real shortcomings of cloud-based learning frameworks is the high reliance of the occupant on the administration supplier (Grandinetti, 2013). Since the whole

application, the capacity and nature itself are facilitated in the cloud, there is for all intents and purposes nothing the clients are in control of. Everything is reliant on the cloud administration supplier's system.

Different shortcomings are because of the specialized challenges that show up through conquering any hindrance between the customarily run and oversaw application when moving to a very propelled distributed computing administration. The application, databases and the network could however be tweaked to the processor with a specific end goal to maintain a strategic distance from a few if not these troubles (Odeh et al., 2015).

Different dangers, for example, Man-in-the-center and DoS (Denial of Service) can apply to both information in-travel furthermore information that is put away (Jamil and Zaki, 2011). Disseminated Denial of Service (DDoS) assaults, in which numerous hubs frameworks all assault one single hub in the meantime with a surge of messages, may bring about the entire framework to go down.

Lock-in or seller lock-in, is a method which guarantees that the client or inhabitant that needs to utilize a cloud administration should likewise utilize a specific outsider merchant administration. A portion of the cloud administration suppliers even force a confinement on the kind of programming; application; and equipment to be utilized to make utilization of their administrations. In addition, these sorts of administrations additionally convey overwhelming exchanging costs between contending merchants. For instance, Google utilizes Big-Table for capacity where Facebook utilizes Cassandra and Amazon utilizes Dynamo (Okai et al., 2014). Since there is no normal interface between these databases, relocation between them is either impractical or is entirely unreasonable.

The distinctions in information protection laws are of real criticalness for cloud computing suppliers trying to serve clients in numerous nations. Cloud computing suppliers may need to gather individual information from clients so as to serve them. For instance, a cloud-based travel booking site for workers may store individual data about the clients, for example, their full names and addresses. Suppliers may likewise store or process individual information identifying with their clients. For instance, a cloud-based client relationship administration database is liable to contain contact data or other individual insights about the customer company's clients. Cloud suppliers must guarantee that information stockpiling and handling consents to laws in every applicable ward, and

this can turn out to be much more confounded when information are put away and prepared all around, not simply in the cloud supplier's nation of origin or the client's nation of origin. At times, this multifaceted nature may restrain a supplier's capacity to work together in different markets (Berry and Reisman, 2012).

1.1 The Problem

According to Tashkandi and Al-Jabri (2015) cloud computing is regarded in 2014 as among one of the top trending strategic innovation and it is also regarded as one of the novel field of study under CIS/MIS department. In spite of the fact that cloud computing applications have been used by high education institutes over the years, cloud computing technology is rapidly growing into an interesting tool for data exchange and storage. This thesis intends to investigate adoption of cloud computing by universities in Northern Cyprus and Northern Iraq, with the involvement of instructors members to identify the current status and to see if there is a need to introduce cloud computing into the teaching curriculum most important to know to what extent instructors members from various universities in both countries are using or aware of cloud computing and see if there a great need to recommend its introduction to the educational systems of both countries by combining TOE (Technology-Organization-Environment) and SWOT(Strengths/Weaknesses/Opportunities/Threats) analysis frameworks to identify not only internal but also external capabilities of the Higher Education Institutions as well. It is important to use SWOT and TOE, because to assess the strengths, weaknesses, relative advantages, government regulation, privacy concerns, etc., which the higher education will institute to firmly understand cloud computing core advantages and limitations.

1.2 The Aim of the Study

This thesis seeks to understand the perceptions of instructors towards cloud computing adoption in universities, and to achieve this main aim, there is need to achieve these following research questions below:

1. What are the instructors' perceptions about the current status of cloud computing adoption by universities of Northern Cyprus and Northern Iraq?
2. Is there any difference in the perceptions of instructors on cloud computing adoption with respect to region (Northern Iraq and Northern Cyprus)?
   2.1. Is there any difference in the sub-dimensions (SWOT and TOE)?
   2.2. Is there any difference on the total (SWOT and TOE separately)?
3. Is there a difference in the perceptions of instructors on cloud computing adoption with respect to level of use of cloud computing services at their institution?
   3.1. Is there any difference in the sub-dimensions (SWOT and TOE)?
   3.2. Is there any difference on the total (SWOT and TOE separately)?
4. Is there a difference in the perceptions of instructors with respect to years of teaching experience
   4.1. Is there any difference in the sub-dimensions of (SWOT and TOE)?
   4.2. Is there any difference on the total (SWOT and TOE separately)?
5. Is there any relation among SWOT and TOE sub-dimensions of the perceptions of instructors?

1.3 Importance of Study

This study is very important because it's one of its kinds in the both countries, the study intends to consider it at faculty level because to know to what extent these instructors are using cloud computing. It is important since up to date, no study has been identified using the integration of the TOE and SWOT analysis frameworks together. SWOT framework helps to investigate both the internal elements (such as; strength and weaknesses) and the external elements (such as; opportunities and threat) of cloud computing and TOE tries to look at the external elements from the technical aspect of cloud computing, to the environmental factors and also to the policy aspect of cloud computing adoption. It is important to use SWOT and TOE, because to assess the strengths, weaknesses, relative advantages, government regulation, privacy concerns, etc., which will help the higher education institute to firmly understand cloud computing core advantages and limitations.

1.4 Limitation of the Study

The limitations of the study:

i. This thesis is only restricted to instructors of univerisities.
ii. The thesis time is a noteworthy restriction as in the event that this study will be done again later on, the impression of the educators will be changed towards cloud computing adoption, the data were collected in Spring 2016 semester.
iii. Non random sampling methods was used to collect data.
iv. Questionnaire was used to collect data

1.5 Overview of the Study

Chapter 1 gives insights about the general presentation cloud computing, the issue definition, the hugeness of the study, the point of the study, the constraint of this study and above all the breakdown of this study.

Chapter 2 introduces the related exploration take a shot at cloud computing, cloud computing in advanced education, Technology association structure.

Chapter 3 presents the hypothetical system whereby different parts of cloud computing in higher instructive foundations, administration model in cloud computing, arrangement model in cloud computing, Benefits of programming as an administration in advanced education, and so on, were examined.

Chapter 4 gives an outline about the exploration system, in which the examination demonstrate, the members, the information accumulation process and the instrumentation utilized as a part of the examination, information investigation strategies utilized, and the information gathering method was talked about.

Chapter 5 is the area where the outcomes and examination were talked about in points of interest.

Chapter 6 specifies the finish of the whole research study and proposals of the proposition, recommendations, and for future studies.

CHAPTER 2

RELATED RESEARCH

2.1 Cloud Computing

Despite the fact that colleges have been utilizing "cloud-based" applications for quite a long time (e.g. email), the cloud computing style is rapidly advancing into a premium model for information stockpiling and trade. As per Gartner an innovation research organization, more than 50 percent of Global 1000 organizations are anticipated to store classified information in the general population cloud before the end of 2016. The cloud is substantiating itself as being (a) tech arranged that is staying put. This is chiefly as a consequence of another type of understudies with taking in necessities incomprehensibly not quite the same as their forerunners. What's more, it is progressively perceived that powerful utilization of innovation in advanced education is crucial to giving brilliant instruction and planning understudies for the difficulties of the 21stcentury as underscored by (Masud et al., 2012). It is additionally critical to note that, in numerous innovation fields, advanced education shows two practices. With respect to systems administration and superior computing, advanced education appreciates notoriety for being a trailblazer. Be that as it may, then again, as contended by (Katz et al, 2009), advanced education is a relative late adopter in the applications and IT bolster field. Higher instructive organizations contend that receiving the most recent advances and arrangements is fundamental to staying focused and holding understudies. These understudies, known as "advanced locals" (Prensky, 2001), the "Net Generation", "Era Y", or even "Millennials", have not known a world without the Internet (Oblinger and Oblinger, 2005). Through projects and social discussions, for example, Twitter, Yahoo, Gmail etc., understudies as of now are knowledgeable with and are continuous purchasers of cloud-based advances (Ercan, 2010). In any case, in sharp difference to this diminishing in accessible subsidizing for IT administrations and bolster, Cloud computing can really help establishments decrease high consumptions on equipment, programming and IT upkeep. Cloud computing gives organizations a brought together,

virtual server farm that is available, for instance to staff and affirmations work force whenever and any area (Seke, 2015).Different analysts have characterized cloud computing in an unexpected way. A few schools of thought are about the supposition that cloud is an advancement of different computing assets and advances at various times, joined to convey new potential outcomes through rapid web works. Another school of thought trusts that cloud computing is another worldview with new advances, for example, virtualization. Definitions have likewise been proposed in light of versatility and flexibility, capacity to be conveyed and got to progressively and cost contemplations (Ewuzie and Usoro, 2012). The term cloud computing portrays a sort of parallel and circulated framework comprising of a gathering of between associated and virtualized PCs that are progressively provisioned and introduced as one or more brought together computing resource(s) in view of administration level assentions set up through transactions between the administration supplier and shoppers (Buyya et al., 2009). These ideas move the area of this foundation to the system to lessen the expense connected with administration of equipment and programming in light of the fact that the calculation happens on remote servers (Vaqero et al., 2009). Cloud computing is a membership based administration where clients can get diverse sorts of administrations: storage room, preparing, and organizing assets. The cloud makes it conceivable to get to customers 'information from anyplace whenever. While a conventional PC setup requires the same area for both the clients and the information stockpiling gadget, the cloud expels that need. Cloud computing advancements dispense with the need a physical area with the end goal of information stockpiling (Huth and Cebula, 2011). McDonald et al. (2010) have played out an inside and out investigation and elaboration with respect to the execution of the cloud environment in advanced education foundations. The goals of their exploration were: to amend the estimations of the natural expenses and advantages of cloud computing; to examine diverse ecological effects that cloud computing has for institutional exercises which are not research; to propose changes inside institutional administration and promoter strategies which would implement the utilization of cloud computing, and to make suggestions to the Joint Information Systems Committee for further enhancements. They investigated the utilization of cloud computing in UK advanced education establishments in the period 2008/09. This examinations showed that

the organizations had exceptionally direct utilization of cloud administrations set up (fundamentally understudy letter drops), however that the foundations had clear goals to enhance that state and to supplant the current IT base with cloud-based arrangements. McDonald et al. (2010) demonstrated that this methodology would convey a critical number of advantages to the establishments (moderating vitality, saving money on labor and support). They created 4 not so distant future situations for the utilization of cloud computing in advanced education: Cloud Workspace, Large-scale Cloud Storage, Cloud-Enabled Learning (both virtual and individual) and the Academic Cloud Scenario. Their suggestions were given to the JISC keeping in mind the end goal to quicken the procedure of cloud appropriation in HE establishments. Hussein et al. (2013) give a unique depiction of the movement of an IT framework from an organization's in-house datacenter to Amazon's cloud arrangement EC2. They investigated the relocation of a UK-based partnership that offers IT administrations to the oil and gas industry. The money related and specialized issues were liable to examination, and the information acquired can serve as direction for other comparative cases. The study recognized the advantages and downsides connected with the relocation and its effect upon the organization's whole staff body. The exploration depicted every one of the strides required for the movement procedure (cost examination, recognizing partners, sway investigation, lastly, and the database relocation). After effective movement, the accompanying advantages were recognized: decreased costs, the capacity to oversee salary and costs, the capacity to offer new administrations, a chance for the organization's development, shirking of monotonous work, and so forth. The accompanying downsides (dangers) were likewise distinguished: reliance on an outsider, issues with the acknowledgment of the new innovation, halfway lay-off of staff, diminished fulfillment, security concerns and so on. The selection of cloud administrations in advanced education foundations is expounded in the book "Tower and the Cloud", altered by (Katz, 2010). Diverse creators expand on a few points, for example, advanced education and Information Technology; globalization of advanced education; IT administration; open data, open source, open substance; grant in the cloudy world. The creators reasoned that today's classroom instruction has been enlarged and supplanted by web learning. Later on, the lines amongst foundations and associations will blur, as will the lines amongst

customers and administration suppliers, and amongst learners and teachers. Also, better approaches for information, more innovative stages for learning, and better methods for comprehension the new innovation will make new open doors for every dynamic member in the instructive procedure. Jensen et al. (2009) explored diverse security dangers: cloud malware infusion, metadata caricaturing assaults, flooding assaults, immediate and roundabout foreswearing of administration (DOS), and so on. For the cloud malware assault, the aggressor will first make its own administration on the Cloud (e.g. Programming as a Service, or Platform as a Service). The aggressor then malevolently endeavors to persuade the cloud supplier that the new administration is a legitimate offering for a given association. At the point when the real clients request specific cloud administrations, they will be re-coordinated towards the fake ones. A conceivable resistance against this assault is to check the honesty of the administration preceding its dispatch and dispersion to its last proposed clients. The metadata satirizing assaults depend on web-administration malware charges. On the off chance that the Cloud framework comprises of a WSDL store, changing the administration summons orders will bring about wrong (unsafe) SOAP messages. The creators inferred that in spite of the fact that these sorts of security dangers are not kidding; cautious arranging can prompt dodging them. The issue of protection has been considered in the exploration of (Pearson, 2009). In this day and age, the client's security is constantly under assault, and clients' close to home information is for all time hampered by huge promoting merchants. Diverse sorts of data ought to be secured (covered up) from un-approved use, for example, individual information, corporate information, touchy information, computerized content, use information, and programming arrangement information. In cloud computing, a few security dangers can happen: spillage of individual information, interruption of corporate strategies and techniques, risk and validity attentiveness toward the cloud suppliers, rebelliousness and capacity creep for the application suppliers and so on. Pearson states that security is an essential issue in the outline of cloud administrations, and he recommends a few measures to guarantee security assurance as takes after: transparency– the cloud supplier needs to illuminate the clients which information will be gathered; decision – the client ought to choose independent from anyone else whether to give his information or not; reason – the information ought to be

utilized just for the particular reason for which it is gathered; reviewing – the cloud supplier needs to designate a devoted individual to deal with the client's information and protection issues. At last, Hosseini et al. (2011) accentuate diverse sorts of dangers to which the cloud is open:

- Deterioration of client care and administration quality.
- Decrease in fulfillment.
- Departmental scaling down.
- Uncertainty about new innovation.
- Lack of supporting assets.

In synopsis, their outcomes delineate that while budgetary and mechanical issues are surely imperative, authoritative perspectives ought to likewise be considered. These ought to be considered particularly from the perspective of administration quality and client care, while likewise considering authoritative structure and the ramifications of being intensely reliant on an outsider for giving clients an item or administration. Cloud computing could be seen as a shabby and advantageous alternative for handling a lot of data in schools and colleges. As indicated by Wang and Xing (2011) the broad utilization of cloud computing applications in instruction informatization will give answers for the conveyance of instructive assets, and expansion the capacity to share data. A four-phase procedure of systems for the reception of cloud computing in advanced education has been recommended by (Meanwhile et al., 2011). These four phases are 1) Developing learning, practicality, and an underlying arrangement for cloud computing, 2) Evaluating the present framework and trying different things with how the framework changes with the utilization of the cloud, 3) Choosing the right cloud computing arrangement, and 4) Implementation and administration of an answer. Every single stage ought to be performed with various procedures to make the relocation or the move simple and less inclined to blunder. Cloud Computing model was developed from a few advancements. The model is a development of virtualization, Grid Computing, Utility Computing, Web administrations and Internet. Rapid remote system, minimal effort broadband and Low stockpiling and HW cost had added to the improvement of cloud computing (Alabbadi, 2011).

Cloud Computing is more than an outsourcing. As indicated by the definition, there are

five key attributes that recognize cloud computing from an outsourcing (Karla et al., 2010). A few business Software as a Service cloud administrations are accessible in the business sector today. This incorporates email administrations, CRM Salesforce, GoogleApps and ERP frameworks (Kalpeyeva and Mustafina, 2013; Taweel, 2012). Cloud computing merchants are likewise focusing on the advanced education section (Mircea and Andreescu, 2011).

2.2 Cloud Computing Utilization in Universities

A few cloud computing organizations target instructive establishments. Our goal is not to cover all administrations accessible in the business sector in this connection. Notwithstanding, the goal is to have an outline about the offering in the business sector that can be utilized by advanced education organizations. A few organizations offer projects for instructive foundations. Case of these projects is Microsoft Live@edu (Alshwaier et al., 2012).

This administration has been changed to Microsoft Office 365 as of late. It incorporates Word, Excel, PowerPoint, Outlook, OneNote, Publisher, and Access. The offer incorporates shared coordinated effort stockpiling in the cloud to permit sharing reports among understudies in their activities (Microsoft, 2014).

Google additionally gives a project to instruction through its Google Apps for Education Suite. This suite incorporates efficiency applications, for example, Google Docs. The suite incorporates email administration, classroom administration framework, shared capacity spoke to by Google Drive, site creation and facilitating, and coordinated effort instruments (Google, 2014).

A contextual investigation in the University of Westminster demonstrated the advantages and sparing achieved by utilizing Google Apps administrations by the college. The main role of this administration is to utilize email, cooperation and capacity administrations of Google Apps for non-touchy data.

An expected sparing of £1,000,000 was perceived. (Sultan, 2010) IBM Cloud Academy is a group cloud computing program. It gives best practices and conference administrations notwithstanding the cloud arrangements offered to advanced education establishments.

These arrangements incorporate cooperation arrangements, framework computing, combination arrangements, virtual desktops arrangements ... and so on (IBM, 2014).

Proficiency element was perceived by particular advanced education organizations that received cloud computing. Effectiveness was accomplished by Washington State University by receiving a virtualization situation which is viewed as an empowering agent for cloud computing. Sparing was perceived by utilizing Google Apps email administrations. Cloud computing was likewise utilized by various advanced education foundations in poor African nations, for example, Nairobi, Ethiopia and Rwanda (Sultan, 2010). Discover source that why it is imperative to examine receiving cloud computing in universities.

2.3 Regions Based Differences in Cloud Computing Adoption

Kim et al. (2012) reported that cloud computing is a noteworthy territory of enthusiasm for data technology, which offers the likelihood of green IT usage by diminishing working expenses and carbon discharges. Other benefits of cloud computing are scalability, flexibility, reliability and high performance. Numerous nations, for example, the USA, UK, Japan, and Germany, have acquainted and utilized cloud computing with their IT foundation. Be that as it may, cloud computing adoption in South Korea is still in the early stages contrasted with such nations. Their paper showed an investigation of the present acceptance status of cloud computing in the USA, UK, and South Korea to look for a few headings for the presentation of cloud computing advancements in Korean government organizations and open establishments.

As indicated by Poniatowski (2009) a few nations, for example, the UK, Germany, USA, and Japan, have additionally effectively received cloud computing in different IT organizations to recognize new development regions.

Hailu (2012) alluded to that selection of new innovation has ensnaring sections both from the decision, furthermore fundamental authority criteria and methodology. Yet new innovation, for instance, cloud computing gives unprecedented focal points especially to the making countries, it has challenges that may tangle the determination decision and following reception process. Their study gives a cognizance the reasons why information

innovation (IT) pioneers in making countries grasp new innovation by surveying their impression of the security reasonability, various leveled need, steadfast quality, and cost-sufficiency of cloud-computing innovation. Their study was coordinated as a quantitative examination with an acknowledged review instrument. Their result exhibits that impression of security feasibility, need, enduring quality, and cost-ampleness relate positively with IT pioneers in making countries availability to recommend cloud-computing progressions. From this study, recommendations will key accomplices and methodology makers in these countries. For a business social occasion of individuals, their study may give specific thoughts in undertaking innovation trade coordinated effort with a making country associate. For technique makers, the study may highlight the need to decrease the impediments to empower viable innovation trade investment and set up more imperative agreeable energies between made countries. For others, the study will give encounters into the way innovation appropriation decisions made and consider that may affect the innovation reception handle past those that are known and recognized innovation determination criteria.

2.4 Level of Using Cloud Based Services and Perceptions about Cloud Computing Adoption

Behrend et al. (2010) expressed that Cloud computing is picking up ubiquity in advanced education settings, however the expenses and advantages of this instrument have gone to a great extent unexplored. The motivation behind their study was to look at the elements that prompt technology adoption in an advanced education setting. In particular, they analyzed a scope of indicators and results identifying with the acknowledgment of a cloud computing stage in country and urban junior colleges. Drawing from the Technology Acceptance Model, they expand on the writing by inspecting both the real utilization and future aims; further, we test the immediate and roundabout impacts of a scope of indicators on these results. Around 750 junior college students enlisted in essential computing aptitudes courses took part in this study; discoveries showed that foundation qualities, for example, the student's capacity to go to grounds had impacted the convenience observations, while usability was to a great extent dictated by direct encounters with the stage, and teacher support. They offer proposals for junior college

chairmen and other people who try to fuse cloud computing in advanced education settings.

Miller (2008) listed user advantages of cloud computing: With cloud computing clients don't need to deal with overhauling programming to more up to date forms yet the most current rendition is constantly accessible. The client can have a boundless memory limit on the cloud, and the information is naturally secured and reinforcements are dealt with. With cloud arrangements the clients do no more face similarity issues with various working frameworks, diverse record organizations or programming forms. At the point when a client's records are put away in the cloud, the client has general access to the information anyplace and dependably has the most recent adaptation nearby. Client terminals can be more unassuming and less expensive than today as they need less neighborhood preparing force and capacity.

The potential and efficiency of using cloud computing as a piece of cutting edge instruction has been seen by various universities among which we determine University of California, Washington State University's School of Electrical Engineering and Computer Science, propelled training associations from UK, Africa (Sultan, 2010), U.S and others. Cloud computing offers to schools the probability of concentrating more on teaching and research practices rather than on complex IT plan and programming systems (McCrea, 2009), through a snappy IT execution. As demonstrated by Tout et al. (2009) multifaceted nature can be diminished with cloud computing.

Also, cloud courses of action can be used to reinforce pleasant learning and socially arranged theories of learning, using PC advancements to support communitarian procedures for rule (Thorsteinsson et al., 2010). Cloud computing offers various favorable circumstances to e-learning courses of action by giving the establishment, stage and educational organizations particularly through cloud suppliers and by using virtualization, united data stockpiling and workplaces for data access watching (Pocatilu et al., 2009). With a particular final objective to ensure accomplishment in e-learning, schools use estimations systems changed in accordance with evaluate the sufficiency of e-learning game plans in light of the cloud.

Starting now, there are various practices and outlines as for the use of cloud computing. For example, in Commonwealth, various schools and universities had collaborated at the

course of action of Virginia Virtual Computing Lab (Wyld, 2009). This allowed associations both to hack down IT costs (by diminishing the necessities of approving and programming overhauling) and to keep up it is own specific server ranches, furthermore to improve IT resources for analyzes and understudies. By including the cloud organizations, North Carolina State University fulfilled a liberally reducing of expenses with programming approving and meanwhile to decrease the grounds IT staff from 15 to 3 agents with full working timetable (Wyld, 2009). Another outline is Kuali Ready (Bristow et al., 2010), a gathering source wander authorized to give a business movement organizing organization and it is in like manner an instance of cutting edge training establishments sorting out themselves to give cloud organizations. Kuali Ready is a tolerable early instance of some key decides that is ascending to guide cloud headways.

