An Assessment of Attitudes and Perceptions of Undergraduate IT Students on Mobile Information Literacy in Pakistan

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ABSTRACT

The thesis has been conducted to assess the attitudes and perceptions of Undergraduate IT student in Pakistan regarding mobile information literacy in terms of their age, gender and year of study. Four sub-divisions form the basis of the study; Informationally Literate University, Informationally Literate Person, Framework of Information Literacy and ICT and Students. The study is quantitative in nature and makes use of survey questionnaire on Mobile Information Literacy (MIL) as the data collection tool. The sample size consists of five hundred registered bachelor students from IT department at Comsats University in Pakistan have contributed in the survey willingly. The method for data analysis used is descriptive and has been conducted using Arithmetic mean (X), Frequency (f), Percent (%), Post Hoc Test, Anova test and Independent T-test.

Findings show positive perceptions of the students about mobile information literacy and no serious difference is seen between MIL as showed by age direction. Conversely, major difference is seen between the gender and year of study level of the students about MIL, which shows that a relationship exists between undergraduate IT students' gender, year levels and MIL. The female students showed higher level perceptions regarding literacy of mobile information as compared to male students. The 1st year students showed high levels of perceptions for mobile learning while the 3rd year IT students showed the lowest level of perceptions towards mobile information literacy.

Keywords: Student's Attitude, Student's Perceptions, Technology Literacy.

ÖZ

Bu çalışma, Pakistan'daki Bilişim Teknolojileri (BT) lisans öğrencilerinin Mobil Bilgi Okuryazarlığı (MBO) konusundaki tutum ve algılarının, üniversite içerisindeki bilgi okuryazarlığı alt bölümleri temelinde yaş, cinsiyet ve öğrenim yılı açısından değerlendirilmesini incelemek amacıyla yapılmıştır. Araştırma, kantitatif araştırma ve anket yöntemi kullanılarak yapılmış ve veri toplama aracı olarak kullanılan anket çalışması MBO üzerinedir, ve Pakistan Comsats Üniversitesi Bilgisayar Mühendisliği, Yazılım Mühendisliği ve BT Bölümlerine uygulanmıştır. Pakistan'daki Comsats Üniversitesi'nin BT ve Bilgisayar Mühendisliği ve Yazılım Mühendisliği bölümlerinden 500 kayıtlı lisans öğrencisi ankete gönüllü olarak katıldı. Toplanan veriler üzerinde Betimsel Analiz kullanıldı. Verilerin analizi Frekans (f), yüzde (%), Aritmetik ortalama (X), Tek Yönlü Anova kullanılarak ve T-testi yapılmıştır.

Bulrgular, BT lisans öğrencilerinin çoğunluğunda MBO konusunda önemli ölçüde yüksek algı seviyeleri oluşturduğunu, yaş ve cinsiyet yönüne göre öğrenciler üzerinde ciddi bir fark oluşturmadığını gösterdi. Tersine, öğrencilerin öğrenim yılına göre mobil bilgi okuryazarlığı düzeyleri arasında büyük bir fark vardır; bu, lisans BT öğrencilerinin yıl seviyeleri ile mobil bilgi okuryazarlığı arasında, mobil öğrenmeye yönelik yüksek düzeyde algı gösteren 1. sınıf öğrencileri arasında bir ilişki olduğunu göstermektedir. 3. sınıf BT öğrencileri, mobil bilgi okuryazarlığı konusunda çok az bir algı seviyesi farkı gösterdiler.

Anahtar Kelimeler: Öğrencinin Tutumu, Öğrencinin Algısı, Teknoloji Okuryazarlığı.

DEDICATION

I would like to start with the name of ALLAH Almighty for giving me enough energy, knowledge and resources to work on the challenges that I have faced and be successful.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

ACRL	Association College Research Libraries
AWKUM	Abdul Wali Khan University Mardan
CUI	Comsats University Islamabad
ETS	Educational Testing Service
ICT	Information & Communication Technologies
IL	Information Literacy
IT	Information Technology
ML	Mobile Literacy
MIL	Mobile Information Literacy
MLL	Mobile Language Learning
SAS	Statistical Analysis System
SPSS	Statistical Packages for Social Sciences
TAM	Technology Acceptance Model
TAM	Technology Adoption Model
TACI	Technology Adapter Category Index
TESOL	Teaching English to Speakers of Other Languages
TRNC	Turkish Republic of Northern Cyprus
UTAUT	Unified Theory of Acceptance & Use of Technologies