Inside the present down to earth setting, the use of Cloud Computing transforms into a need and unimaginable for a few universities. This point is a result of countless, for instance, costs grow the heaviness of pay assemble, understudies' thriving, institutional execution and competition being produced (Sasikala and Prema, 2010). Eventually, a late study seeing using Cloud Computing as a piece of cutting edge training, shows that universities may even now be found in the time of "early adopters" close by various zones, for instance, business and regulatory (Katz et al., 2010). The immense variables that effect the decision of using Cloud Computing as a piece of cutting edge instruction change a little from various divisions. Thusly, according to(Katz et al., 2010), 70% of the IT pioneers from cutting edge instruction (from 302 survey respondents) have considered that upgrading IT organizations is the most basic decision variable, while only 38% gave the same hugeness to costs diminishment.

2.5 Framework of Technology Organization Environment (TOE) strength, Weakness, Opportunities and Threat (SWOT)

TOE serves as scientific classification for variables that encourage or restrain the selection of developments (Haag and Eckhardt, 2014). TOE has advantage over Diffusion of Innovation model because of the thought of the earth elements (Oliveira and Martins, 2010; Alshamaila et al., 2013).

Institutional hypothesis addresses the interrelationship between foundations.

Appropriation hypothesis was utilized as a part of the setting of foundations. It addresses just the specialized components (Ross, 2010). The hypothetical structure of TOE was proposed by Tornatzky and Fleischer in 1990 on considering the appropriation of innovation advancements (Haag and Eckhardt, 2014).

TOE was utilized as a part of the setting of cloud computing (Haag and Eckhardt, 2014). Prior to that, it was utilized as a part of comparative examination ranges, for example, open framework, e-business and Internet use. A few variables were investigated and approved. TOE is an institutional level hypothesis as opposed to Technology Acceptance Model. At institutional level, investigation ought not be centered around specialized variables as it were. The institutional and natural connections of running the innovation ought to be coordinated and dissected (Tam, 1997; Alshamaila et al., 2013).

Advanced education Cloud Computing was tried under TOE system in created nations. A study that was directed in USA uncovered that similarity, top administration backing, and relative favorable position had the most noteworthy commitments to the difference in IT chiefs' enthusiasm for receiving cloud computing. Establishment size was not found a critical determinant of the reception (Taweel, 2012).

Alharbi proposed a redesigned UTAUT that incorporate the trust build in the first model (Alharbi, 2014). The faultfinder for this paper is that UTAUT is proper for individual level. Nonetheless, he recommended this model for foundations. What's more, trust in view of his definition can be secured by the security and protection variable under TOE. With regards to cloud computing, for the most part, diverse variables were connected with each of TOE scientific categorizations in various studies (Klug, 2014; Hsu et al, 2014; Lian et al, 2014; Oliveira et al, 2014). In light of (Shiau et al., 2012) in spite of the fact that contrasting the outcomes from one study with another might be troublesome, the way that studies use distinctive elements does not keep a specialist from assessing the best possible use of the TOE structure. Tashkandi and Al-Jabri (2015) expressed that Academic investigation of Cloud Computing inside Saudi Arabia is a rising examination field. Saudi Arabia speaks to the biggest economy in the Arabian Gulf area. This positions it as a potential business sector of cloud computing advancements. Selection of new developments ought to be gone before by investigation of the additional worth, difficulties and sufficiency from innovative, authoritative and ecological points of view.

(2) Statement of Contribution/Method: This cross-sectional exploratory exact examination depends on Technology, Organization and Environment model focusing on advanced education foundations. In this study, the variables that impact the selection by advanced education organizations were dissected and tried utilizing Partial Least Square. (3) Results, Discussion and Conclusions: Three variables were discovered noteworthy in this setting. Relative Advantage, Data Privacy and Complexity are the most noteworthy elements. The model clarified 43% of the aggregate reception measure variety. Noteworthy contrasts in the regions of cloud computing similarity, multifaceted nature, seller lock-in and peer weight amongst vast and little establishments were uncovered. Things for future cloud computing examination were investigated through open-finished inquiries. Selection of cloud administrations by advanced education organizations has been begun. It was found that the appropriation rate among huge colleges is higher than little advanced education establishments. Enhancing the system and Internet Infrastructure in Saudi Arabia at a moderate expense is a pre-imperative for cloud computing reception. Cloud administration supplier ought to address the protection and many-sided quality concerns raised by non-adopters. Future data frameworks that are potential for facilitating in cloud were organized.

Mohmed et al. (2015) discussed and separating: thoughts of cloud computing, cloud computing models, cloud computing organizations, cloud computing Architecture and the basic objective of this paper is to how to use and associated cloud computing Architecture in cutting edge instruction, in immature countries, the republic of Sudan as a model.

Ibe-Ariwa and Ariwa (2014) expressed that unmistakably the convincing utilization of cloud computing in making economy will change the standard guideline model to PC based virtual applications with a consideration on teaching method. The learning space and capacities required in the HEIs continues going about as hindrances to the extent capacity securing and the headway of reasonable imaginative creative practices.

Asiimwe and Khan (2013) results indicated positive discernments. Respondents revealed that pervasive computing and PC intervened social affiliation are basic in their preparation on account of purposes of enthusiasm, for instance, flexibility, viability to the extent cost and time, ability to secure PC capacities. In light of present circumstances downsides where in like manner determined for case prosperity effects, insurance and

security issues, tumult in the learning environment, to say yet a couple. This paper gives suggestions on the most capable strategy to beat risks indicated.

Adrees et al. (2016) communicated that the usage of cloud computing development in cutting edge training at all made countries addresses an authentic open entryway for those countries. Their study arrangements to perform SWOT examination to choose the impact of the cloud computing use, for instance, Strengths, Weaknesses, Opportunities and Threats (SWOT) in cutting edge training foundations of the base made countries, Republic of Sudan as model, and that from the perspective of Directors, Teachers and Students, to find the effect of characteristics, deficiencies, opportunities and perils when using cloud computing development as a piece of cutting edge instruction. Their study revealed positive results, by virtue of the purposes of premium offered by, for instance, the versatility and viability, and the ability to picking up learning.

Odeh et al. (2015) exhibited that the consolidation of bleeding edge progressions inside guideline has as frequently as could be expected under the circumstances overhauled teaching. In cutting edge instruction it is not an amazement that using the latest headways as a piece of cloud computing improves learning rehearses and subsequently ensures they are more clever, available, and accommodating. The straightforwardness of compromise, joint exertion, and sharing of information and data made possible by cloud computing will be further updated if this specific movement is used honorably and as a part of a nitwit evidence way. In this paper, a SWOT examination of the impact of cloud computing on cutting edge training frameworks is presented. A SWOT examination is here appeared to be a valuable associate in fundamental authority for all propelled instruction establishments while considering the development of their present learning systems to cloud based structures.

As indicated by Angeles (2014) the SWOT examination system urges firms to exploit both their inside qualities and outer open doors that could work to support them to upgrade their capacity to serve clients and therefore, create more incomes and/or enhance their piece of the pie position. On the other hand, firms are urged to oversee and conquer inside shortcomings and outer dangers by arranging ahead and astutely utilizing their accessible assets to minimize the potential negative effect on these organizations. The relationship or closeness amongst TOE and SWOT structure shape the outer level which

is identified with the open door made by cloud computing in the outside environment, in this manner including the ecological setting of the TOE system. While from the inside level the quality of cloud computing of the SWOT system is identified with the relative focal points of the TOE structure.

CHAPTER 3
THOERTICAL FRAMEWORK

3.1 Cloud Computing in Higher Educational Institutions (HEIs)

Higher instructive organizations (HEIs) are confronted with should be inventive with the goal them should stay aggressive. There is additionally a requirement for HEIs to offer their understudies quality instruction with the goal that they can be all around prepared for the occupation market after graduation. Accordingly, there is a requirement for programming and applications that could be utilized as a part of preparing understudies and enhancing correspondence among individuals from HEIs. These product and applications are regularly costly and some HEIs can't bear the cost of them because of the high value (Oh et al., 2014). HEIs are in this way looking for option approaches to obtain these product and applications at moderate cost (Ghilic-Micu, 2011). Cloud computing has the ability to kill this issue by giving HEIs required programming and applications at next to zero expense. Cloud computing will likewise furnish HEIs with the chance to concentrate more on different exercises like research and instructing (Baniwal, 2013) in light of the fact that issues with the product and applications will be dealt with by the administration suppliers. Cloud computing is the procurement of computing assets, for example, programming, equipment, framework and stage to clients over the web on a compensation as you go premise. These assets are given by an administration supplier who assumes the sole liability of owning the framework and adjusting and keeping up them as vital subsequently remembering the clients of the weight of purchasing their own foundation and overhauling and looking after them. Therefore, clients can concentrate on their center business exercises and can perform better. The attributes of cloud computing incorporates on-interest self-administration which permits clients to get to and utilize the required assets with no cooperation with the administration supplier; expansive system access which permits clients to get to the assets from an extensive variety of assets, for example, desktop PCs, tablet, telephones, iPods and so forth.; asset pooling which permits the administration supplier to allot and reallocate assets, for example, stockpiling,

preparing and transmission capacity to countless in view of interest; fast versatility which permits clients to increment or diminish their solicitation for assets in light of their needs; and measured administration which permits the administration suppliers to have the capacity to screen the customers use of assets and have the capacity to charge them taking into account the use (Mell and Grance, 2014).

3.2 Service Models

Cloud computing has three principle administration models which depend on the sort of asset being advertised. These are Software as a Service (SaaS), Infrastructure as a Service (IaaS) and Platform as a Service (PaaS).

3.2.1 Software as a Service (SaaS)

SaaS gives clients access to applications over an extensive variety of gadgets through a system interface or a meager customer, for example, web program over the web (Mell and Grance, 2014). Clients can get to these applications whenever in wherever and can proceed from any place they halted the past time (Akande and Van Belle, 2013). As a result of the likelihood of getting to course content at whatever time and anyplace, learning sharing can be enhanced among clients in HEIs (Chang et al., 2012).

3.2.2 Infrastructure as a Service (IaaS)

IaaS gives clients access to computing assets, for example, stockpiling, preparing and arranges over the web (Akande and Van Belle, 2013). This permits clients to have the capacity to run applications on and save their information on the gave assets without worrying about the administration and upkeep of the assets (Mell and Grance, 2014).

3.2.3 Platform as a Service (PaaS)

PaaS permits clients to convey their own particular applications onto the cloud and gives them control over their applications (Akande and Van Belle, 2013). The administration supplier is left with the obligation of overseeing and controlling the hidden framework, for example, servers, systems, stockpiling and working frameworks (Mell and Grance, 2014). Despite the fact that the three administration models are utilized as a part of higher

instructive foundation, the emphasis on this paper is on Software as a Service since it is the most widely recognized administration model among higher instructive organizations

3.3 Deployment Models

Pretty much as there are administration models, cloud computing likewise has organization models. These are private cloud, group cloud, open cloud and half and half cloud.

3.3.1 Private Cloud

In a private cloud, the cloud foundation is committed for use by a solitary association with various divisions such a college with various educators and offices. The college or an administration supplier claims the foundation. The college can oversee it themselves or let the administration supplier oversee it for them. The base can be either on premises or off premises (Mell and Grance, 2014). This arrangement model gives the college more control of the framework and information since it is claimed and utilized solely by the college.

3.3.2 Community Cloud

In people group cloud, the cloud foundation is devoted for use by two or more associations with comparative objectives and targets (Mell and Grance, 2014; Akande and Van Belle, 2013). For instance, one or more colleges or an administration supplier can possess, oversee and utilize the cloud foundation. The base can be in one or a greater amount of the colleges that makes up the group. It could likewise be at an administration suppliers premises or some a player in the foundation could be in one or a greater amount of the colleges while the rest of the part could be at the administration suppliers' premises (Mell and Grance, 2014).

3.3.3 Public Cloud

In an open cloud, the cloud foundation is committed for use by the overall population. It could be utilized by people, organizations, government associations and any one from the overall population. It is possessed by the administration supplier who controls the base (Mell and Grance, 2014).

3.3.4 Hybrid Cloud

Half breed cloud is a mix of two or more sending models. For instance, a college could utilize private cloud for their delicate information and use open cloud for their less touchy information (Mell and Grance, 2014).

3.4 Benefits of Software as a Service in Higher Education

Programming as a Service offers numerous advantages for advanced education organizations and it has the capacity to enhance the learning procedure in HEIs. A portion of the advantages Software as a Service offer HEIs include:

- Any time, wherever get to

Understudies, instructors, managerial staff and other cloud clients in the establishment can get to the cloud from wherever whenever and proceed with their work without losing any information. This will help them in finishing their undertakings on time (Yadav, 2014). For instance, understudies can now proceed with their assignments at home or wherever they are given they have web access. Subsequently, they will have the capacity to meet their due dates.

- No establishment is required by the organization

The time required for establishment and redesigns of programming and applications could be utilized for other imperative errands as the administration supplier does every one of the establishments and overhauls (Maaita et al., 2013; Ghilic-Micu et al., 2011).

- Cost decrease

HEI can spare the cash required for buying and permitting of programming and applications. The cash required for upkeep could likewise be spared and utilized for other essential assignments (Yadav, 2014).

- Ease of utilization

Cloud administration suppliers try to make their applications and programming simple to utilize in light of rivalry with different suppliers as clients would favor less mind boggling applications to more unpredictable ones. This makes it simple for clients to have the capacity to comprehend and utilize cloud applications and programming with next to zero preparing (Deepa and Sathiyaseelan, 2012).

- Improved cooperation and learning sharing among foundations

Understudies, speakers and other cloud clients in establishments can share information and thoughts effectively in a group cloud. This will help them in staying up with the latest with different foundations (Deepa and Sathiyaseelan, 2012).

- Little time to set up

An ideal opportunity to set up or dispatch the cloud benefits and is up and running is quick in light of the fact that there is no requirement for establishments by the clients. This implies they can begin utilizing the administrations very quickly after membership (Maaita et al., 2013).

- Scalability

The quantity of cloud clients in an establishment can be expanded or diminished whenever relying upon the organizations prerequisites. This helps the foundations to augment the utilization of assets and just utilize and pay for assets that are used (Madisha and Van Belle, 2013).

3.5 Limitations of Software as a Service in Higher Education

- Data lock in and dependence on administration supplier

There is plausibility that the clients won't have the capacity to move to other administration supplier on the off chance that they are not fulfilled by the present administration supplier. This prompts over dependence on the administration supplier and this could influence the nature of cloud administration if the administration supplier is failing to meet expectations (Akande et al., 2013).

- Security problems

Security is one of the greatest difficulties with cloud reception (Mokhtar et al., 2013). It is trusted that security is one of the three fundamental issues in cloud computing selection in HEIs. The other two issues are execution and accessibility. The information put away and shared utilizing the administration suppliers applications might be gotten to by an unapproved individual. Therefore, it is fundamental for clients to guarantee that the administration suppliers have stringent measures to ensure their information and data (Baniwal, 2013).

- Lack of institutionalized value model

Cloud evaluating models have not yet been institutionalized and benefit suppliers have diverse costs and distinctive methods for charging clients (Madisha and Van Belle, 2013). In the event that the clients don't lead careful examinations about the suppliers estimating model, they could wind up selecting a costly administration supplier.

- Dependence on the web

The reliance of cloud on the web is a restriction as any issue with the web would influence administration accessibility (Rostami et al., 2014). Therefore HEIs clients need to guarantee that their web association is quick, solid and open at whatever time they have to get to cloud administrations.

- Customization and Integration problems

At times, it may be troublesome or difficult to coordinate cloud applications inside house applications (Madisha and Van Belle, 2013). HEIs need to examine how simple it would be to incorporate there in house applications with cloud before selecting an administration supplier. Some administration suppliers likewise give applications which are adjustable to the necessities of the clients while customization is troublesome with other administration suppliers' applications. Legitimate comprehension of a client's customization needs is vital so as to choose a cloud application that can be tweaked to address the issues of the clients (Rostami et al., 2014).

- Legal problems

Contingent upon the sending model, lawful issues are a critical thought (Akande et al., 2013) for HEIs while embracing Software as a Service. HEIs ought to see all the legitimate issues required with the diverse areas where their information is put away and the administration suppliers and additionally clients are situated as various nations or districts have distinctive lawful necessities (Rostami et al., 2014). A conceivable approach to guarantee that HEIs realize what moves to make if there should be an occurrence of a rupture by the administration supplier is to guarantee that such activities are independently arranged and settled upon and written in the administration level understanding (SLA) (Kerr and Teng, 2012).

3.6 Software as a Service in Higher Education

The utilization of Software as a Service is expanding over a few businesses and HEIs are a piece of the expanding selection of Software as a Service. Numerous HEIs are as of now understanding the advantages of the Software as a Service and applications. Programming as a Service furnishes HEIs with various application programming, programming environment databases, programming for overseeing email, antivirus, middleware and firewall (Sharma and Ganpati, 2013). Programming as a Service sellers like Microsoft, IBM, Oracle and Saleforce.com offer different instructive programming and applications for instructive establishments (Sharma and Ganpati, 2013). The absolute most well known Software as a Service applications utilized by HEIs incorporate

- Salesforce.com

This Software as a Service application gives clients offices oversee correspondence among HEI partners. It additionally gives offices to oversee understudy and graduated class data. Components to perform ongoing investigation, versatile correspondence, understudy enrollment, group coordinated effort, and application improvement are additionally accessible on this application (Sharma and Ganpati, 2013).

- New Relic

This Software as a Service application is utilized to screen applications running in the cloud. It could be utilized by understudies, scientists, teachers and different individuals from the foundation with the exception of managerial staff (Sharma & Ganpati, 2013).

- Google enormous question

This application permit understudies, teachers and scientist perform examination of vast volumes of information (Sharma & Ganpati, 2013).

- Microsoft Office 365

This Software as a Service application furnishes clients with offices to send and get messages and perform office documentation. It likewise furnishes clients with apparatuses to successfully oversee correspondence and gatherings (Sharma & Ganpati, 2013). It can be utilized by understudies, speakers, educators, managerial staff, analysts and designers and every single other client in the foundation.

- Rack space email

This Software as a Service application gives offices, for example, web mail, notes and

timetable. It additionally gives offices to oversee contacts and set up gatherings. It is accessible for use by understudies, speakers, teachers and every other partner in the foundation aside from designers (Sharma & Ganpati, 2013). There are a few undertakings and exercises which understudies, teachers, scientists and different individuals from an establishment can perform utilizing Software as a Service. A portion of the errands incorporate transferring and downloading of instructional exercises, assignments and tests. Errands, for example, send messages, setting up gatherings and information examination can likewise be performed utilizing Software as a Service (Yadav, 2014). Fig. 1 demonstrates clients of Software as a Service in higher instructive foundations.

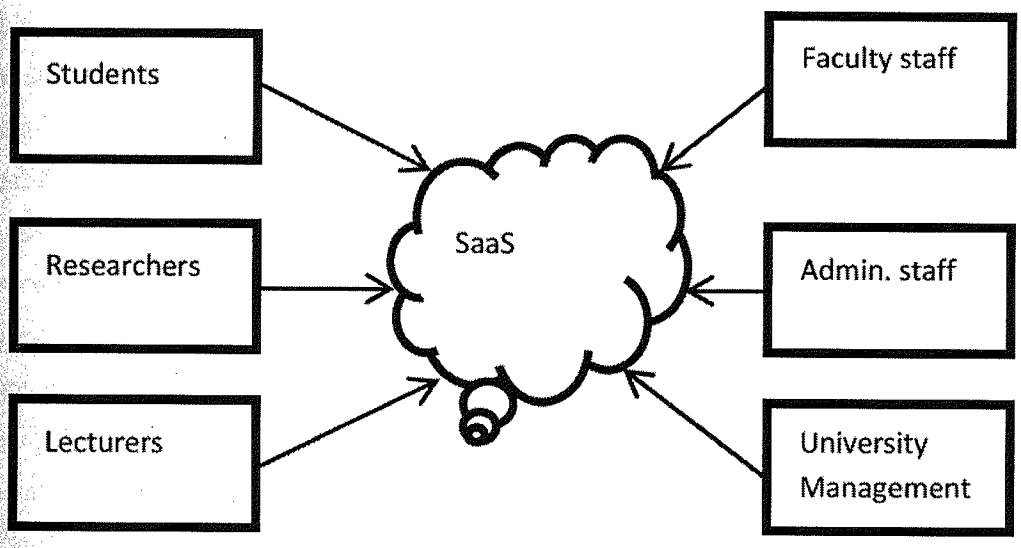

Figure3.1: Typical users of software as a service in HEIs

3.7 Strengths of Cloud Computing

Receiving Cloud computing in advanced education does not by any stretch of the imagination require any expensive IT foundation or programming environment. Cloud computing independent from anyone else offers every one of these administrations either on a "pay–as–you-go" or 'lease by-the-hour" framework, as presented by Amazon's

Elastic Cloud Computing (EC2), which cases to give resizable PC limit in the cloud (Odeh et al., 2015). As indicated by a 2011 overview by the Pew Research Center, 75% of grown-ups say school is excessively costly for most Americans, making it impossible to manage. Besides, 57% said that the advanced education framework in the U.S. neglects to give understudies with great worth to the cash they and their families spend (Odeh et al., 2015). EC2 fundamentally leases to research researchers computing assets and/or programming situations, which generally can be amazingly costly if much venture is made in-house servers. The Electrical Engineering and Computer Science division at the University of California, Berkeley, with its idea of Virtual Computing Labs offered to its understudies, has profited generously from an abundantly diminished expense and additionally maintaining a strategic distance from the twin-harm of over provisioning and under provisioning of inward server farms (Fox et al., 2009). Setting up a learning framework in the cloud gives the adaptability for a learner or an employee to utilize the learning entry whenever it might suit them. Additionally since the entrance is facilitated in the cloud, it is constantly accessible through the web, and consequently any remotely found client can get to materials and use them to learn by means of the web. In a cloud-based learning framework, the capacity base is given as an administration on a compensation for each utilization premise. These capacity frameworks are exceedingly exceptional and have various reflecting of information. Information reinforcement servers are prepared to take reinforcements consequently after particular periods. With every one of these offices, advanced education frameworks that receive cloud computing will have enhanced information reinforcement and recuperation components (Odeh et al., 2015). The execution of versatile stockpiling with Amazon S3 at the Universities of Stanford and Texas is another case of the achievement of utilizing cloud administrations where area freedom and top of the line storerooms are offered by various suppliers. This execution has enhanced capacity limit and the freedom of access of the computing environment, yet in the meantime has brought down the cost (Odeh et al., 2015). Versatility is additionally quality of cloud-based learning frameworks (Verissimo et al., 2012; Jhawar and Piuri, 2013). By flexible frameworks we mean here that in any cloud administration there is dependably a type of failover that disseminates repetitive usage of IT assets crosswise over physical areas. Versatility is made conceivable by keeping more

than one comparable asset. Along these lines more prominent excess of assets can make the administration stronger. Versatility in cloud computing is a trademark in cloud innovation that can deal with the expanding of workload by expanding assets sum through giving new virtual assets powerfully. It is robotized capacity of cloud supported frameworks to straightforwardly scale the different IT assets, as required amid runtime conditions (Sobeslavsky et al., 2010). Though, Scalability is to expand and build the assets sum ahead of time by expect the greatest framework future needs (Sobeslavsky et al., 2010). Cloud-based learning frameworks offer high versatility and Elasticity highlight. Thus, Cloud computing innovation gives superior and enormous assets. Another quality of Cloud computing that the sending of cloud administrations is simple since these administrations doesn't typically require any abnormal state establishments or arrangements at the customer's site. Every one of the administrations can be associated specifically to the cloud administration. The assorted qualities of gadgets that can be utilized by Cloud computing is another primary quality. Most convenient media and hand-held gadgets including advanced mobile phones, Tablets, portable workstations PDAs and digital book perusers can get to the cloud-based gateway for taking in purposes from any area since the entrance is facilitated in the cloud (Furht & Escalante, 2010).

3.8 Weaknesses of Cloud Computing

There are a few shortcomings that ought not to be overlooked while particularly receiving cloud computing in advanced education.

One of the real shortcomings of cloud-based learning frameworks is the high reliance of the occupant on the administration supplier (Grandinetti, 2013). Since the whole application, the capacity and the earth itself is facilitated in the cloud, there is for all intents and purposes nothing the clients are in control of. Everything is subject to the cloud administration supplier's system.

Different shortcomings are because of the specialized troubles that show up through crossing over any barrier between the generally run and oversaw application when relocating to an exceedingly propelled cloud computing administration. The application, databases and the network could however be adjusted to the Processor so as to keep away

from a few if not these troubles (Odeh et al., 2015).

Inconvenience shooting an application which is facilitated in an administration supplier's server is likewise exceptionally troublesome. Cloud-based administrations, such as learning frameworks can't be completely controlled at the inhabitant level. This is on account of, aside from a not very many authoritative controls over the application and the database facilitated in the cloud, the administration supplier may not be keen on giving some other controls over his administration. Subsequently the measure of adaptability and control clients get while facilitated in their server is missing (Grandinetti, 2013).

Other than this, there can be dangers of inaccessibility of different assets in a cloud-based framework. This is on the grounds that numerous applications would doubtlessly be facilitated in a cloud-based framework and there is the chance that every one of the assets are being spent or connected with at a specific time. Besides, a portion of the servers may get to be over-stacked. Realness of the information got from a cloud administration is another theme of concern (Zissis & Lekkas, 2012; Zia et al., 2014). Information could be defiled because of security breaks in the cloud system. Additionally, since there are various occupants that have facilitated their applications and their information in a cloud, so it is conceivable that the information that is recovered in actuality be from totally distinctive information base. Appropriate and powerful security check ought to be utilized with a specific end goal to stay away from this sort of glitches.

3.9 Opportunities of Cloud Computing

One of the real open doors that can be investigated and took advantage of a cloud-based advanced education framework is the level of association and synergistic learning. Intelligent learning frameworks may give a balanced instructor understudy environment to the clients. Synergistic learning is empowered by giving the clients access to the incomprehensible measure of learning material and media over the entry, which makes the learning background wealthier. Prophet APEX is a community oriented learning environment used to process Web-based SQL asks for, and offers a stage for snappy, and profoundly solid, improvement and web applications (Odeh et al., 2015).

The cloud additionally gives keen situations which allot different assets flexibly at run

time. In cloud-based advanced education frameworks, learning gathering is done in a repetitive and disseminated way. This empowers the framework to change over to various assets as and when a specific server asset gets to be occupied. This usefulness of strength of a cloud-based framework gives the venture a chance to be a wise framework with in-fabricated information building abilities (Abbadi & Martin, 2011).

The most essential element that ought to be utilized as an open door for the selection of cloud computing is its simplicity of coordination. The different learning assets, for example, sight and sound based study material and other intuitive media, in different structures and configurations, are incorporated and made accessible to the clients. This is on account of the cloud benefits more often than not bolster all organizations and structures and have a productive stockpiling structure to use on them (Abbadi & Martin, 2011).

Sharing of learning is additionally made conceivable by intuitive sessions and cloud-based gatherings. The center point is that a task dispenses with the enormous measure of printed study material that would somehow or another be supplied to understudies on an advanced education course, along these lines diminishing the carbon impression (Abbadi & Martin, 2011).

Google Sites is a pioneer in showing applications, and in no time much showing practice and research upheld by cloud computing (Odeh et al., 2015). By keeping all the material digitized and guaranteeing its high accessibility over the system, it gives clients a very adaptable advanced learning knowledge.

Cloud-based administrations have an extremely proficient capacity framework with numerous servers of high stockpiling limit with reflecting and standard reinforcement abilities. Capacity as an administration guarantees that the same information is put away in repetitive assets, despite the fact that one asset might be distracted; information can be recovered from another asset. This may guarantees an abnormal state of accessibility in e-learning assets (Madan et al., 2012).

3.10 Threats of Cloud Computing

The security of information in a cloud-based administration is specific concern. This is a direct result of the absence of control by the administration supplier and in view of the absence of data about the kind of security the administration supplier utilizes.

Different dangers, for example, Man-in-the-center and DoS (Denial of Service) can apply to both information in-travel furthermore information that is put away (Jamil and Zaki, 2011). Circulated Denial of Service (DDoS) assaults, in which numerous hubs frameworks all assault one single hub in the meantime with a surge of messages, may bring about the entire framework to go down.

Lock-in or seller lock-in, is a method which guarantees that the client or occupant that needs to utilize a cloud administration should likewise utilize a specific outsider merchant administration. A portion of the cloud administration suppliers even force a limitation on the sort of programming; application; and equipment to be utilized with a specific end goal to make utilization of their administrations. Additionally, these sorts of administrations likewise convey substantial exchanging costs between contending merchants. For instance, Google utilizes Big Table for capacity where Facebook utilizes Cassandra and Amazon utilizes Dynamo (Okai et al., 2014). Since there is no basic interface between these databases, movement between them is either impractical or is very immoderate.

Spontaneous promoting or spamming is another significant danger that is clear in numerous cloud-based frameworks. ANDROIDOS_SNDAPPS.SM is one such adware found in application store. This adware infiltrates a buyer gadget and presentations spontaneous notices. Amid an execution procedure, it assembles particular data from a client's gadget. It then sends this data to a site (Odeh et al., 2015). This specific garbage mail can stick the interchanges lines which bringing about higher down times and genuinely weaken the accessibility of assets.

Indeed, even an information stockpiling administration can be abused by this sort of risk. These ought to be evaded by guaranteeing that the administration supplier has legitimate hostile to spamming systems set up. In any case, most cloud administration suppliers do not have a feeling of deceivability in dealing with the cloud. They additionally think that it's extremely hard to oversee multi-tenure. Since numerous organizations as occupants

are running virtual occasions of their applications totally freely of each other, the administration of these and in addition the whole base is extremely unpredictable.

The entrance control and validation strategy for a particular cloud administration ought to be done in an extremely proficient manner. Since there is dependably an absence of control for the occupant, the sort of controls and the degree of control that is to be given to an inhabitant ought to be affirmed in the product level assention (SLA) to keep away from further issues (Odeh et al., 2015).

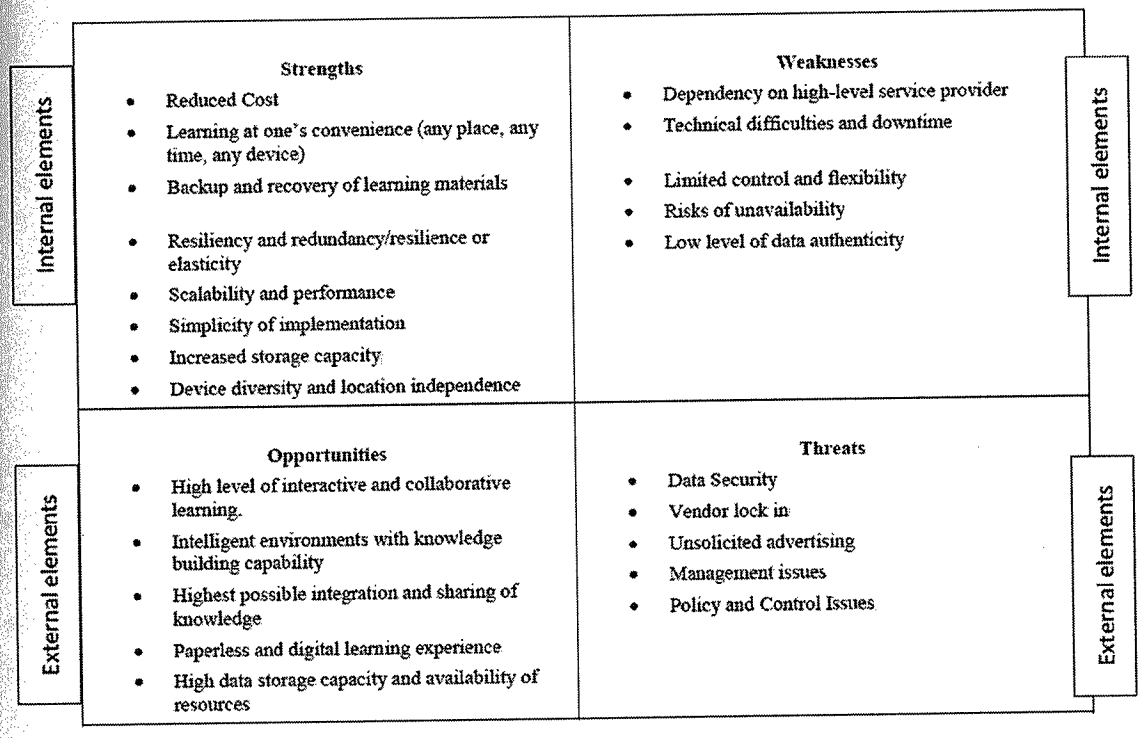

Figure 3.2: Cloud computing SWOT analysis (Odeh et al., 2015)

3.11 Technology-Organization-Environment (TOE) Framework

Tornatzky and Fleischer (1990) proposed the TOE structure to clarify the procedure of advancement with regards to a venture. It considers three components of an undertaking that impacts the adoption of advancement - technology, association and environment connection. The technology setting alludes to the inward and outer technology pertinent to the association, and the important innovations that are accessible for conceivable adoption. The association connection alludes to the clear qualities of the firm (i.e.,

hierarchical structure, firm size, administrative structure, level of centralization), assets (HR and slack assets), and procedure of correspondence (formal and casual) among representatives. The earth setting contains the business sector components, contenders, and the administrative environment (Tornatzky et al., 1990). Figure 3.2 shows TOE system.

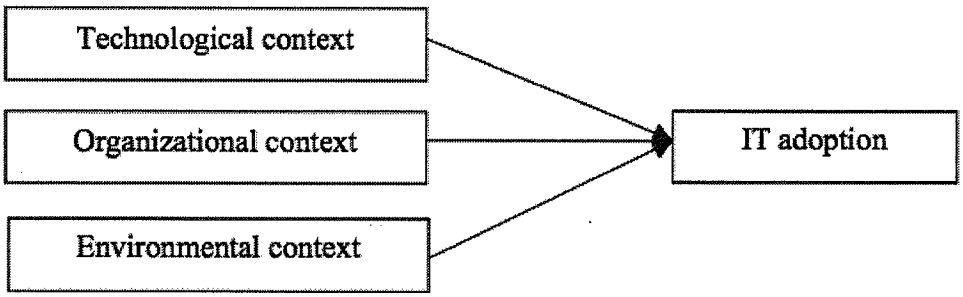

Figure 3.3: TOE Frameworks (Tornatzky et al., 1990)

As it is delineated in Figure 3.2, innovative part of the TOE system alludes to both accessibility and qualities of the advancements. Any inside and outside technology that is important to the firm is a piece of the innovative perspective. As indicated by TOE, advancements that are as of now being used by the firm and innovations, which are in the business sector however not being used by the firm, impact the adoption choice. Advancements that are as of now being used by the firm impact the adoption choice, since they characterize the degree and farthest point of the innovative change that the firm can acknowledge. Then again the innovations that are in the business sector however not being used by the firm impact the adoption choice, since they show how firms can develop by receiving new advances. As indicated by Tornatzky et al. (1990), Technologies that are outside the association's limits make incremental, manufactured or broken changes. Advancements that offer incremental changes just add new components to the current advances. This kind of advances has the most reduced measures of dangers. Advancements, which create engineered changes, are those, which join officially existing innovations novelty. These developments are reasonably dangerous. Irregular changes are those, which are fundamentally not quite the same as the current advances (Baker, 2012).

Authoritative connection of TOE system portrays the attributes and assets of the association, for example, its size, structure and correspondence forms. Authoritative qualities influence the adoption and usage choices from various perspectives. Hierarchical Structure is an element that impacts the adoption procedure. Analysts trust that decentralized associations are most appropriate for development stage; while unified associations are most appropriate for usage phase of advancement procedure. Correspondence process inside the association is another authoritative component that impacts the adoption procedure. Top administration conduct is likewise another powerful element, which can advance or repress the adoption of a development (Baker, 2012).

Natural part of this system alludes to structure of the business, innovative bolster base, and government's directions. A few specialists trust that in the quickly developing commercial ventures the adoption is higher, while in experienced or declining businesses, advancement practices are not clear. Another natural element that impacts the adoption procedure is the accessibility of gifted work. The effect of government on development procedure is not clear. Government control can either bolster or restrain the adoption of development (Baker, 2012).

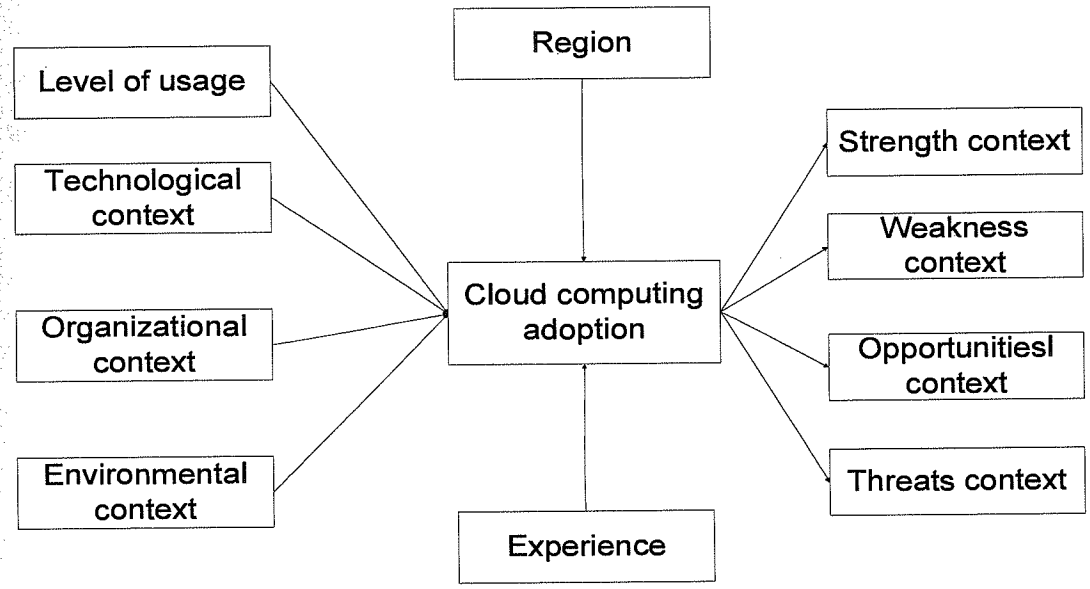

Figure 3.4: SWOT, TOE, Region, level of use and experience on cloud computing adoption

CHAPTER 4
METHODOLOGY

4.1 Research Models

This study tends to investigate instructors' perceptions on adoption of cloud computing by universities in Northern Cyprus and Northern Iraq. This research's main aim is to understand the perceptions of instructors towards cloud computing adoption in universities with respect to the level of usage, teaching experience, and region. Independent variables are: region (Northern Cyprus and Northern Iraq), level of usage in cloud computing (section II, item 7) and years of teaching experience (section I, item 6). The first research design was cross sectional causal comparative model (Figure 4.1a).
Where research model 2 The dimensions of SWOT and TOE and their corresponding items are Strength of cloud computing (SCC), Weaknesses of cloud computing (WCC), Opportunities of cloud computing (OCC), Threats of cloud computing (TCC), Relative advantage (RA), Compatibility (CO), Complexity (CX), Management support (MS), vendor lock-in (VL), data concern (DC) and government regulation (GR). Total average scores for each sub-dimension and for SWOT and TOE separately were calculated and used as dependent variables in the analysis part (Figure 4.1b).

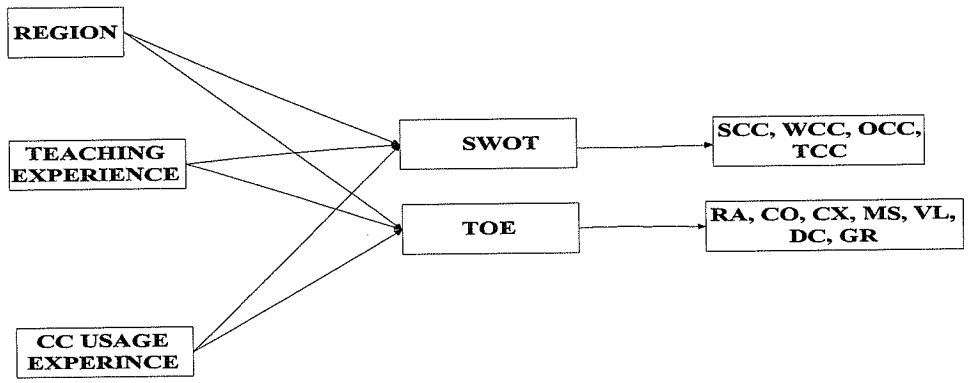

Figure4.1a: Research model of the study based on differences

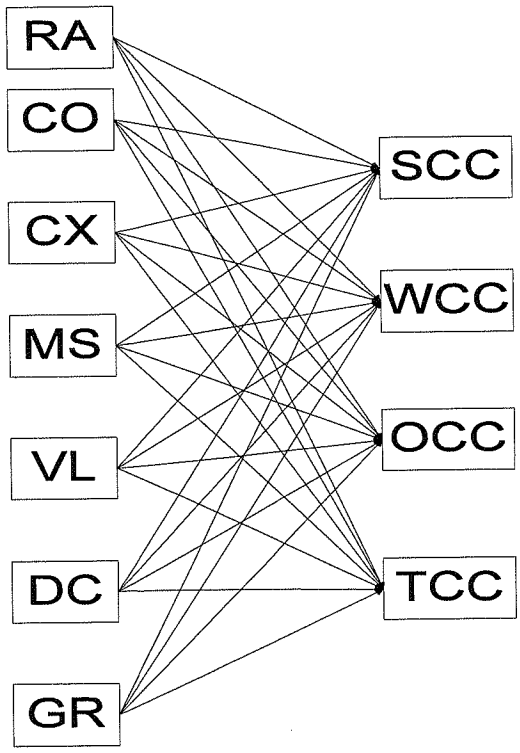

Figure 4.1b: Research model of the study based on relation on dimensions

4.2 Procedure

This study tends to investigate instructors' perceptions on adoption of cloud computing by universities in Northern Cyprus and Northern Iraq. This research's main aim is to understand the perceptions of instructors towards cloud computing adoption in universities with respect to the level of usage, teaching experience, and region. And for this thesis to be successfully the survey questionnaires were given to over 500 instructors in Cyprus International University (CIU), Near East University (NEU), Eastern Mediterranean University (EMU), Girne American University (GAU), Lefke European University (LEU), Sulaimani University, Soran University, Sulaimani Polytechnic University, Human Development University and Salahaddin University in both Northern Cyprus and Northern Iraq for over 60 days and collected back from volunteered instructors within 5 day time. In Northern Cyprus; 2 public and 3 private universities were chosen for collecting data for convenience in Northern Cyprus, about 125

questionnaires were retrieved from all of the universities collectively in Northern Cyprus from the department of Management/Computer information system, Architecture, Business Administration, International Relations, Software Engineering, and Computer Engineering, from convenience. In Northern Iraq; 4 public and 1 private universities were chosen for collecting data from well recognized universities in Northern Iraq about 175 questionnaires were retrieved from all of the universities collectively in Northern Iraq from the department of Architecture, Business Administration, International Relations, Mathematics, Information technology, computer education, English, Software Engineering, and Computer Engineering. The following Universities were selected because they are one of the most popular, common and highly advanced universities in both region.

The work was done in a time of more than 9 months with a populace test of 300 educators. After the gathering of surveys from the teachers, a sum of just 300 accurately filled polls were recouped from the educators from different colleges inside and out, the amassed information were subjected to different examination, (such as; frequency and percentage, Pearson correlation, independent *t*-test, and one-way ANOVA) in order to give answer to the aim of the study/research questions of the study. A short time later the outcomes from the information investigation were examined in subtle elements and conclusion and suggestion were drawn from the consequences of the study (see Figure 4.2).

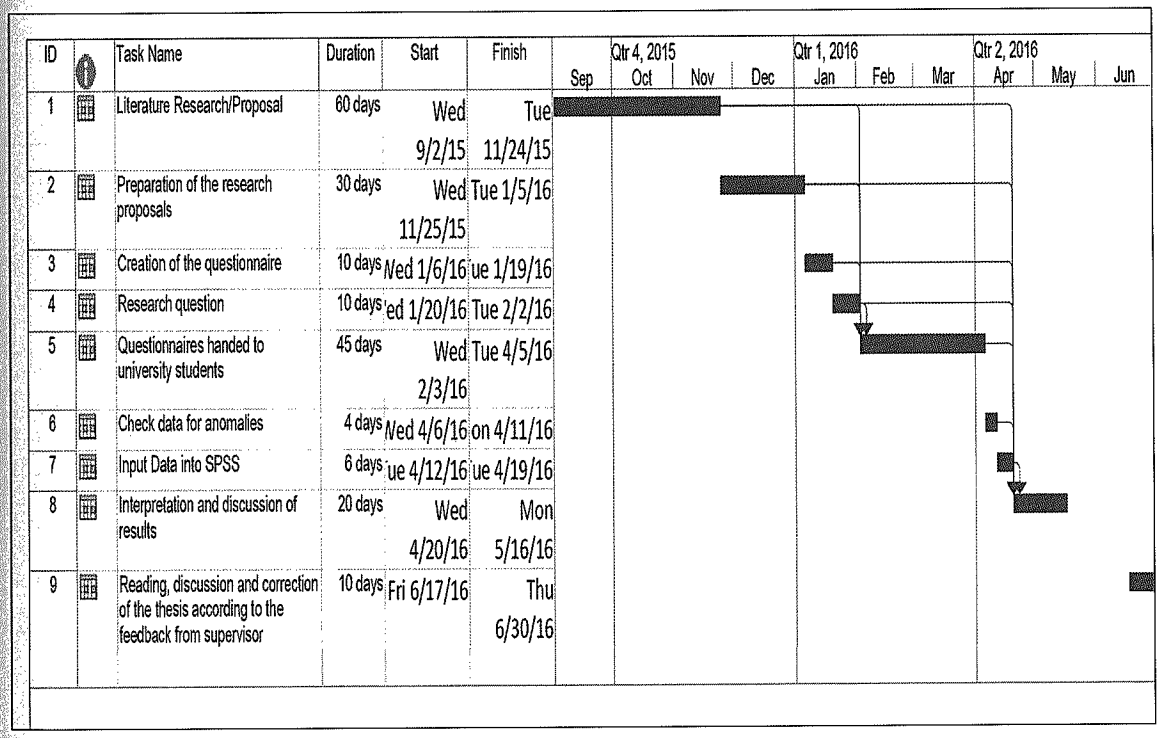

Figure 4.2: Gantt chart showing thesis schedule

Table 4.1: List of faculties visited in all the universities in the case study

EMU

Faculties	Full Time	Part Time	Chosen Number
Architecture	39	31	4
Art and Science	55	29	3
Business and Economics	52	38	10
Education	56	34	3
Engineering	63	17	5
Total	**265**	**149**	**25**

Table 4.1: Continued...