Chapter 1

INTRODUCTION

Nowadays, world is moving towards advancements in technology. Due to rapid development of technology, students of 21st century are completely dependent on technology and media. However, to understand how beneficial these advancements are to the Pakistani youth, we still have to know the literacy rate of the students regarding mobile information and what their perceptions are about mobile information literacy (MIL). The thesis aims to assess the behavioral approach of undergraduate IT students and their perceptions about a learning environment. Just how we can relate mobile technologies to accessing information, we can also consider them under the framework of information literacy (IL). Mobile technologies have taken over our lives completely especially the young generation under 30. The most recent generation of students, also called digital natives are integrating mobile applications, social networks and mobile resources in their daily life. In Pakistan, youngsters aged 15-30 are consulting smart phones to manage information. Even though these mobile devices are useful and easily accessible for the learners and ways of interaction have increased successfully due to mobile applications, we still need to check the information competencies of the students.

Previously, the methods of accessing and using data and information changed severely. Our access to current affairs, emails, news, local libraries has shifted from desktop computer to our fingerprints with mobile devices like smart phones and

tablets etc. Our daily lives have become integrated with mobile devices and their vast use has also has an impact on the education side as well. MIL plays a significant part in the education and learning process of learners. Users using internet on mobile phones are mostly students within the overall smartphone owners. Along with information and data transfer, MIL is impacting the behaviors and attitudes of today's and future learners (Havelka, 2013).

IL is capable of locating, accessing, contacting and using available data in all types of education and educational settings. Learning important IL skills via mobile devices is the latest development that is taken into consideration by higher educational institutes for undergraduate and all levels of academic learning. In Australia, England and USA there are colleges and universities that offer programs which introduce IL and ICT into the learning practices (Hanbidge et al., 2015).

According to Manuguerra & Petocz (2011), teachers from universities need to integrate new approaches in education that include the latest technology and internet to communicate with individuals directly or in class because today's users are a generation of internet and technology. It was further stated that mobile learning is the next development after e-learning. Tools like these can potentially modify the fundamentals of the teaching learning process much like when the first personal computer was developed and gave teachers and students new way of composing documents, solving mathematical tasks and storing databases. Then, the format of delivering lectures inside the classroom changed from blackboards to projectors. So, the introduction of mobile learning gave students an ease of distance learning, a virtual place to access the content of the study and to participate in lectures.

IL and E-learning does have many disadvantages as well however, for example in comparison with face to face interaction, live communication does not exist in E-learning which can have a negative impact on the progress of the learners. With information literacy, learners can sometimes access incorrect and invalid information on the internet which can cause difficulty for the learners if they are learning by themselves (Talebian et al., 2014).

IL is offered to the learners who are willing to learn the information determining their behavior towards mobile information literacy because it is not a usual type of classroom substance. Both educators and learners need to learn new information literacy skills to use the daily varying technologies (Hanbidge et al., 2015).

Technological growth allows education to the learners through ML curriculums in different geographical locations and it increases interaction between learners and educators. Integration of distance education has different methods from country to country because all these learning methods are based on technology available in that particular geographic location and available resources. E-learning or mobile learning can be beneficial for many students who are not able to afford traditional education financially, physically or geographically. The students are very fond of learning and using all sources of mobile learning (laptops, tablets and smart phones) so that they can access information anytime and anywhere. Mobile learning techniques can engage students in their learning process much better than traditional education methods. It has changed students behavior from passive learners to active learners and made them mentally and psychologically involved in their education content and tasks (Nassuora, 2013).

An essential aspect in finding the acceptance of mobile learning is learner's acceptance, and in universities, ML success depends on the learners acceptance level for the technology because at the end learner has to use the technology in his educational process. Students having advanced technology skills can perceive ML easily (Beutner & Pechuel, 2012).

The principle of being successful in personal lives as well as in professional lives demands students to be informationally literate and this principle is adopted by many. It is not necessary for the students to be informationally literate when they join universities. According to the study only 13% learners from college and 800 learners from high school tested as informationally literates. Most of the learners complete higher education without even learning these information literacy skills. According to students who receive guidance about information literacy skills do not learn or keep what they have been tought (Gross & Latham, 2009).

1.1 Problem Statement

Surveys conducted in 11 rising and developing countries transversely four worldwide regions find that a majority of students in these countries have mobile devices of some kind. A median of 53% of these countries now have access to a smart phone with the access of internet and running applications (Silver et al., 2019).