NEU

Faculties	Full Time	Part Time	Chosen Number
Architecture	48	24	4
Art and Science	66	-	4
Economic And Administrative	56	41	13
Open & Distance Education	28	-	2
Engineering	58	40	2
Total	**256**	**105**	**25**

EUL

Faculties	Full Time	Part Time	Chosen Number
Architecture	20	-	4
Art and Science	13	-	4
Economic And Administrative	23	-	10
Education	36	-	2
Engineering	31	-	5
Total	**123**	-	**25**

CIU

Faculties	Full Time	Part Time	Chosen Number
Architecture	25	-	4
Art and Science	16	-	3
Economic And Administrative	24	-	13
Education	42	-	1
Engineering	53	-	4
Total	**160**	-	**25**

Table 4.1: Continued...

GAU

Faculties	Full Time	Part Time	Chosen Number
Architecture	48	-	4
Business And Administrative	22	-	10
Education	17	-	2
Engineering	23		9
Total	**110**	-	**25**

Sulaimani Polytechnic University

Faculties	Full Time	Part Time	Chosen Number
Art and Science	75	-	10
Business And Economics	47	-	10
Education	42	-	5
Engineering	34	-	5
Total	**198**		**30**

Soran University

Faculties	Full Time	Part Time	Chosen Number
Arts	136	-	5
Science	67	-	15
Education	72	-	8
Engineering	11	-	7
Total	**285**	-	**35**

Table 4.1: Continued...

Salahaddin University

Faculties	Full Time	Part Time	Chosen Number
Arts	200	-	5
Science	176	-	5
Education	223	-	3
Engineering	179	-	24
Economics &Administrative	110	-	3
Total	**888**	**-**	**40**

University of Human Development

Faculties	Full Time	Part Time	Chosen Number
Administration & Economics	34	-	14
Science & Technology	30	-	10
Education	43	-	1
Total	**107**	**-**	**25**

Table 4.1: Continued...

University of Sulaimani

Faculties	Full Time	Part Time	Chosen Number
Engineering	120	-	2
Science And Education Science	180	-	3
Education	123	-	3
Administration & Economics	89	-	36
Total	**512**	-	**44**

4.3 Participated Instructors

Totally 500 instructors accepted the questionnaire and only 300 instructors filled the asked questions properly. Participants of the survey are 55.7% male and 44.30% female. 24.30% of participants are from age group 25-27, 30.70% from age group 28-30 and 45.00% belongs to age group 30+. 41.70% of participants were from North Cyprus universities while 58.30% participants were from North Iraq Universities. 40.00% of the instructors that participated were Master/PhD title holder, 45.30% of the instructors that participated were Assist/Assoc. Professor and 14.70% of the instructors that participated were Professor (Table 2).

Table 4.1: Participants demographic information (N=300)

Characteristics	Frequency	%
Gender		
Male	167	55.70
Female	133	44.3
Age		
25-27	73	24.30
28-30	92	30.70
30+	135	45.00
Country		
North Cyprus	125	41.70
North Iraq	175	58.30
Academic Title		
MSc/PhD	120	40.00
Assist/Assoc. Prof	136	45.30
Prof.	44	14.70

The universities that participated are Cyprus International (CIU), Near East (NEU), Eastern Mediterranean (EMU), Girne American (GAU), Lefke European (LEU), Sulaimani, Soran, Sulaimani Polytechnic, Human Development and Salahaddin (Figure 4.2a). The faculty that participated is Engineering, Economics and Administrative Sciences, Science and technology, Education, Architecture and Art faculty (Figure 4.2b). And the departments that participated are computer education, computer science, computer engineering, software engineering, international relation, business administration, architecture, information technology, management/computer information science, English and mathematics department (Figure 4.2c).

From Figure 4.2a below NEU, CIU, EMU, GAU, LEU and Human Development Universities all have 8.3% individually, while; Sulaimani University has 15.00%, Soran University has 11.70%, Sulaimani Polytechnic University has 10.00%, and Salahaddin University has 13.30%.

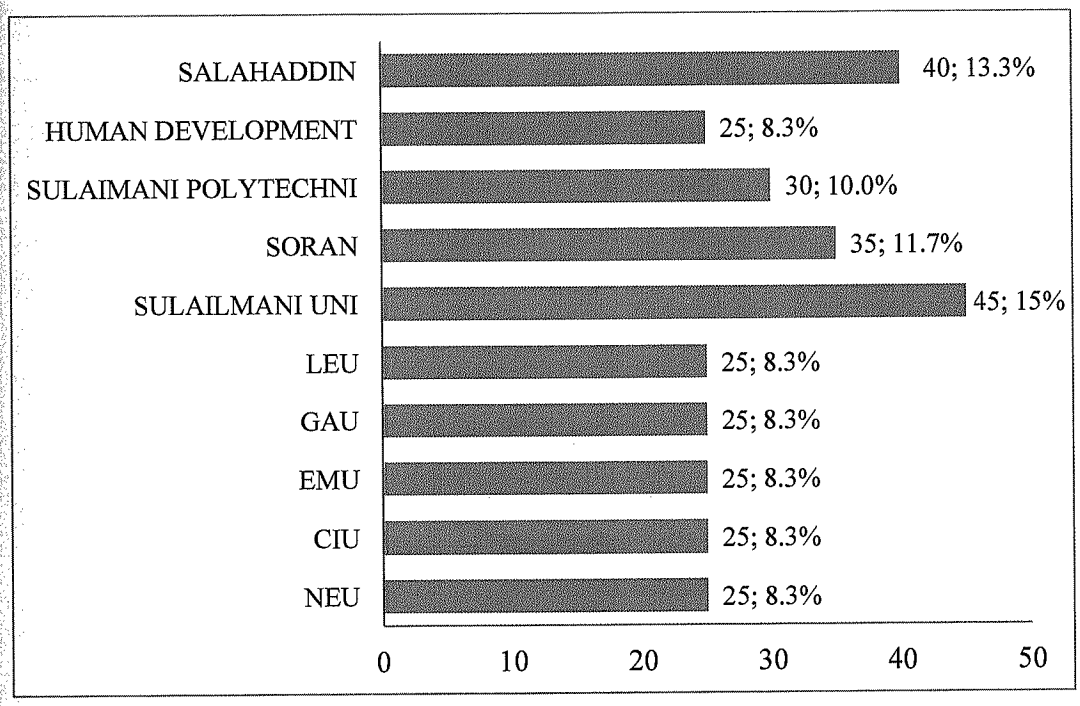

Figure 4.2a: Various universities that participated

Engineering Faculty has 13.70%, Economics and Administrative Sciences Faculty has 47.30%, Science and technology Faculty has 19.70%, Education Faculty has 10.00%, Architecture Faculty has 6.70% and Art Faculty has 2.70% (Figure 4.2b).

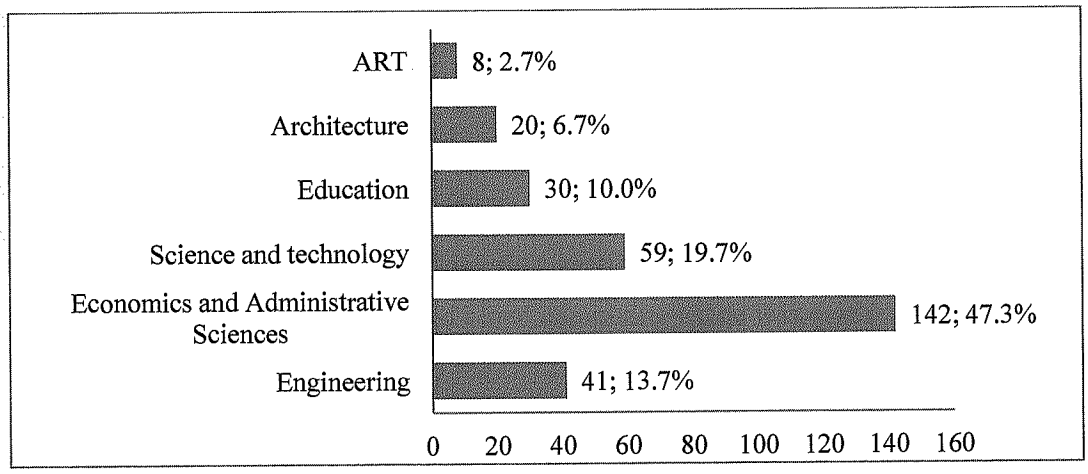

Figure 4.2b: Various instructors that participated

Computer education department has 10.00%, computer science department has 10.00%, computer engineering department has 8.30%, software engineering department has 5.30%, international relation department has 20.00%, business administration department has 24.00%, architecture department has 6.00%, information technology department has 6.30%, management/computer information science department has 3.30%, English department has 2.70%and mathematics department has 3.30% (Figure 4.2c).

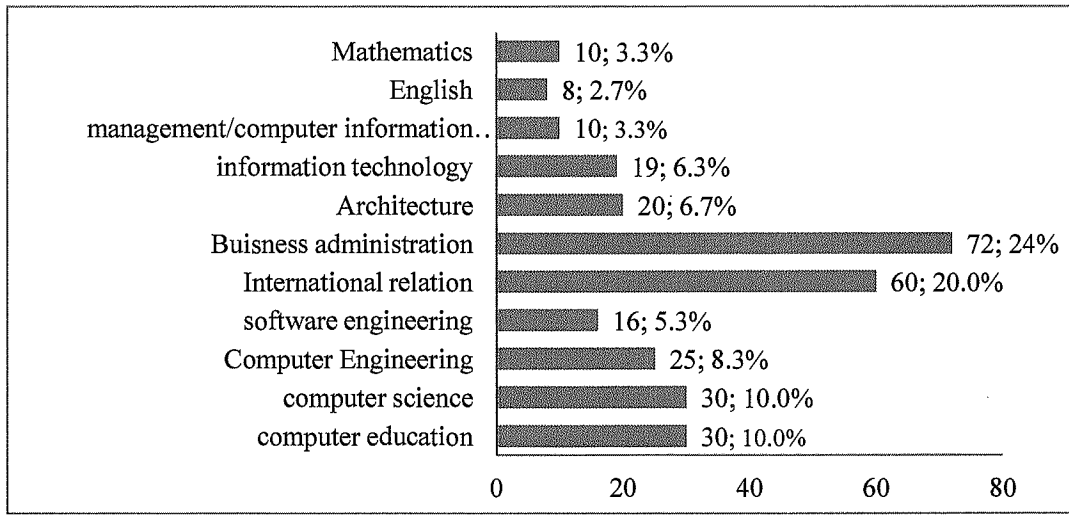

Figure 4.2c: Various departments that participated

4.4 Data Collection

This study was quantitative in nature using a questionnaire, which was drafted from the study of (Odeh et al., 2015) and (Tashkent & Al-Jabri, 2015). The questionnaire is basically divided into three sections; first section having demographic information, second sections which was contained cloud computing usage was drafted from the study of (Tashkent & Al-Jabri, 2015), and the third section is made of two frameworks which are SWOT which was drafted from the study of (Odeh et al., 2015) and its consist of the strength, weakness, opportunities and threat of cloud computing and TOE which was drafted from the study of (Al-Jabri, 2015)) and 2 questions (Northern Cyprus and Iraq universities and colleges are currently adopting cloud computing; and Northern Cyprus and Iraq universities and colleges will be adopting cloud computing in the near future)

here from Environment dimension were removed since it was thought by the researcher that they were irrelevant to this study, and it look at the relative advantages, compatibility, complexity, management support, vendor lock-in, data concerns and government regulation issues on cloud computing adoption, with each bearing different dimensions and items and has total 45 items under both frameworks. Under the SWOT framework, SCC has 8 items, WCC has 5 items, OCC has 5 items and TCC has 5 items, which is 23 in total. While for TOE framework, RA has 4 items, CO has 3 items, CX has 3 items, MS has 3 items, VL has 4 items, DC has 3 items and GR has 3 items, which is 22 in total. The instructors answered to items on 5 Likert Scale from "Strongly Agree" (5 point), "Agree" (4 point), "Neutral" (3 point), "Disagree" (2 point), and "Strongly Disagree" (1 point) which has calculated Cronbach's alpha reliability (internal consistency) of .747 Cronbach's alpha value in the range of .705 to .885 (Table 4.2a and Table 4.2b) which is considered good (Cohen, 1998), which is an evidence that the survey is highly reliable instrument to administer. George and Mallery (2003) gave the following rules of thumb: "≥ .9 – Excellent, ≥ .8 – Good, ≥ .7 – Acceptable, ≥ .6 – Questionable, ≥ .5 – Poor, and ≥ .5 – Unacceptable" (p. 231).

Table 4.2a: Reliability test for SWOT subscales of the questionnaire

Dimensions	Cronbach's Alpha Reliability
SCC	.744
WCC	.732
OCC	.860
TCC	.785
Total	**.724**

Table 4.2b: Reliability test for TOE subscales of the questionnaire

Dimensions	Cronbach's Alpha Reliability
RA	.705
CO	.825
MS	.822
VL	.769
DC	.885
GR	.788
Total	**.658**

4.4 Working and Teaching Experience

It was observed from the result as shown Figure 4.3 below, that only 40% has worked and taught less than 5 years, 45% has worked and taught 5-10 years and only 15% has worked and taught more than 10 years from a population pull of 300 instructors whom participated in the survey.

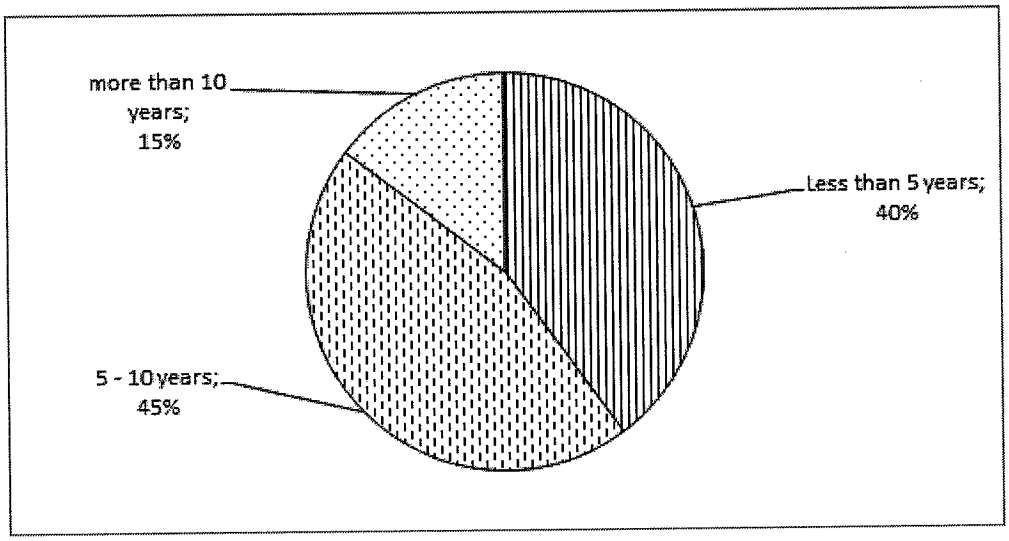

Figure 4.3: Working and teaching experience

4.5 Cloud Computing Usage

4.5.1 The Status of your Institution in Adopting Cloud Computing

It was observed from the result as shown Figure 4.4 below, that only 10.0% institution have already adopted cloud computing, 19.0% organization have assessed and wanting to embrace cloud computing, 21.7% establishment at present assessing cloud computing, 17.7% foundation have assessed, yet not wanting to receive cloud computing and 31.7% have not considered cloud computing adoption from a population pull of 300 instructors whom participated in the survey.

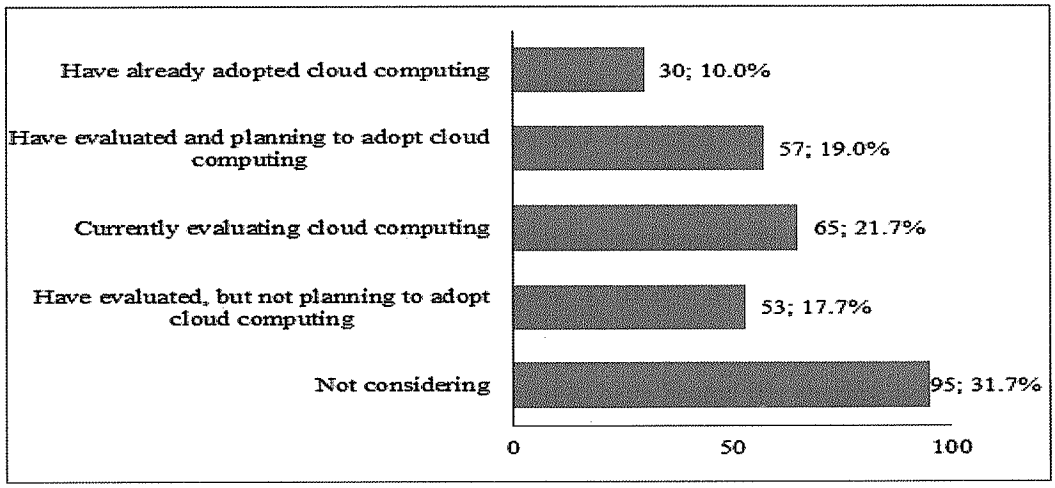

Figure 4.4: The status of your institution in adopting cloud computing

4.5.2 The Status of IT Resources/Service

Figure 4.5 explains status of IT resources/services by institutions. According to the findings, 271 instructors responded that their institution have hosted e-mail service, 29 instructors responded that their institution plan to have hosted e-mail service and none of them responded that their institution have no plan to hosted e-mail service. 53 instructors responded that their institution have hosted e-learning service, 179 instructors responded that their institution plan to have hosted e-learning service and 68 of them responded that their institution have no plan to hosted e-learning service. 146 instructors responded that their institution have hosted learning management systems, 139 instructors responded

that their institution plan to have hosted learning management systems and 16 of them responded that their institution have no plan to hosted learning management systems. 202 instructors responded that their institution have hosted library systems, 88 instructors responded that their institution plan to have hosted library systems and 10 of them responded that their institution have no plan to hosted library systems.

Also from Figure 4.5, all the instructors (300) responded that their institution have hosted university/college website or portal. 73 instructors responded that their institution have hosted file backup and storage systems, 214 instructors responded that their institution plan to have hosted file backup and storage systems and 13 of them responded that their institution have no plan to hosted file backup and storage systems. 82 instructors responded that their institution have hosted online collaboration systems, 183 instructors responded that their institution plan to have hosted online collaboration systems and 35 of them responded that their institution have no plan to hosted online collaboration systems. 143 instructors responded that their institution have hosted student record systems, 144 instructors responded that their institution plan to have hosted student record systems and 13 of them responded that their institution have no plan to hosted student record systems. 125 instructors responded that their institution have hosted file sharing systems, 93 instructors responded that their institution plan to have hosted file sharing systems and 82 of them responded that their institution have no plan to hosted file sharing systems. And finally Figure 4.5, 84 instructors responded that their institution have hosted office productivity suite, 136 instructors responded that their institution plan to have hosted office productivity suite and 80 of them responded that their institution have no plan to hosted office productivity suite. 27 instructors responded that their institution have hosted ERP system, 90 instructors responded that their institution plan to have hosted ERP system and 183 of them responded that their institution have no plan to hosted ERP system. 90 instructors responded that their institution have hosted project management system, 91 instructors responded that their institution plan to have hosted project management system and 119 of them responded that their institution have no plan to hosted project management system. 28 instructors responded that their institution have hosted virtual lab environment, 185 instructors responded that their institution plan to have hosted virtual lab environment and 87 of them responded that their institution have

no plan to hosted virtual lab environment.

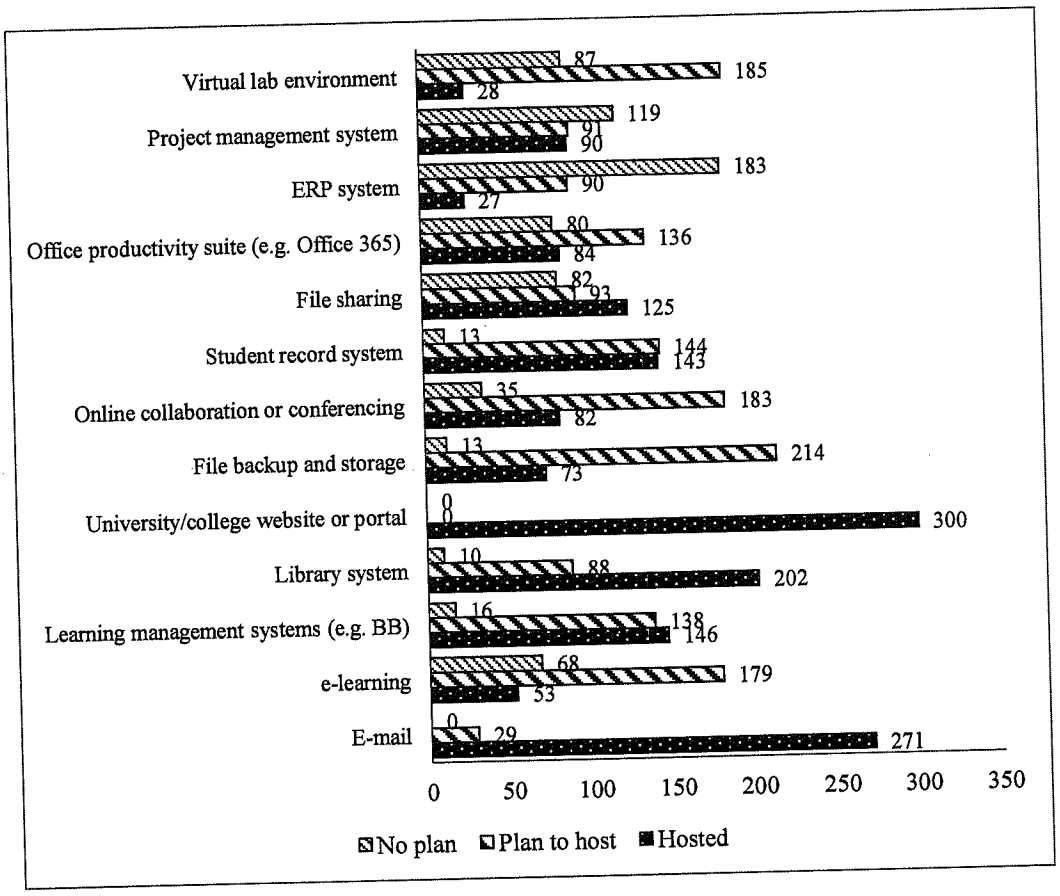

Figure 4.5: The status of IT resources/service

4.6 Data Analysis

Questionnaire was utilized to gather information and was broke down and deciphered utilizing Statistical Package for Social Sciences (SPSS) for examination. Unmistakable insights was utilized for exploration question 1, Independent example t-test was utilized for examination question 2, for examination question 3 one-way ANOVA was utilized and to investigate question 4.1, and 4.2 two separate one-way ANOVA were utilized and for question 5 Pearson correlation was utilized for the examination.

CHAPTER 5
RESULTS AND DISCUSSIONS

5.1 Instructors'Perceptions about the Current Status on Cloud Computing Adoption by Universities of Northern Cyprus and Northern Iraq

In order to understand the Instructors' perceptions about the current status on cloud computing adoption by universities of Northern Cyprus and Northern Iraq descriptive analysis was employed. Table 5.1a and Table 5.1b below show the statements, mean and standard deviation for each construct. The means and standard deviations listed below show the answers the students picked from the 5-point Likert scale in the questionnaire.

From the items on SWOT framework "intelligent environments with knowledge building capability" had the highest mean value of (M = 4.66; SD = 0.677), followed by "highest possible integration and sharing of knowledge" (M = 4.61; SD = 0.775), and "has low level of data verification" (M = 4.58; SD = 0.729). And the lowest from the whole items are "increased storage capacity" (M = 3.84; SD = 1.08), followed by "offers limited control and flexibility" (M = 3.91; SD = 1.13) and "good performance" (M = 3.92; SD = 0.834) (Table 5.1a).

In TOE framework "Cloud computing can reduce IT expenses" had the highest mean value of (M = 4.75; SD = 0.567), followed by "Using cloud computing allows us to perform specific tasks more quickly" (M = 4.72; SD = 0.644), and "Cloud computing can shorten Information Systems deployment time" (M = 4.70; SD = 0.641). And the lowest from the whole items are "The skills necessary to using cloud computing are too complex for me" (M = 4.44; SD = 0.922), followed by "The skills necessary to using cloud computing are too complex for me" (M = 4.44; SD = 0.962) and "Cloud computing authorizes the use of specific IT resources" (M = 4.46; SD = 0.926) (Table 5.1b). The constructs of the proposed research model in chronological order according to the mean totals in Table 5.1a are as follows: OCC (M = 4.57; SD = 0.793) which gave the highest total response and SCC gave the lowest mean (M = 4.16; SD = 0.879) under SWOT framework. All dimensions under SWOT responses fell with the of "Agree". While in TOE framework the mean totals in Table 5.1b are as follows: RA (M = 4.74; SD = 0.594) which gave the highest total response and GR gave the lowest mean (M = 4.49; SD = 0.872). All dimensions under TOE responses fell within "Agree". This result is in line with those of (Tashkandi & Al-

Jabri, 2015) whose study show that RA had the highest mean values, while CX and GR gave the lowest values. For SCC, instructors gave response under the agree section in the Likert scale, which is a positive opinion. For WCC, instructors gave response under the agree section in the Likert scale, which is a positive opinion. For OCC, instructors gave response under the agree section in the Likert scale, which is a positive opinion. For TCC, instructors gave response under the agree section in the Likert scale, which is a positive opinion. For RA, instructors gave response closer to strongly agree section in the Likert scale, which is a positive opinion. For CX, instructors gave response under the agree section in the Likert scale, which is a positive opinion. For MS, instructors gave response under the agree section in the Likert scale, which is a positive opinion. For VL, instructors gave response under the agree section in the Likert scale, which is a positive opinion. For DC, instructors gave response under the agree section in the Likert scale, which is a positive opinion. For GR, instructors gave response under the agree section in the Likert scale, which is a positive opinion. And finally the overall average for all dimensions, instructors gave response under the agree section in the Likert scale, which is a positive opinion.

Table 5.1a: SWOT framework descriptive

Items	Mean	SD
STRENGTHS OF CLOUD COMPUTING (SCC)		
Cloud computing offers:		
1. Reduced cost	4.13	.697
2. Learning at one's convenience (any place, any time, any device)	4.23	.920
3. Backup and recovery of learning materials	4.13	1.048
4. Elasticity	4.19	.874
5. Good performance	3.92	.834
6. Simplicity of implementation	4.35	.882
7. Increased storage capacity	3.84	1.08
8. The use of various devices and it can be used in any location	4.47	.676

Table 5.1a: Continued ...

Average Total	**4.16**	**.879**
WEAKNESSES OF CLOUD COMPUTING (WCC)		
Cloud computing:		
9. Depends on high-level service provider	4.56	.877
10. Has technical difficulties and downtime	4.23	1.05
11. Offers limited control and flexibility	3.91	1.13
12. Offers risks of unavailability	4.21	1.15
13. Has low level of data verification	4.58	.729
Average Total	**4.30**	**.986**
OPPORTUNITIES OF CLOUD COMPUTING (OCC)		
Cloud computing offers:		
14. High level of interactive and collaborative learning	4.50	.844
15. Intelligent environments with knowledge building capability	4.66	.677
16. Highest possible integration and sharing of knowledge	4.61	.775
17. Paperless and digital learning experience	4.55	.843
18. High data storage capacity and availability of resources	4.53	.827
Average Total	**4.57**	**.793**
THREATS OF CLOUD COMPUTING (TCC)		
Cloud computing has:		
19. Data security issues	4.56	.809
20. Customer lock in (makes a customer dependent on a supplier for products and services, unable to use another supplier without substantial switching costs) issues	4.42	.948
21. Cloud computing gives unwanted advertising	4.45	.915
22. Cloud computing has management issues	4.44	.947
23. Cloud computing has Policy and Control Issues	4.44	.967
Average Total	**4.46**	**.917**
Total mean for the whole SWOT framework	**4.37**	**.894**

Table 5.1b: TOE framework descriptive

Items	Mean	SD
RELATIVE ADVANTAGE (RA)		
24. Cloud computing can shorten Information Systems deployment time	4.70	.641
25. Using cloud computing allows us to perform specific tasks more quickly	4.72	.644
26. Cloud computing can reduce IT expenses	4.75	.567
27. The use of cloud computing offers new educational and research opportunities	4.79	.523
Average Total	**4.74**	**.594**
COMPATIBILITY (CO)		
28. Cloud Computing is compatible with our academic institution's operations	4.65	.700
29. Cloud Computing is compatible with our IT infrastructure	4.58	.816
30. Using Cloud Computing is compatible with our academic institution's culture and values	4.55	.814
Average Total	**4.59**	**.777**
COMPLEXITY (CX)		
31. The skills needed to implement cloud computing are too complex for our institution	4.55	.823
32. The skills necessary to using cloud computing are too complex for me	4.44	.922
33. The use of cloud computing is frustrating	4.51	.756
Average Total	**4.50**	**.834**
MANAGEMENT SUPPORT (MS)		
34. Top management provides resources for adopting cloud computing	4.52	.807
35. Top management supports the implementation of cloud computing	4.63	.713
36. Top university management understands the benefits of adopting cloud computing	4.48	.871
Average Total	**4.54**	**.800**
VENDOR LOCK-IN (VL- makes a customer dependent on a supplier for products and services, unable to use another supplier without substantial switching costs)		
37. Cloud computing authorizes the use of specific IT resources	4.46	.926
38. Cloud computing make us dependent on the provider services	4.48	.890
39. Cloud computing restricts the ability to switch to another provider	4.58	.739

Table 5.1b: Continued ...

40. The switching cost to another cloud computing provider is high	4.55	.772
Average Total	**4.52**	**.832**
DATA CONCERN (DC)		
I am concerned:		
41. About the leakage of confidential data	4.65	.699
42. That unauthorized person may access our student and research data	4.58	.816
43. About storing our data in the cloud	4.55	.814
Average Total	**4.59**	**.777**
GOVERNMENT REGULATION (GR)		
44. Government laws and regulations are sufficient to protect the use of cloud computing	4.54	.823
45. The skills necessary to using cloud computing are too complex for me	4.44	.962
Average Total	**4.49**	**.872**
Total mean for the whole TOE framework	**4.57**	**.784**

5.2 The Perceptions of Instructors on Cloud Computing Adoption with Respect to Region

In order to understand the perceptions of instructors on cloud computing adoption with respect to region, independent samples *t*-test was employed and Levene's test for equality of variances was used as an assumption to check data before conducting parametric test and if these assumptions are satisfied then parametric test can be done, and it showed that variances are no different across region except for RA and TCC dimension ($p = .003$; $p = 0.14$) (Table 5.2a). According to the Table 5.2b, an independent-samples t-test was conducted to compare the perceptions of instructors on cloud computing adoption with respect to region on both framework dimensions. There was a significant differences between in both regions only existed in SCC conditions $t(298)= -3.045$, $p=0.003$, for WCC conditions $t(298)= 3.214$, $p=0.001$, TCC conditions $t(298)= 2.034$, $p=0.036$, and RA

conditions t(298)= 1.935, p=0.043. While there are no statistical significant differences among others dimensions. In all dimensions RA had the highest score under Northern Cyprus of (M=4.80, SD=0.36) and the least was SCC under Northern Cyprus with score (M=4.05, SD=0.52). Instructors from North part of Iraq have more positive opinions on strengths of cloud computing, may be they don't use cloud computing as much as North Cyprus instructors. Have positive opinions since they haven't faced with difficult. This result is similar with that of (Kim et al., 2012) who reported that significant difference occurs amongst UK, USA and South Korea in terms of cloud computing adoption and implementation. Also (Hailu, 2012) reported from their study with developing countries that there is that significant difference between these countries in terms of cloud computing adoption. (Tashkandi & Al-Jabri 2015) results on Saudi Arabia showed that the Network and Internet infrastructure in Saudi Arabia is under development, the bandwidth is limited and cost is high compared with USA and Europe.

According to Table 5.2c and 5.2d Levene's test for equality of variances showed that variances are there is different across region for SWOT (p = .832) and TOE framework (p = .941). According to the Table 5.2e and 5.2f, an independent-samples t-test was conducted to compare the perceptions of instructors on cloud computing adoption with respect to region on SWOT and TOE total. There were no significant differences between both regions.

Table 5.2a: Test of homogeneity of variances for dimensions

	Levene Statistic	**df1**	**df2**	**Sig.**
SCC	2.326	1	298	.128
WCC	.603	1	298	.438
OCC	.834	1	298	.362
TCC	6.172	1	298	.014
RA	8.723	1	298	.003
CO	.351	1	298	.554
CX	1.750	1	298	.187
MS	.969	1	298	.326
VL	2.080	1	298	.150
DC	1.042	1	298	.308
GR	1.596	1	298	.207

Table 5.2b: The perceptions of instructors on cloud computing adoption with respect to region

Dimensions	Region	N	Mean	SD	F	df	Mean Difference	t	p
SCC	Northern Cyprus	125	4.05	.52	2.326	298	-.186	-3.045	**.003***
	Northern Iraq	175	4.23	.53					
WCC	Northern Cyprus	125	4.45	.73	.603	298	.257	3.214	**.001***
	Northern Iraq	175	4.19	.65					
OCC	Northern Cyprus	125	4.59	.62	6.172	298	.039	.527	.599
	Northern Iraq	175	4.55	.65					
TCC	Northern Cyprus	125	4.56	.59	6.723	298	.160	2.034	**.036***
	Northern Iraq	175	4.40	.72					
RA	Northern Cyprus	125	4.80	.36	8.723	298	.098	1.935	**0.043***
	Northern Iraq	175	4.70	.48					
CO	Northern Cyprus	125	4.58	.74	.351	298	-.014	-.171	.864
	Northern Iraq	175	4.60	.68					
CX	Northern Cyprus	125	4.55	.76	1.750	298	.098	1.052	.294
	Northern Iraq	175	4.45	.82					
MS	Northern Cyprus	125	4.60	.62	.969	298	.077	1.012	.312
	Northern Iraq	175	4.52	.67					

Table 5.2b: Continued …

VL	Northern Cyprus	125	4.53	.57	2.080	298	.067	.944	.346
	Northern Iraq	175	4.48	.63					
DC	Northern Cyprus	125	4.57	.74	1.042	298	-.039	-.472	.637
	Northern Iraq	175	4.61	.67					
GR	Northern Cyprus	125	4.53	.76	1.596	298	.744	.069	.458
	Northern Iraq	175	4.46	.82					

Where; Total sampled population (N); Standard Deviation (SD) and * means $p<0.05$ (there exist statistical significant difference

Table 5.2c: Test of homogeneity of variances for SWOT total

Levene Statistic	df1	df2	Sig.
.045	1	298	.832

Table 5.2d: Test of homogeneity of variances for TOE total

Levene Statistic	df1	df2	Sig.
.005	1	298	.941

Table 5.2e: The perceptions of instructors on cloud computing adoption with respect to region on SWOT total

	Country	N	Mean	Std. Deviation	T	Mean difference	p
SWOTTOTAL	Northern Cyprus	125	4.41	.352	1.606	.067	.109
	Northern Iraq	175	4.34	.363			

Table 5.2f: The perceptions of instructors on cloud computing adoption with respect to region on TOE total

	Country	N	Mean	Std. Deviation	T	Mean difference	p
TOETOTAL	Northern Cyprus	125	4.60	.280	1.553	.0509	.121
	Northern Iraq	175	4.55	.280			

5.3 Perceptions of the Instructors with Respect to Level of Use of Cloud Computing Services at their Institution

In order to understand instructors' perceptions on cloud computing adoption, based on level of use at their institution difference, one-way ANOVA was employed. The assumption of Levene's test of homogeneity of variances showed that the variances are not equal for all dimensions under SWOT framework SCC (p=0.003), WCC (p=0.017), OCC (p=0.001) and TCC (p=0.006) (Table 5.3a) and TOE framework Levene's test of homogeneity of variances showed that the variances are equal for only dimensions CX (p=0.119), VL (p=0.546) and GR (p=0.054) (Table 5.3b).

Table 5.3a: Test of homogeneity of variances for SWOT framework

	Levene Statistic	df1	df2	Sig.
SCC	4.172	4	295	.003
WCC	3.057	4	295	.017
OCC	4.986	4	295	.001
TCC	3.672	4	295	.006

Table 5.3b: Test of homogeneity of variances for TOE framework

	Levene Statistic	df1	df2	Sig.
RA	5.303	4	295	.000
CO	4.409	4	295	.002
CX	1.852	4	295	.119
MS	3.947	4	295	.004
VL	.769	4	295	.546
DC	3.318	4	295	.011
GR	2.355	4	295	.054

From Table 5.3c, there was a significant effect of perceptions of the instructors with respect to level of use of cloud computing services at their institution in WCC at $p<.05$ level [$F(2, 299) = 2.832$, $p = .025$] but there are no significant effect of perceptions of the instructors with respect to level of use of cloud computing services at their institution on other dimensions at $p<.05$ level, SCC [$F(2, 299) = .973$, $p = .422$] OCC [$F(2, 299) = 2.122$, $p = .078$] and TCC [$F(2, 299) = 1.256$, $p = .287$] under the SWOT framework. In TOE framework there is no significant effect for all dimensions at $p<.05$ level, RA [$F(2, 299) = 1.605$, $p = .173$], CO [$F(2, 299) = 1.744$, $p = .140$], CX [$F(2, 299) = .910$, $p = .458$], MS [$F(2, 299) = 1.011$, $p = .402$], VL [$F(2, 299) = .058$, $p = .994$], DC [$F(2, 299) = 1.212$, $p = .306$] and GR [$F(2, 299) = 1.078$, $p = .367$] (Table 5.3d).

From Table 5.3c and 5.3d total mean score for instructors under SWOT framework; OCC ($M = 4.57$; $SD=0.637$) was significantly higher than SCC ($M = 4.16$; $SD=0.53$), WCC ($M = 4.30$; $SD=0.69$) and also from TCC ($M = 4.46$; $SD = 0.67$). In TOE framework; RA ($M = 4.74$; $SD = 0.43$) was significantly higher than CO ($M = 4.53$; $SD = 0.63$), CX ($M = 4.50$; $SD = 0.79$), MS ($M = 4.55$; $SD = 0.65$), VL ($M = 4.71$; $SD = 0.61$), DL ($M = 4.73$; $SD = 0.63$) and also from GR ($M = 4.49$; $SD = 0.79$).

Table 5.3c: Perceptions of the instructors with respect to level of use of cloud computing services at their institution on SWOT framework

Dimensions		N	Mean	SD	Mean Square	F	p
SCC	Not considering	95	4.18	.524	.274	.973	.422
	Have evaluated, but not planning to adopt cloud computing	53	4.14	.605			
	Currently evaluating cloud computing	65	4.05	.644			
	Have evaluated and planning to adopt cloud computing	57	4.21	.425			
	Have already adopted cloud computing	30	4.23	.232			
	Total	300	4.16	.530			
WCC	Not considering	95	4.21	.763	1.330	2.832	.025
	Have evaluated, but not planning to adopt cloud computing	53	4.41	.677			
	Currently evaluating cloud computing	65	4.40	.544			
	Have evaluated and planning to adopt cloud computing	57	4.11	.764			
	Have already adopted cloud computing	30	4.51	.537			
	Total	300	4.30	.694			
OCC	Not considering	95	4.64	.606	.847	2.122	.078
	Have evaluated, but not planning to adopt cloud computing	53	4.49	.706			
	Currently evaluating cloud computing	65	4.62	.530			
	Have evaluated and planning to adopt cloud computing	57	4.40	.758			
	Have already adopted cloud computing	30	4.72	.500			
	Total	300	4.57	.637			
TCC	Not considering	95	4.55	.653	.569	1.256	.287
	Have evaluated, but not planning to adopt cloud computing	53	4.40	.726			
	Currently evaluating cloud computing	65	4.36	.776			
	Have evaluated and planning to adopt cloud computing	57	4.43	.640			
	Have already adopted cloud computing	30	4.60	.403			
	Total	300	4.46	.674			

Table 5.3d: Perceptions of the instructors with respect to level of use of cloud computing services at their institution on TOE framework

Dimensions		N	Mean	SD	Mean Square	F	p
RA	Not considering	95	4.81	.274	.300	1.605	.173
	Have evaluated, but not planning to adopt cloud computing	53	4.67	.495			
	Currently evaluating cloud computing	65	4.76	.419			
	Have evaluated and planning to adopt cloud computing	57	4.65	.570			
	Have already adopted cloud computing	30	4.78	.320			
	Total	**300**	**4.74**	**.434**			
CO	Not considering	95	4.53	1.33	.851	1.744	.140
	Have evaluated, but not planning to adopt cloud computing	53	4.77	.441			
	Currently evaluating cloud computing	65	4.58	.722			
	Have evaluated and planning to adopt cloud computing	57	4.47	.816			
	Have already adopted cloud computing	30	4.73	.628			
	Total	**300**	**4.59**	**.702**			
CX	Not considering	95	4.42	.847	.574	.910	.458
	Have evaluated, but not planning to adopt cloud computing	53	4.65	.655			
	Currently evaluating cloud computing	65	4.55	.799			
	Have evaluated and planning to adopt cloud computing	57	4.42	.855			
	Have already adopted cloud computing	30	4.48	.688			
	Total	**300**	**4.50**	**.794**			
MS	Not considering	95	4.60	.569	.431	1.011	.402
	Have evaluated, but not planning to adopt cloud computing	53	4.46	.683			
	Currently evaluating cloud computing	65	4.63	.521			

Table 5.3d: Continued …

	Have evaluated and planning to adopt cloud computing	57	4.45	.821			
	Have already adopted cloud computing	30	4.58	.553			
	Total	**300**	**4.55**	**.653**			
VL	Not considering	95	4.50	.636	.022	.058	.994
	Have evaluated, but not planning to adopt cloud computing	53	4.54	.644			
	Currently evaluating cloud computing	65	4.51	.564			
	Have evaluated and planning to adopt cloud computing	57	4.49	.650			
	Have already adopted cloud computing	30	4.52	.480			
	Total	**300**	**4.50**	**.608**			
DC	Not considering	95	4.65	.619	.595	1.212	.306
	Have evaluated, but not planning to adopt cloud computing	53	4.48	.844			
	Currently evaluating cloud computing	65	4.63	.607			
	Have evaluated and planning to adopt cloud computing	57	4.48	.812			
	Have already adopted cloud computing	30	4.73	.628			
	Total	**300**	**4.59**	**.702**			
GR	Not considering	95	4.52	.794	.678	1.078	.367
	Have evaluated, but not planning to adopt cloud computing	53	4.42	.892			
	Currently evaluating cloud computing	65	4.65	.623			
	Have evaluated and planning to adopt cloud computing	57	4.40	.893			
	Have already adopted cloud computing	30	4.38	.724			
	Total	**300**	**4.49**	**.793**			

5.4 Perceptions of the Instructors with Respect to Level of Use of Cloud Computing Services at their Institution on Total Average Scale of Dimension

In order to understand instructors' perceptions on cloud computing adoption, based on level of use at their institution difference on total average scale of dimension, one-way ANOVA was employed. The assumption of Levene's test of homogeneity of variances showed that the variances are not equal for SWOT framework (p = 0.004) (Table 5.4a) and TOE framework Levene's test of homogeneity of variances showed that the variances are not equal (p=0.026) (Table 5.4b).

Table 5.4a: Test of homogeneity of variances on SWOT Total

Levene Statistic	df1	df2	Sig.
3.953	4	295	.004

Table 5.4b: Test of homogeneity of variances on TOE Total

Levene Statistic	df1	df2	Sig.
2.810	4	295	.026

From Table 5.4c, there was no significant effect of perceptions of the instructors with respect to level of use of cloud computing services at their institution on SWOT total average score at $p<.05$ level [$F(2, 299) = 2.170$, $p = .072$] and also there was no significant effect of perceptions of the instructors with respect to level of use of cloud computing services at their institution on TOE framework at $p<.05$ level [$F(2, 299) = 1.944$; $p = .103$] (Table 5.4d). From Table 5.4c and 5.4d total mean score for instructors under SWOT framework; "Have already adopted cloud computing" (M = 4.52; SD=0.212) was significantly higher than "Not considering" (M = 4.39; SD=0.36), "Have evaluated, but not planning to adopt cloud computing" (M = 4.36; SD=0.37), "Currently evaluating cloud computing" (M = 4.36; SD=0.34) and also from "Have evaluated and planning to adopt cloud computing" (M = 4.29; SD = 0.41). In TOE framework; "Currently evaluating cloud computing" (M = 4.61; SD = 0.23) was significantly higher than "Have already adopted cloud computing" (M = 4.48; SD=0.32), "Not considering" (M = 4.58; SD=0.29), "Have

evaluated, but not planning to adopt cloud computing" (M = 4.48; SD=0.32) and also from "Have already adopted cloud computing" (M = 4.60; SD = 0.24).