The way of accessing information and sharing data with traditional media has drastically changed to digital devices (like smart phones, notepads and tablets) that provide immediate access to almost everything. Mobile information technology has incorporated technology into learning process. Most of learners are unaware of thinking critically to consume and process the information they have been receiving

from mobile devices. The learners need to think critically to improve their literacy skills, to use mobile devices and to deliver training about IL.

MIL is important to help learners getting and checking the information quality that we receive online. Students also need to understand how to use online information effectively. Students send messages to their circle using mobile devices, they share information and data based on different topics but there is a need for them to understand information, they should be able to incorporate technology into learning process. This thesis has been done in Comsats University Islamabad (CUI) in Pakistan to understand the learners' attitudes and their awareness level about MIL. It will help to know about the perceptions of the students on how to deal with technology, how to use technology in learning process and how to think critically.

1.2 Aim of Study

The thesis aiming at accessing perceptions of undergraduate IT students from CUI based on their knowledge and information about mobile literacy in terms of their age, gender, level of study through the questionnaire. The questionnaire prepared on the tool Google forms was based on Mobile Technology and Information Literacy consisting of four sub-dimensions dealing with Informationally Literate University, Informationally Literate Person, Framework of IL and ICTs and Students.

1.3 Reasearch Questions

The thesis was done to know the answers to these questions:

1. How do IT students in Pakistan perceive informationally literate universities?
2. How do undergraduate IT students in Pakistan perceive informationally literate person?

3. What are the effects of using mobile devices in learning process on undergraduate IT students in Pakistan?
4. How do undergraduate IT students in Pakistan perceive information literacy?
5. What are the differences in usage behavior of mobile devices for educational purposes between Pakistani male and female undergraduate IT students?
6. What are the differences in usage behavior of mobile devices for educational purposes between underage (17 and under) and overage (18 and above) Pakistani undergraduate IT students?
7. What are the differences in usage behavior of mobile devices for educational purposes between year levels of undergraduate IT students in CUI?

1.4 Significance of Study

This study has given importance to the education field, learners and learning environment. It is an investigation of assessing students' perceptions about MIL based on their behavior about using technology in learning process. This study will examine whether there is a difference between MIL and students' age, gender, year of study and preferred teaching method.

1.5 Study Limitations

The study was time restricted because the survey about MIL has to be circulated in all students from IT department of CUI and data was collected by the investigator herself. Due to ongoing pandemic of COVID-19 one major limitation was data collection so the researcher designed the questionnaire online on Google forms and distributed the link to the students via Facebook, e-mail and Whatsapp.

Further limitations were the use of the method; quantitative method has been used so that the participants can give a brief thought about the perceptions of the students

about MIL. The limitation used for analyzing age factor was T-test and for year of study level and teaching method one-way ANOVA method and Post Hoc test limitation was used.

1.6 Definition of Research Key Terms

1.6.1 Students' Attitudes

Attitude can change every aspect of a student's life. It is a way feeling, liking and disliking of something. They are also called behaviors of students. It is a measure of students' positive and negative feelings towards any subject in terms of their ability and willingness to learn (Evans, 2007).

1.6.2 Students' Perceptions

Students' perceptions are their personal interpretation or recognition of information. Students take sensory information and then use that information to communicate. Perceptions affect our emotions and behaviors and they also control our reactions, we behave according to our perceptions (Chapin & Gleason, 2004).

1.6.3 Information Competencies

There is no particular definition of information competencies that is universally accepted, Dunn and Adamson (1995) defined information competencies as:

- To be familiar with the need of information,
- To obtain and assess information,
- To put in order and uphold information,
- To understand and communicate information,

so information competencies are basically definitions of information literacy.

1.6.4 Mobile Applications

Mobile application is a kind of software which is designed to work on selected device like tablet and mobile phone. This application offers many features to the user

to fulfill their needs. These applications should be interactive to the users. They are available on many platforms like IOS and windows (Baktha, 2017).

1.6.5 Technology Literacy

It is an aptitude of an individual who is working individually or with others. A person sensibly and efficiently using technology to evaluate, handle, incorporate, assess, generate and communicate information is called technologically literate person.

1.6.6 Mobile Technologies

This technology is a mode of cellular communication. It changes with the requirements of the users. Mobile technology is used for two way communication with transportable devices. Mobile technology can sustain education and improve the education delivery (Sheng et al., 2010).

Chapter 2

LITERATURE REVIEW

Literacy has played a fundamental role in human lives. The information literacy has a long history; literacy was first started in 3500 B.C (Schmandt-Besserat, 2011). Due to information literacy human life has been changed. People started understanding why and when they need information, how to be in touch, calculate and use information in a fair way. Literature review is related to previous findings about IL, MIL and students' perceptions about it. Along with that, related research and findings taken by experts are discussed in this chapter and those in writing are also inspected.

2.1 Information Literacy (IL)

The procedure of information literacy helps the learner to transform his evaluated information in a variety of types for private, social and universal purposes. Today's learner is an information seeker, information user, decision maker and problem solver and also called an informationally literate person. IL is the core requirement now-a-days for learners as well as for educators because 21st century is all about using technology in education and integration advance tools and techniques in educational process and for that educators and learners should be informationally literate. To learn IL there are approaches for students, these approaches have a strong relationship with IL. A learning approach covers learners' intentions to understand, learners' focus on the task and learners' way of engagement in learning (Diehm & Lupton, 2012).

Learners lack the capabilities associated with IL and the reason for this is many universities and colleges are not moving to integrate IL to their curriculum at institutional level. Saunders further stated the reason of these capabilities lack that the faculty or staff who has the direct contact with students and who has the responsibility of the curriculum is missing the conversation with the learners (Saunders, 2012).

A research pointed out that most of the higher education students leave education without achieving any IL abilities. Some theories also have evidence those students who receive IL skills and later they forget what they have been taught (Gross & Latham, 2009).

According to most of the researches, information literacy models are split into two main categories, the first category was demonstrated by ACRL (association of college and research libraries) where they described characteristics or traits of a person who is called informationally literate. For an ideal information literate person, the requirements and attributes have been described in this category and they are applied to higher education. If you want to know how informationally literate a learner is, you have to evaluate the learner against their list of standards. The second category was carried out in Australia where IL model was developed “the seven faces”. According to the model people can experience their findings and use information in their own different ways. This model is quite different to the lists of attributes described by the prior model. They look for the representation of the real behavior more willingly than describing the “ideal information literate person” (Walsh, 2012).

Learners of today's generation have many information resources. They have to deal with this huge quantity of information. Although high schools teach the basic information but schools should teach learners how to manage information resources, also they should teach learners about IL. Since the expertise of IL cannot be taught in a comfortable space, students should undergo a problem solving procedure which will necessitate them to define the need for information, establish a strategy for research, locate the resources needed in the process, evaluate and understand the information they find, read that information, interpret the information and then evaluate their conclusion about the original problem (Gikas & Grant, 2013).

2.2 Mobile Information Literacy (MIL)

Reading, writing and having knowledge about a specific area are the characteristics of being literate. With literacy, youth can be educated, get employed, and increase self-respect and empowerment. Literacy plays a vital role to the abilities of a person and helps him contribute in the betterment of society; it improves the future of everyone in the society. Learners who have higher literacy skills can have more opportunities in the field of education and employment and people can put themselves out of poverty. Today's world is progressively more complex and quickly changing in terms of technology so it is important for the learners to constantly enlarge their knowledge areas and learn new skills.

IL is a lifelong learning as it develops the worth of education, IL is helpful in learning environment. MIL is combining the IL with digital and internet world using a Smartphone. It includes new trends within mobile technologies, IL in mobile applications, technologies involved in mobile libraries. MIL is essential for today's learner as it helps the learner to understand the information they get online. Learners

should find ways of getting online information and its evaluation techniques, also the credibility check of the information obtained is necessary and it all comes from mobile information literacy. MIL assists the learner to use, create and publicize the received knowledge in a better way. The information is handed over to mobile devices and to transfer data (information and files) between these mobile devices we may need libraries that will consider how the data is being provided to devices. It is considered easy to bookmark information on a device because it can later be available to a range of other devices (Walsh, 2012).

Mobile technologies have a great impact on information and data transfer but it is going to empower the future of today's learner and their learning behaviors. It is accepted by today's higher education system that mobile information is the reality of the learning environment; it is only dependent on the availability of the internet so mobile technologies have already a great influence on learners as well as on educators (Havelka, 2013).

MIL is basically a combination that binds information literacy, digital world and internet together. According to Clark and Coward (2017), there are quite a few reasons of why do we need MIL:

1. Majority of internet users are online through mobile devices like smart phone so the use of Smartphone is increasing.
2. The previously existing curriculum, structure and training are all about PCs and it is only developed for PCs and computer learners.
3. There are variations in the characteristics of mobile devices and PCs. They have changed size, portability and features of hardware.
4. The lack in ICT skills creates difficulty to accept the internet.