Table 5.4c: Perceptions of the instructors with respect to level of use of cloud computing services at their institution on total average scale of SWOT framework

Items	N	Mean	SD	Mean Square	F	p
Not considering	95	4.39	.360			
Have evaluated, but not planning to adopt cloud computing	53	4.36	.372			
Currently evaluating cloud computing	65	4.36	.340	.276	2.170	.072
Have evaluated and planning to adopt cloud computing	57	4.29	.410			
Have already adopted cloud computing	30	4.52	.212			
Total	**300**	**4.37**	**.359**			

Table 5.4d: Perceptions of the instructors with respect to level of use of cloud computing services at their institution on total average scale of TOE framework

Items	N	Mean	Std. Deviation	Mean Square	F	P
Not considering	95	4.58	.285			
Have evaluated, but not planning to adopt cloud computing	53	4.567	.293			
Currently evaluating cloud computing	65	4.61	.228	.151	1.944	.103
Have evaluated and planning to adopt cloud computing	57	4.48	.323			
Have already adopted cloud computing	30	4.60	.242			
Total	**300**	**4.57**	**.281**			

5.5 Perceptions of the Instructors with Respect to Years of Teaching Experience

In order to understand instructors' perceptions on cloud computing adoption, based on years of teaching experience difference, one-way ANOVA was employed. The assumption of Levene's test of homogeneity of variances showed that the variances are not equal for dimensions under SWOT framework, expect for OCC (p=0.333) and TCC (p = 0.245) (Table 5.5a) and TOE framework Levene's test of homogeneity of variances showed that the variances are equal for only dimensions MS (p=0.119), VL (p=0.546) and GR (p= 0.054) except for other dimensions (Table 5.5b).

Table 5.5a: Test of homogeneity of variances for SWOT framework with respect to years of teaching experience

	Levene Statistic	df1	df2	Sig.
SCC	5.523	2	297	.004
WCC	3.536	2	297	.030
OCC	1.105	2	297	.333
TCC	1.412	2	297	.245

Table 5.5b: Test of Homogeneity of Variances for TOE framework with respect to years of teaching experience

	Levene Statistic	df1	df2	Sig.
RA	4.491	2	297	.012
CO	5.520	2	297	.004
CX	4.321	2	297	.014
MS	2.623	2	297	.074
VL	.114	2	297	.893
DC	5.194	2	297	.006
GR	2.609	2	297	.075

From Table 5.5c, there was a significant effect of perceptions of the instructors with respect to years of teaching experience in SCC and WCC at p<.05 level [F(2, 299) = 3.909, 17.359; p = .021, .000] but there are no significant effect of perceptions of the instructors with respect to years of teaching experience on other dimensions at p<.05 level, OCC [F(2, 299) = .378, p = .685] and TCC [F(2, 299) = ..478; p = .620] under the SWOT framework. In TOE framework there is no significant effect for all dimensions at p<.05 level, RA [F(2, 299) = 1.004, p = .368], CO [F(2, 299) = .919, p = .400], CX [F(2, 299) = 2.056, p = .130],

MS [F(2, 299) = .709, p = .493], VL [F(2, 299) = .156, p = .856], DC [F(2, 299) = .875, p = .418] and GR [F(2, 299) = 1.727, p = .180] (Table 5.5d).

From Table 5.2c and 5.2d total mean score for instructors under SWOT framework; OCC (M = 4.57; SD=0.64) was significantly higher than SCC (M = 4.21; SD=0.39), WCC (M = 4.06; SD=0.75) and also from TCC (M = 4.45; SD = 0.64). In TOE framework; RA (M = 4.74; SD = 0.43) was significantly higher than CO (M = 4.59; SD = 0.70), CX (M = 4.50; SD = 0.79), MS (M = 4.55; SD = 0.65), VL (M = 4.50; SD = 0.61), DL (M = 4.59; SD = 0.70) and also from GR (M = 4.49; SD = 0.79).

Table 5.5c: Perceptions of the instructors with respect to level of use of cloud computing service at their institution on SWOT framework

		N	Mean	SD	Mean square	F	p
SCC	Less than 5 years	120	4.21	.392	1.078	3.909	**.021**
	5 - 10 years	136	4.07	.651			
	more than 10 years	44	4.28	.390			
	Total	**300**	**4.16**	**.530**			
WCC	Less than 5 years	120	4.06	.751	7.529	17.359	**.000**
	5 - 10 years	136	4.54	.536			
	more than 10 years	44	4.19	.732			
	Total	**300**	**4.30**	**.694**			
OCC	Less than 5 years	120	4.53	.683	.154	.378	.685
	5 - 10 years	136	4.59	.617			
	more than 10 years	44	4.61	.571			
	Total	**300**	**4.57**	**.637**			
TCC	Less than 5 years	120	4.45	.643	.218	.478	.620
	5 - 10 years	136	4.50	.675			
	more than 10 years	44	4.39	.759			
	Total	**300**	**4.46**	**.674**			

Table 5.5d: Perceptions of the instructors with respect to level of use of cloud computing services at their institution on TOE framework

		N	Mean	SD	Mean square	F	p
RA	Less than 5 years	120	4.77	.363	.189	1.004	.369
	5 - 10 years	136	4.70	.488			
	more than 10 years	44	4.78	.437			
	Total	**300**	**4.74**	**.434**			
CO	Less than 5 years	120	4.53	.832	.453	.919	.400
	5 - 10 years	136	4.65	.573			
	more than 10 years	44	4.58	.679			
	Total	**300**	**4.59**	**.702**			
CX	Less than 5 years	120	4.44	.779	1.285	2.056	.130
	5 - 10 years	136	4.59	.728			
	more than 10 years	44	4.35	.986			
	Total	**300**	**4.50**	**.794**			
MS	Less than 5 years	120	4.50	.724	.303	.709	.493
	5 - 10 years	136	4.59	.612			
	more than 10 years	44	4.59	.565			
	Total	**300**	**4.55**	**.653**			
VL	Less than 5 years	120	4.49	.632	.058	.156	.856
	5 - 10 years	136	4.53	.579			
	more than 10 years	44	4.50	.638			
	Total	**300**	**4.51**	**.608**			
DC	Less than 5 years	120	4.53	.831	.431	.875	.418
	5 - 10 years	136	4.64	.606			
	more than 10 years	44	4.64	.586			
	Total	**300**	**4.59**	**.702**			
GR	Less than 5 years	120	4.42	.789	1.082	1.727	.180
	5 - 10 years	136	4.59	.732			
	more than 10 years	44	4.40	.962			
	Total	**300**	**4.49**	**.793**			

5.6 Perceptions of the Instructors with Respect to Level of Use of Cloud Computing Services at their Institution on Total Average Scale of Dimension of both SWOT and TOE Framework

In order to understand instructors' perceptions on cloud computing adoption, based on level of use at their institution difference on total average scale of dimension, one-way ANOVA was employed. The assumption of Levene's test of homogeneity of variances showed that the variances are not equal for SWOT framework ($p = 0.004$) (Table 5.6a) and TOE framework Levene's test of homogeneity of variances showed that the variances are not equal ($p=0.026$) (Table 5.6b).

Table 5.6a: Test of homogeneity of variances on SWOT total

Levene Statistic	df1	df2	Sig.
.174	2	297	.840

Table 5.6b: Test of homogeneity of variances on TOE total

Levene Statistic	df1	df2	Sig.
1.718	2	297	.181

From Table 5.6c, there is significant effect of perceptions of the instructors with respect to years of teaching experience on SWOT total average score at $p<.05$ level [$F(2, 299) = 3.042$, $p = .049$] and also there is significant effect of perceptions of the instructors with respect to years of teaching experience on TOE framework at $p<.05$ level [$F(2, 299) = 3.223$; $p = .041$] (Table 5.6d).

From Table 5.6c and 5.6d Post hoc comparisons using Fisher's LSD test that is appropriate for three mean scores indicated that then total mean score for instructors under SWOT framework; *"5 – 10 years"* (M = 4.42; SD=0.35) was significantly higher than *"less than 5 years"* (M = 4.31; SD=0.36) and also from *"more than 10 years"* (M = 4.37; SD = 0.37). In TOE framework; *"5 – 10 years"* (M = 4.61; SD=0.27) was significantly higher than *"less than 5 years"* (M = 4.52; SD=0.28) and also from *"more than 10 years"* (M = 4.55; SD = 0.30).

Table 5.6c: Perceptions of the instructors with respect to level of use of cloud computing services at their institution on total average scale of SWOT framework

	N	Mean	Std. Deviation	Mean Square	F	p
Less than 5 years	120	4.31	.359			
5 - 10 years	136	4.42	.353	.388	3.042	.049
more than 10 years	44	4.37	.365			
Total	**300**	**4.37**	**.359**			

Table 5.6d: Perceptions of the instructors with respect to level of use of cloud computing services at their institution on total average scale of TOE framework

	N	Mean	Std. Deviation	Mean Square	F	p
Less than 5 years	120	4.52	.283			
5 - 10 years	136	4.61	.267	.250	3.223	.041
more than 10 years	44	4.55	.302			
Total	**300**	**4.57**	**.281**			

5.7 Relationship between the Sub-dimensions of SWOT and TOE

For a better understanding of the relationship between SWOT and TOE sub-dimensions of the perceptions of instructors, Pearson correlation analysis was also employed. The result shown in Table 5.7a in the same Table 5.7a, the strongest correlation was confirmed between DC – OCC (correlation coefficient = 0.699) followed by DC – MS (correlation coefficient = 0.589) in that order. These values indicate high dependence between the pairs. That is to say with high increase in DC there will be a high increase in OCC, and same goes for, a high level of DC, there will be a high increase in MS. The results shown below in Table 5.7b, there is a positive relationship between SWOT and TOE sub-dimensions, the correlation coefficient is 0.274 and it's significant at the 0.01 significant level.

Table 5.7a: Relationship between the sub-dimensions of SWOT and TOE

	SCC	WCC	OCC	TCC	RA	CO	CX	MS	VL	DC	GR
SCC	1										
WCC	-.027	1									
OCC	-.094	.140*	1								
TCC	-.068	.025	.500**	1							
RA	-.113	.010	**.298****	**.255****	1						
CO	-.060	.059	-.091	-.091	-.024	1					
CX	-.095	-.042	-.099	**-.131***	-.097	.432**	1				
MS	-.081	**.129***	**.591****	**.439****	.185**	-.097	-.106	1			
VL	-.040	.020	-.057	-.046	.021	-.159**	-.126*	-.026	1		
DC	-.070	.108	**.699****	**.331****	.098	-.213**	-.140*	.589**	-.041	1	
GR	**-.126***	.003	.058	.008	.151**	-.139*	-.162**	.038	.575**	.047	1

* Correlation is significant at the 0.05 level (2-tailed)

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

There was a weak uphill (positive) linear relationship between RA and OCC which showed a significant effect between both variable. Has shown in the scatterplot in Figure 5.1a summarizes this finding which indicates that the correlation weak, that's means has RA increases OCC increases (Callaghan, 2016).

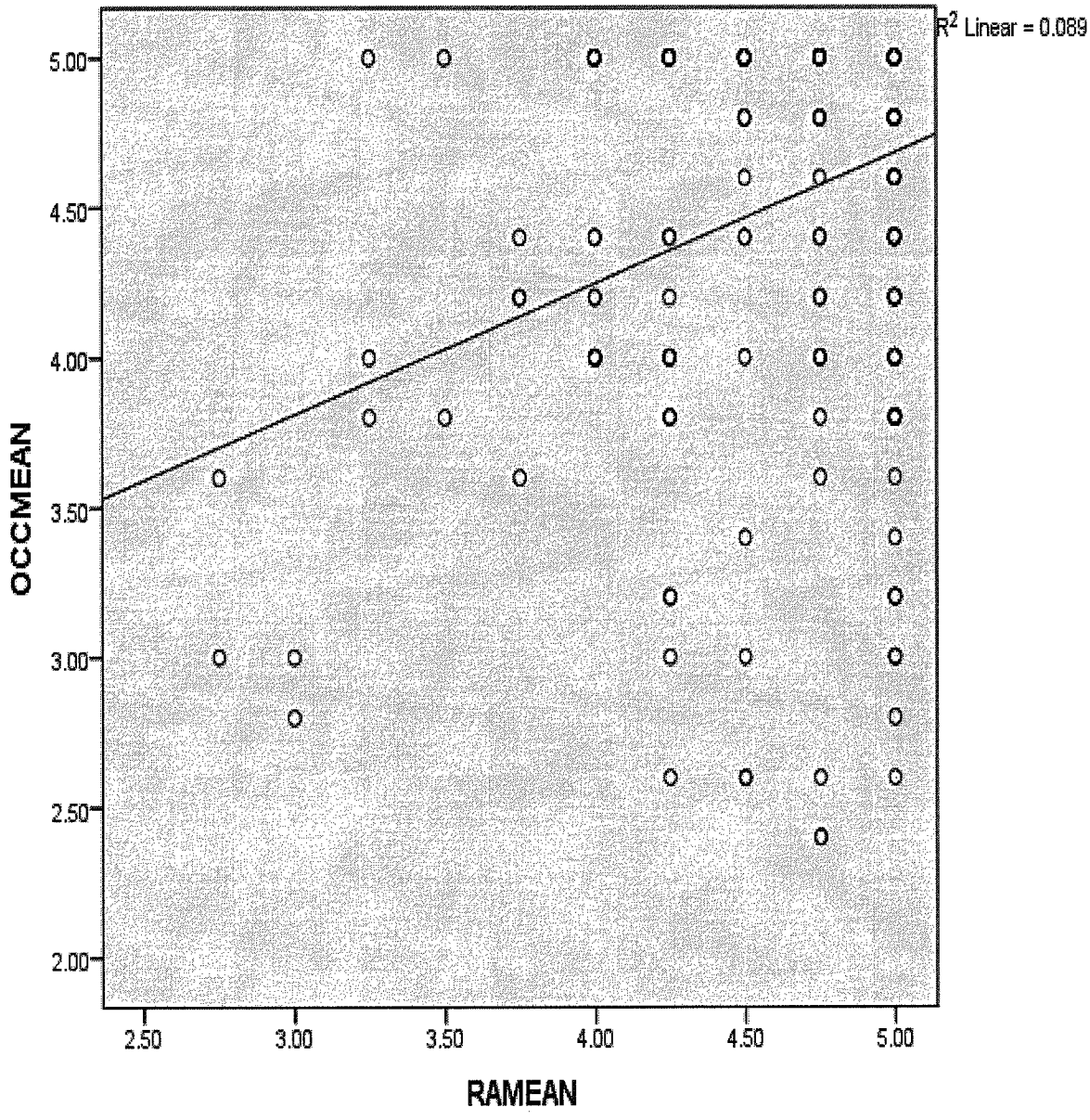

Figure 5.1a: Scatterplot of RA and OCC

There was a weak uphill (positive) linear relationship between RA and TCC which showed a significant effect between both variable. Has shown in the scatterplot in Figure 5.1b summarizes this finding which indicates that the correlation weak, that's means has RA increases TCC increases (Callaghan, 2016).

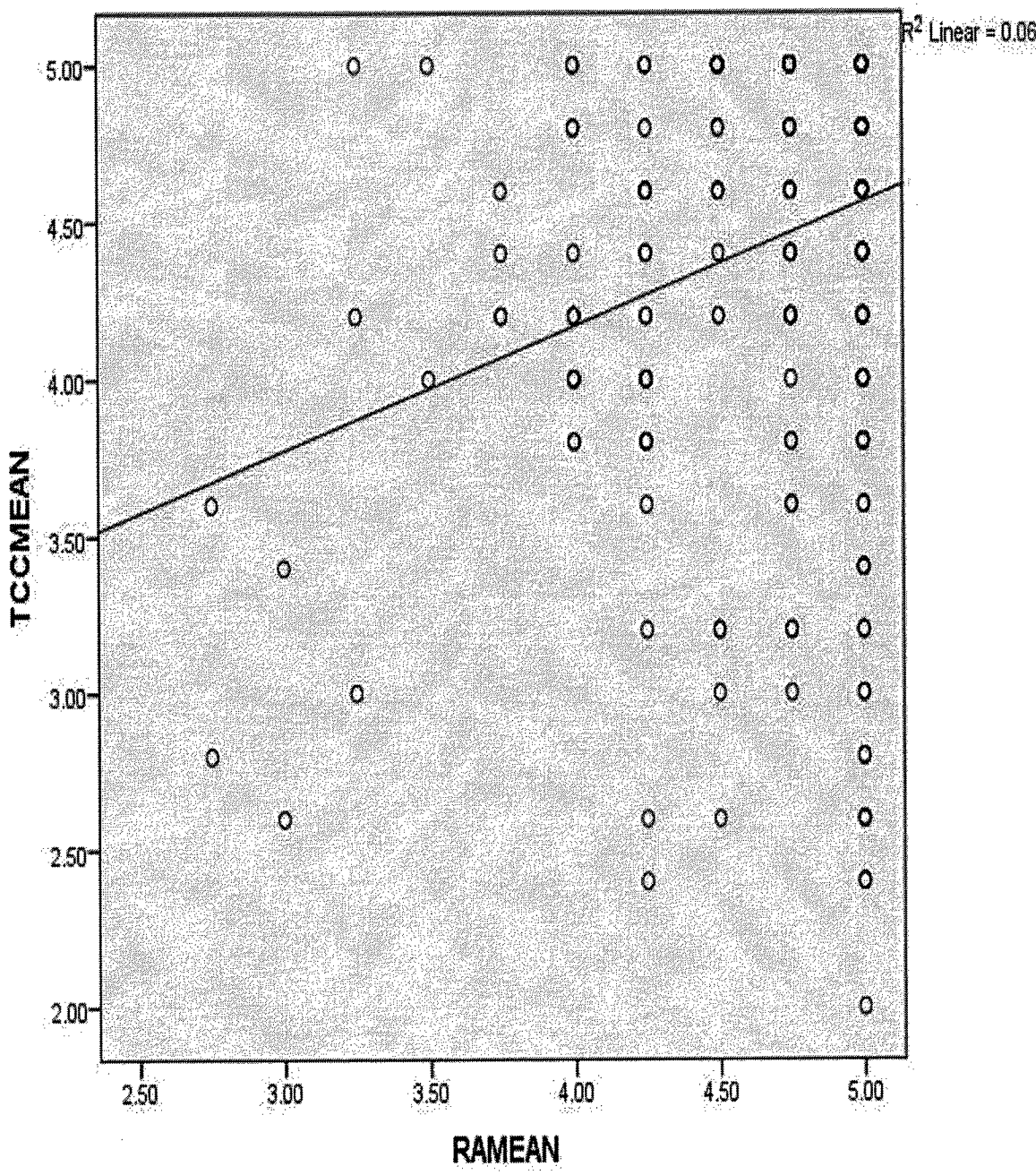

Figure 5.1b: Scatterplot of RA and TCC

There was a weak uphill (positive) linear relationship between MS and WCC which showed a significant effect between both variable. Has shown in the scatterplot in Figure 5.1c summarizes this finding which indicates that the correlation weak, that's means has MS increases WCC increases (Callaghan, 2016).

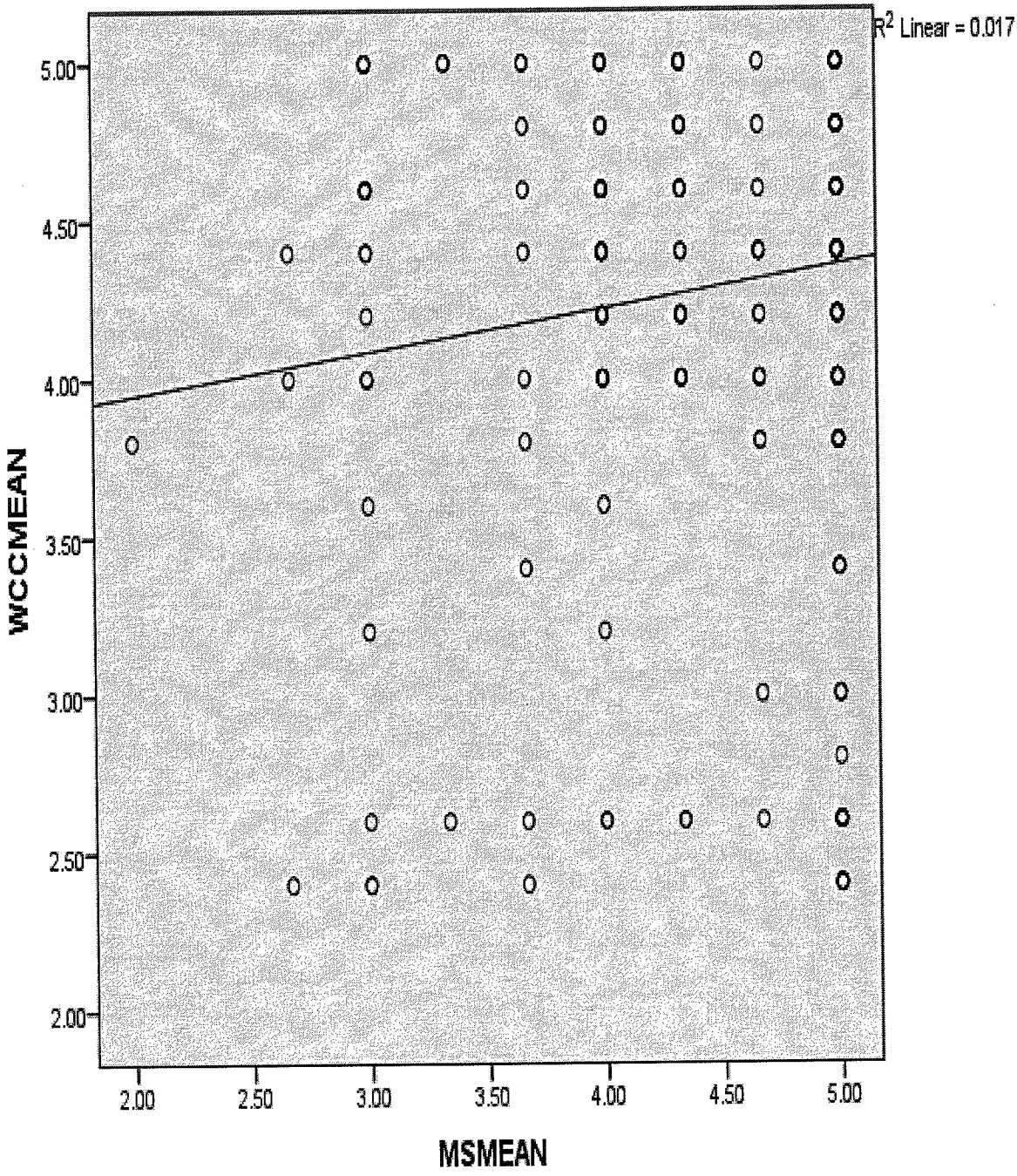

Figure 5.1c: Scatterplot of MS and WCC

There was a weak uphill (positive) linear relationship between MS and OCC which showed a significant effect between both variable. Has shown in the scatterplot in Figure 5.1d summarizes this finding which indicates that the correlation weak, that's means has MS increases OCC increases (Callaghan, 2016).