5. Many organizations are working on the mobile literacy training and they are making it a priority.

2.3 Human Perceptions

Perception is mainly an aptitude to become aware of something by seeing or hearing it, the ability of receiving information by seeing or hearing something is perception. Our perception is based on how we interpret or understood some sensations. Humans perceive data through visualization, but we are not sure of how we perceive the information. Most of the studies define perception as a process of distinguish, arrange and understand sensory information. Perception deals with senses of humans that produce signals from the environment by seeing, hearing, touching, smelling and tasting. It is basically a process through which we understand the world around us and for that we make a representation in our mind for our environment (Gellatly, 1999). The process of perception depends on the following factors:

2.3.1 Sensation

Sensation is the ability of an individual to sense stimuli in direct environment.

2.3.2 Selection

Selection is a process in which the individual reduce some stimuli that he sensed and keep others for additional procedure.

2.3.3 Organization

It is the next process in which the selected stimuli are positioned into a structure for storage.

2.3.4 Translation

It is a stage of perceptional process in which we interpret the stimuli and give a meaning to it. Our perceptions are based on our interpretation of different senses we have. Perceptions allows us to map read the world and to make decision about

everything. For example wearing a trouser for going out and running away fast from a dog it all depends on our sensory perceptions.

2.4 Students' Perceptions and Attitudes

Our perception of an event is our individual understanding of information from our personal viewpoint. Likewise, a student's individual perception or attitude about studies tells the impact of school on him. An attitude in commonly conveyed through the words we speak or the behavior we express over something, and perceived by others. Attitude can change all characteristics of an individual's life; a learner's attitude about learning decides his abilities and determination to learn. An understanding of student perceptions can be more helpful in explaining their attitude about studies. According to a study negative attitude and nervousness are directly linked with student's achievements in studies (Ncube & Moroke, 2015).

The students learn by working together energetically and engaging in discussion with other students. It permits learning to appear from combination of perceptions and social experiences. Learning is enlarged ahead of textbooks and learners have to look for other ways of learning to get solution to their educational problems and project tasks as this is 21st century and this the era of technology so there is a rising tendency towards using technology significantly. Conversely, the learning settlement can be accomplished only if the learners understand the technological tools in the learning environment (Seet & Quek, 2010).

To use technological tools in education and to be successful in their field, students must be information literate. Studies shows that all students are not able to know what is information literacy or technology literacy because they come from a

background where these things are not common in high schools so for higher education they have to first clear their perceptions about learning through technology. A study illustrated that many students were unfamiliar with the term information literacy when a research was carried out about their perceptions. All of them tried to start with the concept of "literacy" and linked it with familiar types of literacy and education but it failed later on for them to figure out the definition for information literacy (Gross & Latham, 2009).

2.5 Related Research

To investigate the student perceptions and attitudes about MIL and learning through mobile devices, different studies were conducted in many countries with respect to their nationality, their educational background, their age, gender and educational level.

A study on student's acceptance of ML and their influence about information and communication technology skills (ICTs) was carried out. This study was aimed at ICT literacy impact, awareness about the accessibility and value to the acceptance of ML. A survey questionnaire was done on 196 educators and 413 students and their age was between 20-29 years, they all were undergraduate students in terms of age, gender and background. High level of literacy rate was seen in students who use social media for instance Facebook, Instagram and Whatsapp. Students are buying and selling online products on social media. Teacher had low ended mobile devices as compared to students and they had less experience about advanced features of mobile and were unable in performing tasks with advanced features. ICT anxiety holds back the development of ICT literacy. In students sample 100% had used emails, whereas 99.8% educators used email. 100% students used internet for

searching and 99.5% educators. Cronbach's Alpha value ranged between 0.71 and 0.93 (Callum & Jeffrey, 2013).

A research was carried out and it was about learners' perceptions about using technology for getting educational practices out of the classroom. Researcher was finding out individuality in MLL of the people who use mobile devices. A survey was conducted between 53 students of (17 males and 36 females) graduate classes in Central US University ageing between 21-59 years. The technologies incorporated were Youtube and VoiceThread. The findings collected from the survey showed 84% participants used computers repeatedly in one day, 48% used smart phones, and 28% used other mobile devices outside of classroom. 50/50 students agreed that through these devices they got access to more resources. 52% of learners admitted that these devices have improved their communication with their class fellows and teachers (Kim et al., 2013).