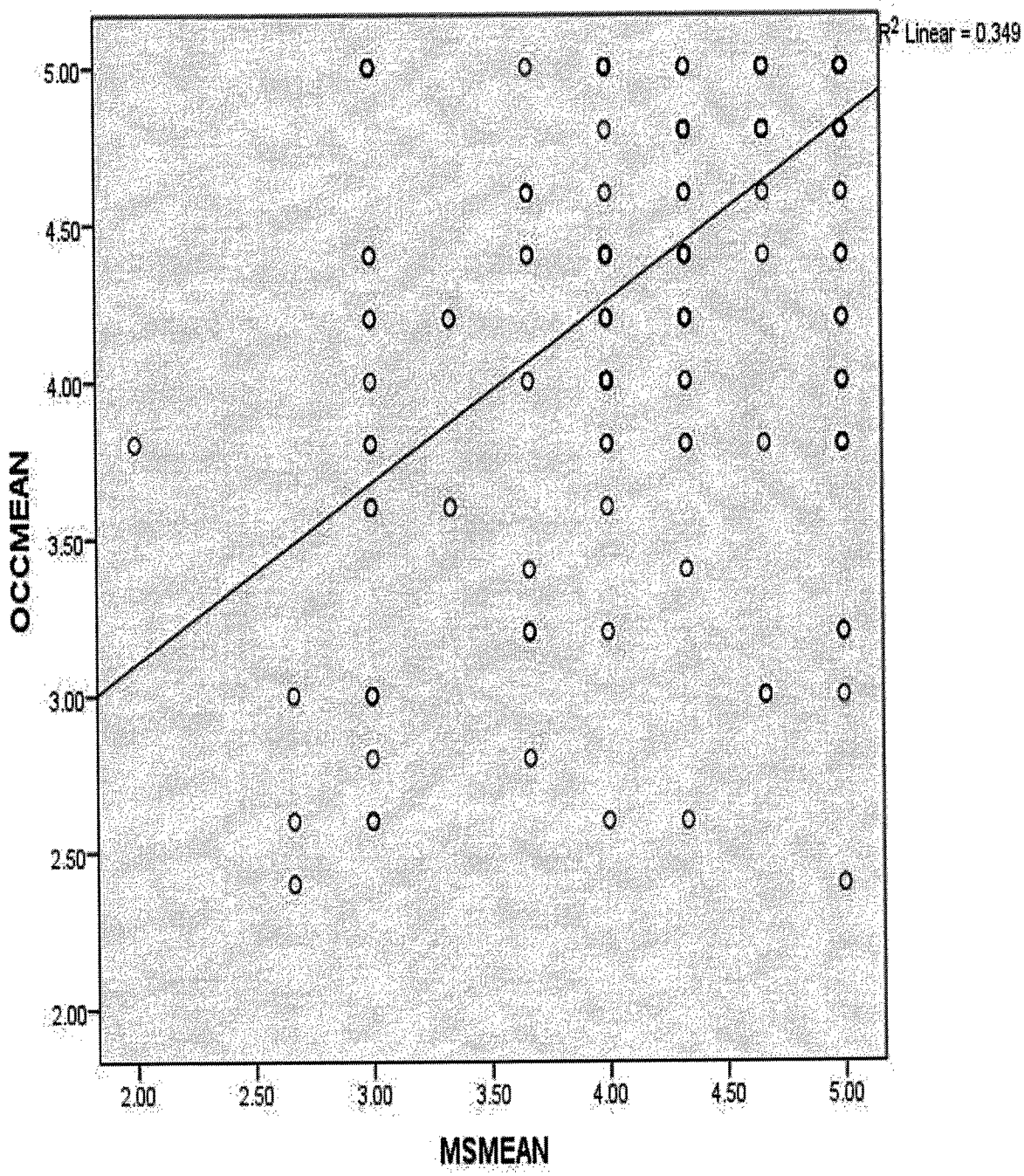

Figure 5.1d: Scatterplot of MS and OCC

There was a weak uphill (positive) linear relationship between MS and TCC which showed a significant effect between both variable. Has shown in the scatterplot in Figure 5.1e summarizes this finding which indicates that the correlation weak, that's means has MS increases TCC increases (Callaghan, 2016).

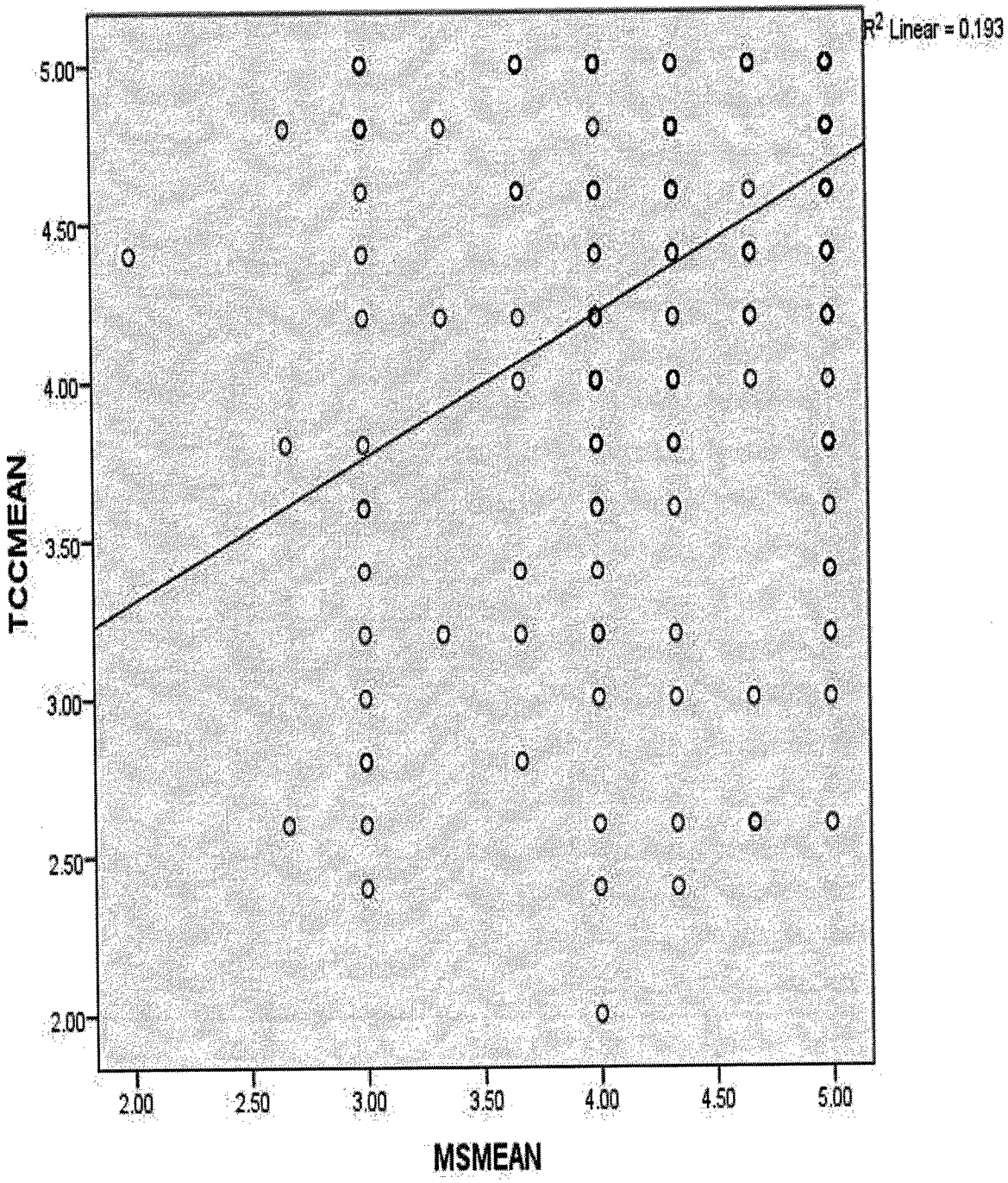

Figure 5.1e: Scatterplot of MS and TCC

There was a moderately uphill (positive) linear relationship between DC and OCC which showed a significant effect between both variable. Has shown in the scatterplot in Figure 5.1f summarizes this finding which indicates that the correlation weak, that's means has DC increases OCC increases (Callaghan, 2016).

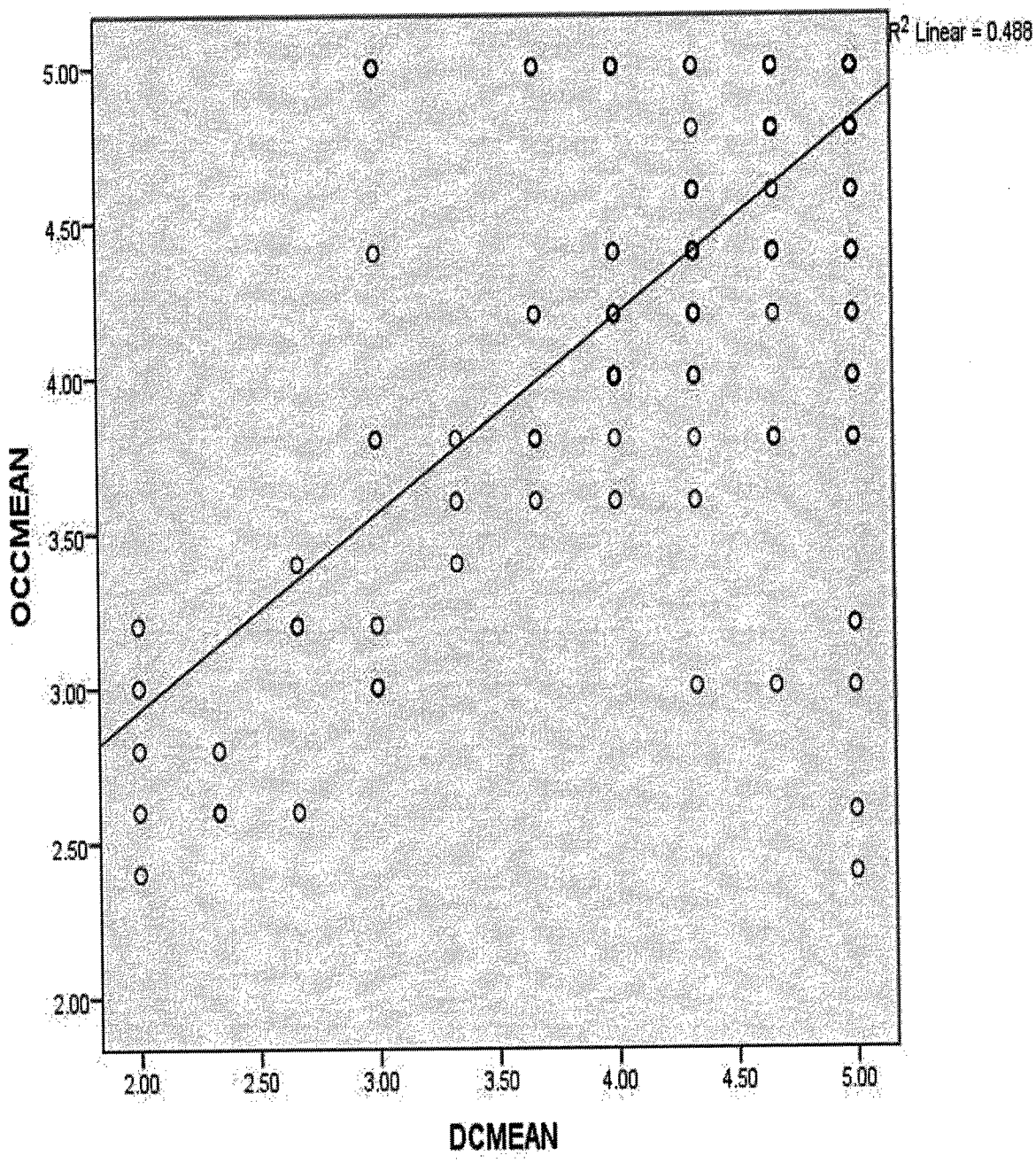

Figure 5.1f: Scatterplot of DS and OCC

There was a weak uphill (positive) linear relationship between DC and TCC which showed a significant effect between both variable. Has shown in the scatterplot in Figure 5.1g summarizes this finding which indicates that the correlation weak, that's means has DC increases TCC increases (Callaghan, 2016).

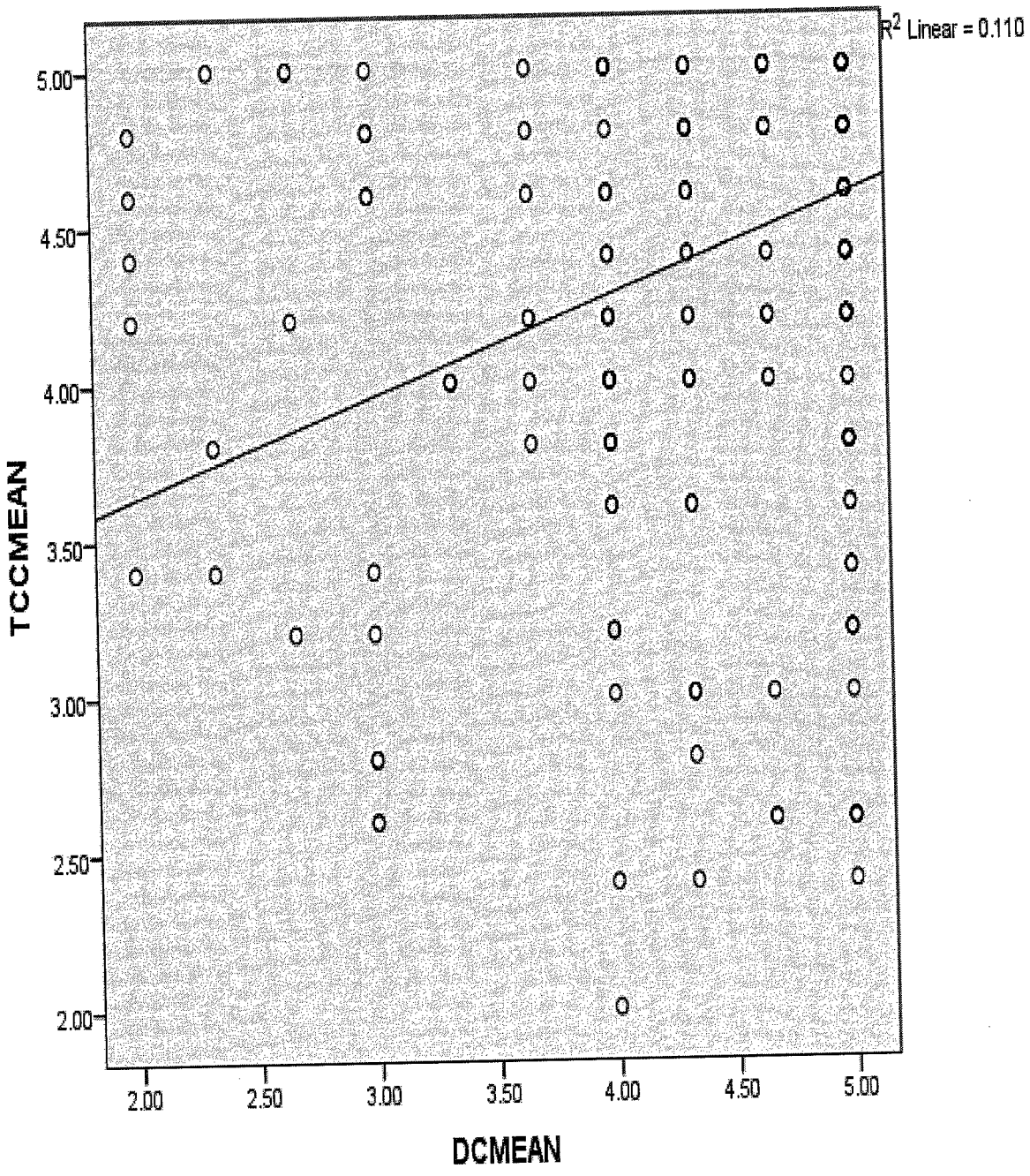

Figure 5.1g: Scatterplot of DC and TCC

There was a weak downhill (negative) linear relationship between CX and TCC which showed a significant effect between both variable. Has shown in the scatterplot in Figure 5.1h summarizes this finding which indicates that the correlation weak, that's means has CX increases TCC increases (Callaghan, 2016).

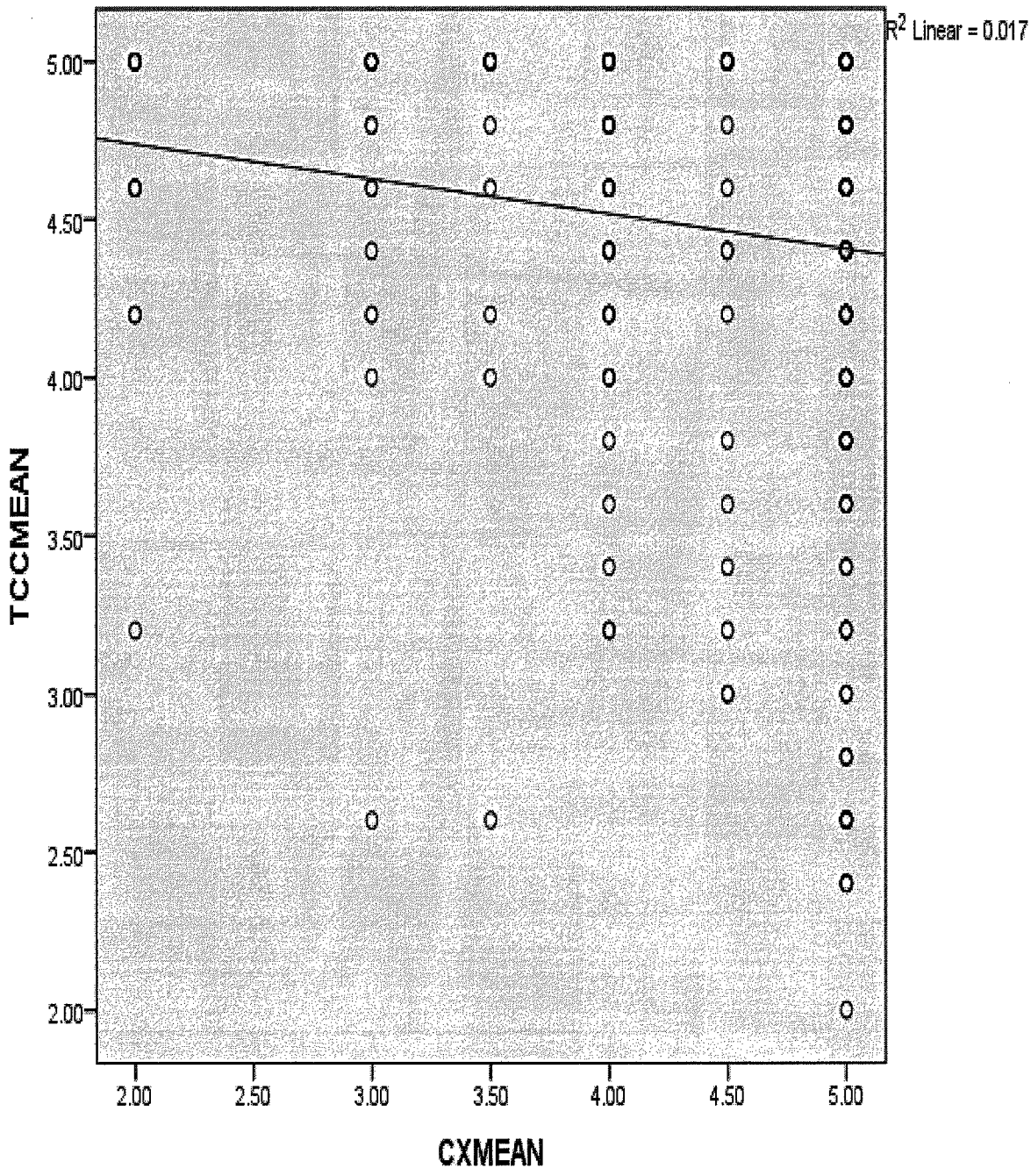

Figure 5.1h: Scatterplot of CX and TCC

There was a weak downhill (negative) linear relationship between GR and SCC which showed a significant effect between both variable. Has shown in the scatterplot in Figure 5.1i summarizes this finding which indicates that the correlation weak, that's means has GR increases SCC increases (Callaghan, 2016).

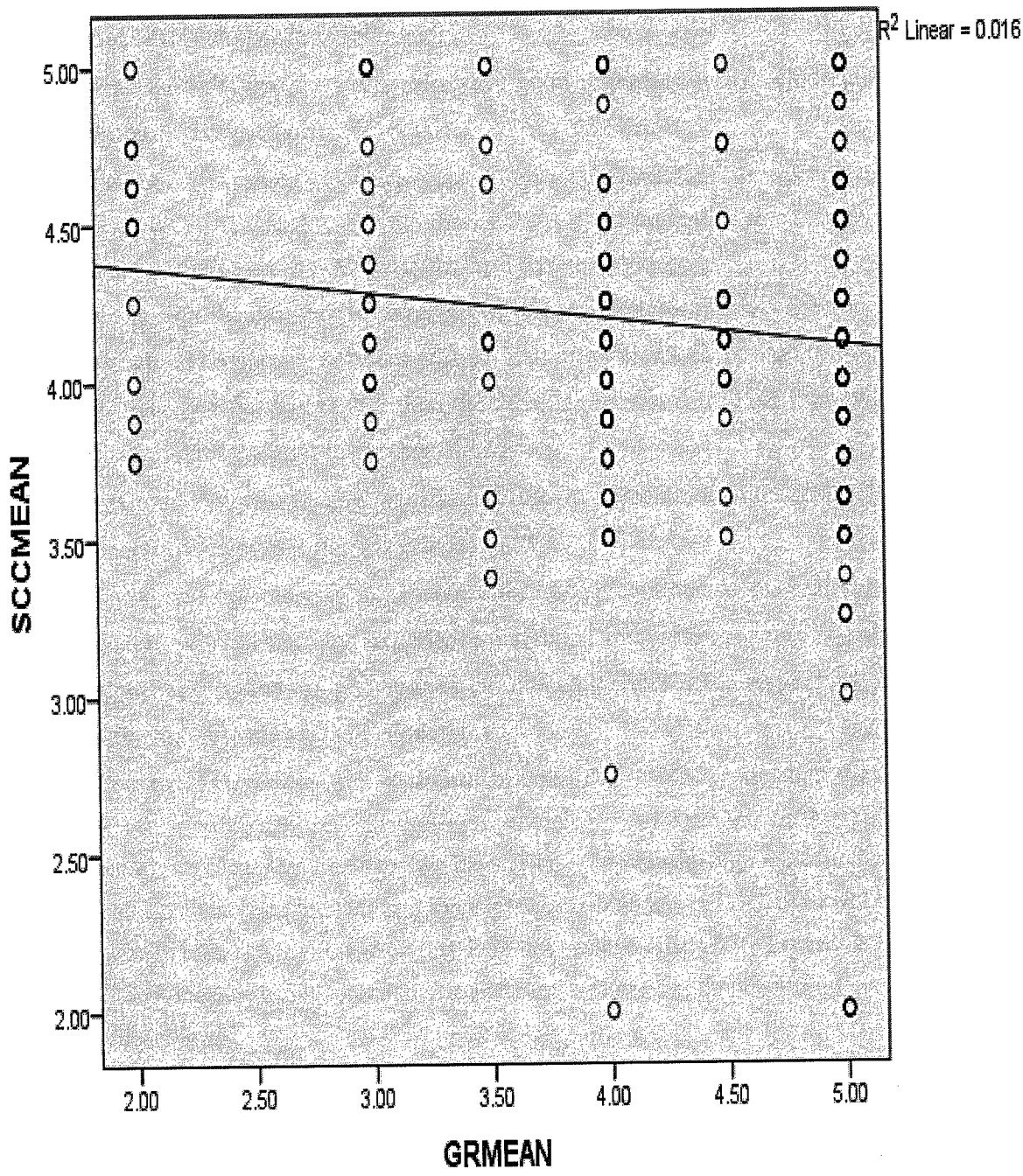

Figure 5.1i: Scatterplot of GR and SCC

CHAPTER 6
CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

The outcomes of this study are as follows;

- It was found out that the instructors gave good response towards cloud computing adoption in both regions.
- It was found that there was a significant differences between in both regions only existed in SCC, WCC, TCC and RA. In all dimensions RA had the highest score under Northern Cyprus and the least was SCC under Northern Cyprus.
- There is significant effect of perceptions of the instructors with respect to level of use of cloud computing services at their institution in WCC. In SWOT framework; OCC was significantly higher than the other dimensions. In TOE framework; RA was significantly higher than other dimensions.
- It was found out there was a significant effect of perceptions of the instructors with respect to years of teaching experience in SCC.
- It was found out there is significant effect of perceptions of the instructors with respect to years of teaching experience on SWOT total average score and also there is significant effect of perceptions of the instructors with respect to years of teaching experience on TOE framework.
- The strongest correlation was confirmed between DC – OCC (correlation coefficient = 0.699) followed by DC – MS (correlation coefficient = 0.589) in that order. These values indicate high dependence between the pairs. That is to say with high increase in DC there will be a high increase in OCC, and same goes for, a high level of DC, there will be a high increase in MS. The results shown that there is a positive relationship between SWOT and TOE sub-dimensions, the correlation coefficient is 0.274 and it's significant at the 0.01 significant levels.

6.2 Recommendations

Future exploration bearings and proposal for the protected utilization of PC and the Internet security may incorporate the accompanying:

- This study can be rehashed in various eras and assess the advancement and change of the noteworthy elements.
- It is likewise prescribed to incorporate extra variables identified with the data transmission accessibility and dependability of the innovation.

Keeping in mind the end goal to build the acknowledgment of cloud computing, it is important to take measures are:

- Clear rules in managing the administration supplier.
- Secure information, appropriateness.
- Contact more solid Internet.

It is prescribed that multi answers for conquer the dangers and exploit opportunities:

- Enforce protection and security strategies.
- Impose control and counteractive action of bamboozling in exams and appraisals techniques

It is prescribed that higher establishment ought to put resources into innovation cloud computing.

- Reduce the computerized isolate using cloud computing innovation.
- Erase specialized lack of education.
- Encourage research, which means to give training open to everybody utilizing PCs.
- It is likewise suggested that this study will advantage the colleges powers to know how to receive cloud computing in their establishment.

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APPENDICES

APPENDIX A

CLOUD COMPUTING ADOPTION QUESTIONNAIRE

The questionnaire aims to investigate faculty members' perceptions on cloud computing adoption. This is a part of Master's thesis project. The result of this questionnaire will solely be used for thesis, for writing academic articles, and any information about the identity of the participants will be kept confidential.

Thanks in advance for taking time to answer the questionnaire. For more information please contact the researcher:

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SECTION I: Personal Information (please tick the box most appropriate for you)

1) Gender □ Male □ Female
2) Age □25-27 □ 28-30 □ 30+
3) Department: _____
4) Academic title: □Master / PhD□Assist. Prof.□Assoc. Prof.□ Prof.
5) How many years have you been working at this institution?
   □< 5years□5-10 years□ > 10 years
6) Years of teaching experience:
   □ < 5years□5-10 years□> 10 years

SECTION II: Cloud computing Usage

7) **Select from below the status of your institution in adopting cloud computing?**

□ Not considering
□ Have evaluated, but not planning to adopt cloud computing
□ Currently evaluating cloud computing
□ Have evaluated and planning to adopt cloud computing
□ Have already adopted cloud computing

8) **Select the status of IT resources/services from below** (please tick the plan that applies to you):

IT resources/services	**Hosted**	**Plan to host**	**No plan**
E-mail			
Learning management systems (e.g. Blackboard, Moodle,Edmodo etc…)			
Library system			
University/college website or portal			
File backup and storage			
Online collaboration or conferencing			
Student record system			
File sharing			
Office productivity suite (e.g. Office 365)			
ERP(Enterprise resource planning) system			

Project management system			
Virtual lab environment			

SECTION III: Cloud computing is a type of computing that relies on *sharing computing resources* rather than having local servers or personal devices to handle applications (please tick the most appropriate to you for each question).

Items	Strongly Disagree	Disagree	No Idea	Agree	Strongly Agree
STRENGTHS OF CLOUD COMPUTING					
Cloud computing offers:					
1.reduced cost					
2.learning at one's convenience (any place, any time, any device)					
3.backup and recovery of learning materials					
4.Elasticity					
5.good performance					
6.simplicity of implementation					
7.increased storage capacity					
8.The use of various devices					
WEAKNESSES OF CLOUD COMPUTING					
Cloud computing:					
9.depends on high-level service provider					
10.has technical difficulties and downtime					
11.offers limited control and flexibility					
12.offers risks of unavailability					
13.has low level of data verification					
OPPORTUNITIES OF CLOUD COMPUTING					
Cloud computing offers:					
14.high level of interactive and collaborative learning					
15.intelligent environments with knowledge building capability					
16.highest possible integration and sharing of knowledge					
17.paperless and digital learning experience					
18.high data storage capacity and availability of resources					
THREATS OF CLOUD COMPUTING					
Cloud computing has:					
19.data security issues					
20.customer lock in (makes a customer dependent on a supplier for products and services, unable to use another supplier without substantial switching costs) issues					
21. unwanted advertising					

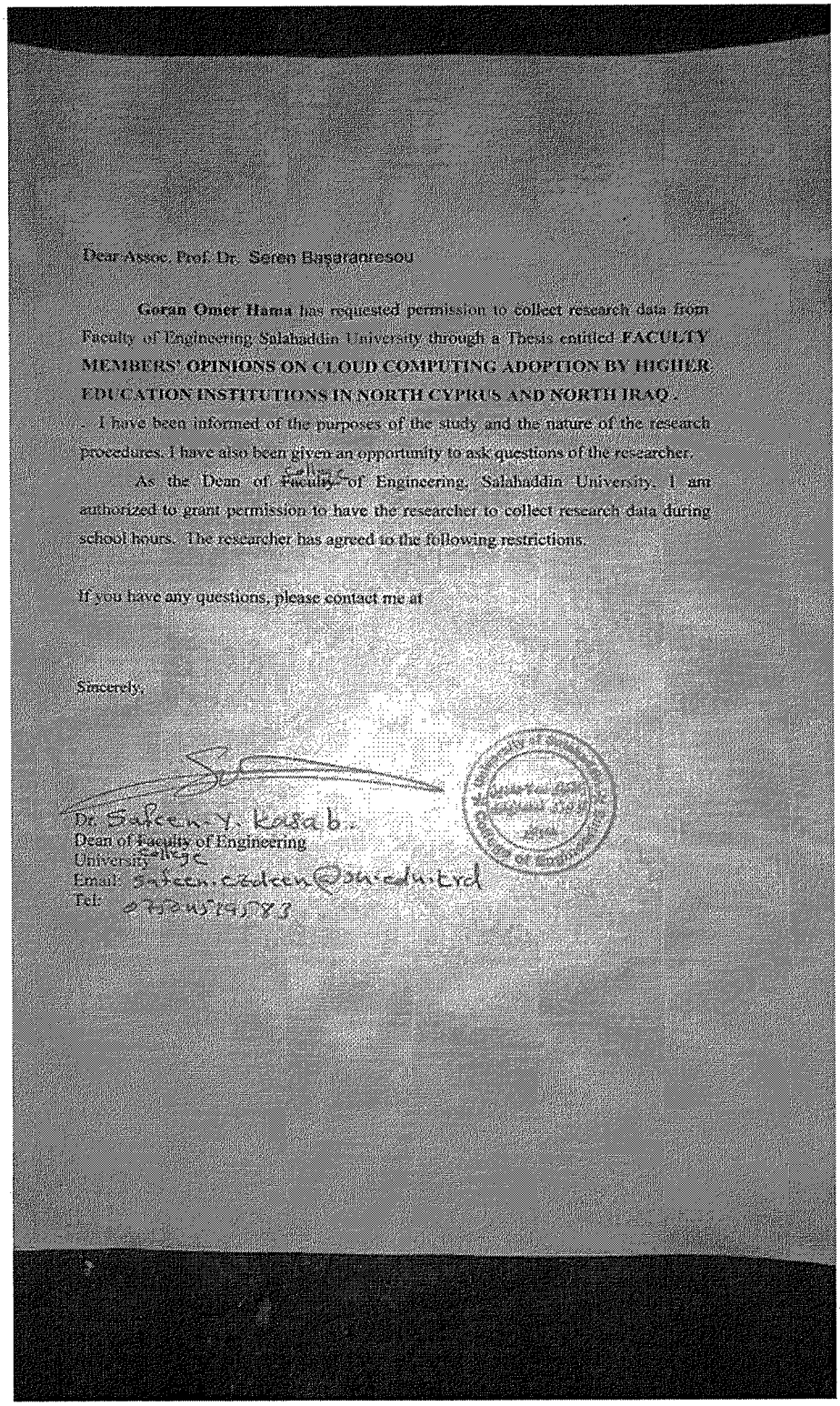
22.management issues					
23.Policy and Control Issues					

	Strongly Disagree	Disagree	No Idea	Agree	Strongly Agree
TECHNOLOGY					
RELATIVE ADVANTAGE (RA)					
1.Cloud computing can shorten Information Systems deployment time					
2.Cloud computing allows us to perform specific tasks more quickly					
3.Cloud computing can reduce IT expenses					
4.Cloud computing offers new educational and research opportunities					
COMPATIBILITY (CO)					
5.Cloud Computing is compatible with our academic institution's operations					
6.Cloud Computing is compatible with our IT infrastructure					
7.Cloud Computing is compatible with our academic institution's culture and values					
COMPLEXITY (CX)					
8.The skills needed to implement cloud computing are too complex for our institution					
9.The skills necessary to using cloud computing are too complex forme					
10.The use of cloud computing is frustrating					
VENDOR LOCK-IN					
11.Cloud computing authorizes the use of specific IT resources					
12.Cloud computing make us dependent on the provider services					
13.Cloud computing restricts the ability to switch to another provider					
14.The switching cost to another cloud computing provider is high					
DATA CONCERN (DC)					
I am concerned:					
15.about the leakage of confidential data					
16.that unauthorized people may access our student and research data					
17.about storing our data in the cloud					
ORGANIZATION					
MANAGEMENT SUPPORT (MS)					
18.Top management provides resources for adopting cloud computing					

19.Top management supports the implementation of cloud computing					
20.Top university management understands the benefits of adopting cloud computing					
ENVIRONMENT					
GOVERNMENT REGULATION (GR)					
21.Government laws and regulations are sufficient to protect the use of cloud computing					
22.Governmentlaws and regulations to facilitate the use of cloud computing					

Thank you for your cooperation!

APPENDIX B:UNIVERSITIES' LETTER OF PERMISSIONS



Dear Assoc. Prof. Dr. Seren Basaranresou

Goran Omer Hama has requested permission to collect research data from Faculty of Engineering Salahaddin University through a Thesis entitled **FACULTY MEMBERS' OPINIONS ON CLOUD COMPUTING ADOPTION BY HIGHER EDUCATION INSTITUTIONS IN NORTH CYPRUS AND NORTH IRAQ.**

I have been informed of the purposes of the study and the nature of the research procedures. I have also been given an opportunity to ask questions of the researcher.

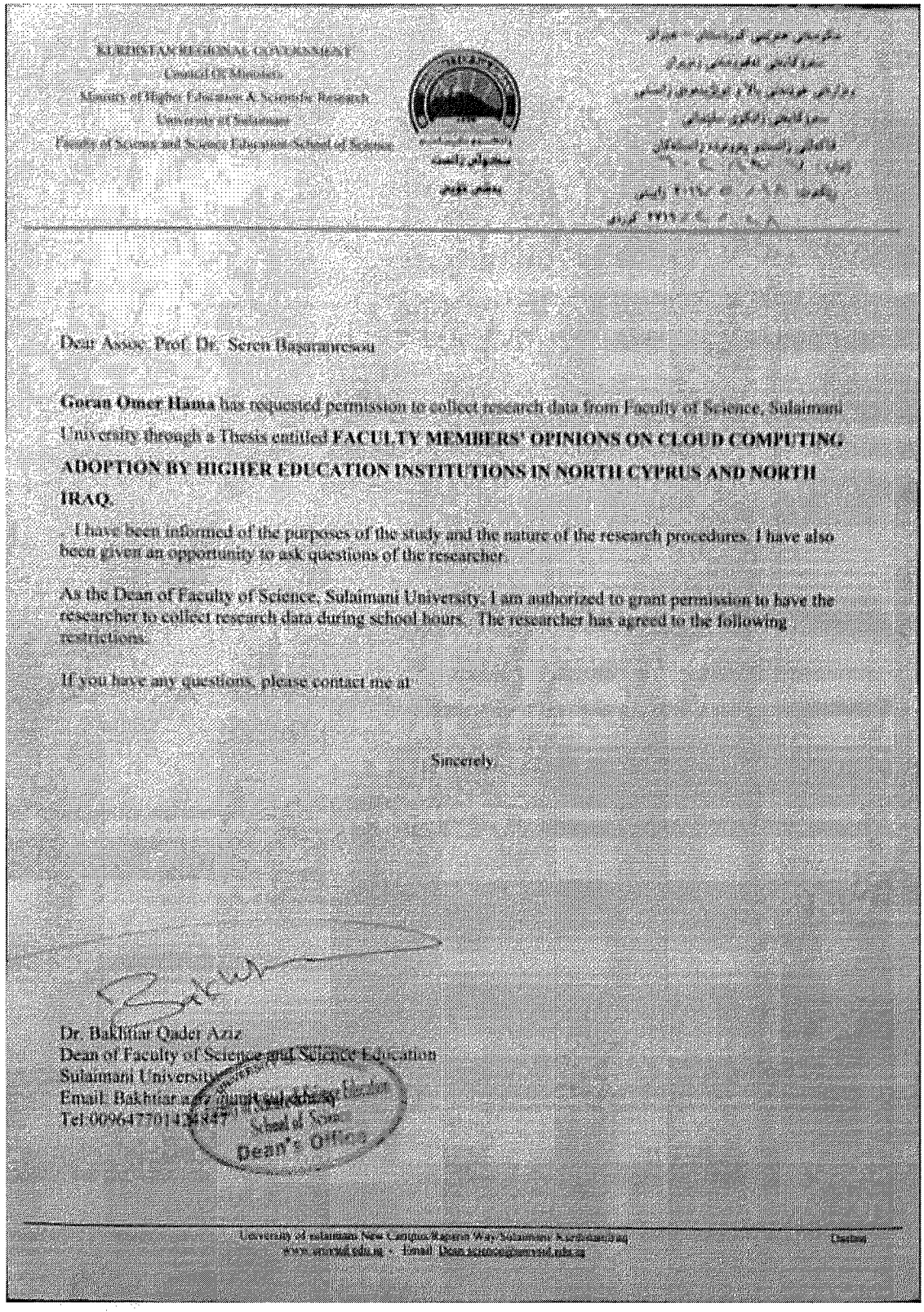
As the Dean of ~~Faculty~~ College of Engineering, Salahaddin University, I am authorized to grant permission to have the researcher to collect research data during school hours. The researcher has agreed to the following restrictions.

If you have any questions, please contact me at

Sincerely,

Dr. Safeen Y. Kasab.
Dean of Faculty of Engineering
University College
Email: safeen.ezdeen@su.edu.krd
Tel: 07504019083

Appendix B: Continued…



KURDISTAN REGIONAL GOVERNMENT
Council Of Ministries
Ministry of Higher Education & Scientific Research
University of Sulaimani
Faculty of Science and Science Education/School of Science

Dear Assoc. Prof. Dr. Seren Başaranerson

Goran Omer Hama has requested permission to collect research data from Faculty of Science, Sulaimani University through a Thesis entitled **FACULTY MEMBERS' OPINIONS ON CLOUD COMPUTING ADOPTION BY HIGHER EDUCATION INSTITUTIONS IN NORTH CYPRUS AND NORTH IRAQ.**

I have been informed of the purposes of the study and the nature of the research procedures. I have also been given an opportunity to ask questions of the researcher.

As the Dean of Faculty of Science, Sulaimani University, I am authorized to grant permission to have the researcher to collect research data during school hours. The researcher has agreed to the following restrictions.

If you have any questions, please contact me at

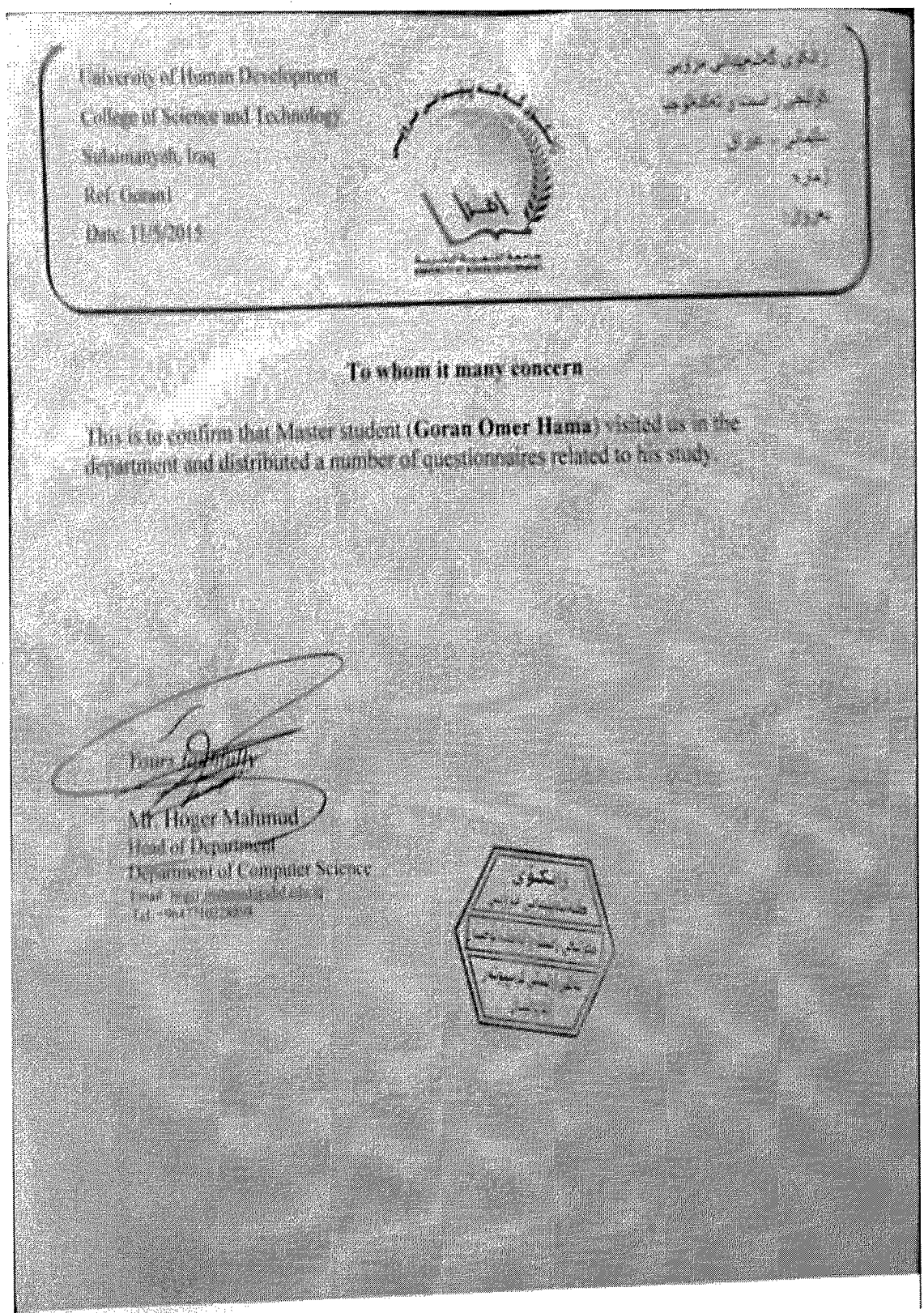
Sincerely

Dr. Bakhtiar Qader Aziz
Dean of Faculty of Science and Science Education
Sulaimani University
Email: Bakhtiar.aziz@univsul.edu.iq
Tel 009647701423847

Dean's Office

University of sulaimani New Campus Raperin Way Sulaimani Kurdistan/Iraq
www.univsul.edu.iq - Email: Dean.science@univsul.edu.iq

Appendix B: Continued…



University of Human Development
College of Science and Technology
Sulaimanyah, Iraq
Ref: Ganml
Date: 11/5/2015

To whom it many concern

This is to confirm that Master student (**Goran Omer Hama**) visited us in the department and distributed a number of questionnaires related to his study.

Mr. Hoger Mahmod
Head of Department
Department of Computer Science

Appendix B: Continued…

KURDISTAN REGIONAL GOVERNMENT
Ministry of Higher Education and
Scientific Research
Sulaimani Polytechnic University
Technical College Of Informatics

Dear Assoc. Prof. Dr. Seren Başaranresou

Goran Omer Hama has requested permission to collect research data from Faculty of Science, Sulaimani University through a Thesis entitled **FACULTY MEMBERS' OPINIONS ON CLOUD COMPUTING ADOPTION BY HIGHER EDUCATION INSTITUTIONS IN NORTH CYPRUS AND NORTH IRAQ**.

I have been informed of the purposes of the study and the nature of the research procedures. I have also been given an opportunity to ask questions of the researcher.

As the Head of Database Technology Department/ Technical College of Informatics, I am authorized to grant permission to have the researcher to collect research data during school hours. The researcher has agreed to the following restrictions.

If you have any questions, please contact me at.

Sincerely,

Dr. Eng. Alaa K. Jumaah
Head of Database Technology Department
Technical College of Informatics
Sulaimani Polytechnic University
Email: alaa_alhadithy@yahoo.com
Tel: 00964 7705 414 799

18/5/2016