A research was done in Morocco about student perceptions about mobile learning. The study aimed at measuring the interest of students on mobile learning identity, discussion on mobile learning identity, to encourage ML in learners' society and exploration of ML usage in superior level of education in Morocco. Demographic showed that data collection was done by using survey method, quantitative approach and qualitative method. Sample taken was 130 Undergraduate students from a university of Casablanca HASSAN II. From the results, 98.8% students do mobile device, 93% of students always carry mobile devices with them and 45% are using mobile devices for less than 1 year, while 33.7% used mobile equipments for more than two years. Usually, mobile devices are expensive for most of the people. Learners consider ML helpful for education. Majority of students preferred mobile

interaction with their teachers. Quantitative approach has been used for analysis. Most students responded positive about using ML software for improving their academic success. Mostly students were seen using tablets, smart phones and laptops. Majority of the learners were in favor of ML most of the learners used operating systems. Future work was mentioned at the end of the study which focused on ML pedagogy structure (Zidoun, 2016).

Behaviors and perceptions of learners from East Africa about using ML and adopting it in higher education were investigated by Mtebe (2014). Study aimed at investigating those factors which make a contribution towards the acceptance of students and usage of mobile knowledge and to inspect the attitudes of students for accepting and using ML in higher education in East Africa. UTAUT model was used to examine the above mentioned factors. Two version of questionnaire were conducted on a sample of 823 students in higher institute of East Africa. 697 sample responses were received. The other version of the questionnaire was designed at Google Docs tool and a link was distributed to 518 learners. Around 126 responses were received from this questionnaire. Data was collected between April-June 2013. Data analysis was done by SPSS version 20. The findings showed that 76.8% male and 22.2% female students were involved in the survey. 93.4% had internet access via their mobile devices while few students (6.6%) had no access to internet. The percentage of undergraduate students was 80.3 while 15.7% were doing diploma and 3.5% were masters' students. Cronbach's Alpha value for 19 items was 0.913. Results revealed that developing countries consider ML useful in higher education (Mtebe, 2014).

A study was conducted by Ozdamli and Uzunboylu (2015) on the sufficiency and awareness of learner and educators on mobile learning in secondary system of education. This study aimed at comparing capabilities as well as observations of learners and teacher regarding ML. A random sampling method was used for data collection. Data collection was taken from secondary schools (34 schools) in TRNC. Sample was 467 teachers and 1556 students. Teachers were 25% of the target population, return rate from 534 was 467 (88%), 1695 students from all the regions, 1556 responses were received. Five points likert scale was used. SPSS 16 software was used to analyze data. Average age factor was 35 years for teachers and 15 years for students. Gender ratio in teachers: 65.1% were female teachers, 34.9% were male teachers. 58.4% were girls and 41.6% were boys in students. The results showed that educators as well as learners want to integrate ML in education. They had awareness about ML but it was insufficient to use ML applications (Ozdamli & Uzunboylu, 2015).

A study on 288 Konkuk university's Seoul campus students taking e-learning courses was conducted. TAM was used as a hypothetical framework. Cluster sampling method was used. 20 courses were selected randomly corresponding E-leanring. Questionnaires distributed amongst students of different classes. 7 points likert scale was used. Data coded in MS Excel program. LISREL windows version 8.3 was used to test hypothesis. Results showed a positive consideration of model specification. Model represented the data composed in an acceptable way. Positive and negative results were received by TAM constructs about using ML for university learners. The findings were limited to only mobile user learners (Park et al., 2012).

Roohullah Jan et al. (2016) did a study about the perceptions of Pakistani students on ML at university level. This study aimed at better understanding and measuring the perceptions and behaviors of learners towards the usefulness of ML at University level. The other factors of the research were determining the access of mobile devices between Pakistani students, battery timing of the devices and concluding awareness level of learners about ML.

Around 1500 male and female students participated in survey questionnaire from different faculties of AWKUM. Quantitative method was used for sampling. Results showed that 327 male and 238 female students were having mobile with no access of internet. Majority of students showed positive attitude towards ML and they revealed that it will help them in learning procedure because of the availability of mobile devices everywhere and also carrying them anywhere in easy. So an overall result was students preferred mobile technology over e-learning in AWKUM university (Roohullah Jan et al., 2016).

According to the literature review most of past results have focused on determining educators and students' attitudes and perceptions about ML, usefulness of ML, effectiveness of ML, ICT literacy, Impact of ICT literacy, use of mobile devices and impact of ICT skills taking into consideration the factors like gender, age, level of study, approach to new technology, background and geological locations. The results found that there are positive perceptions in students as compared to educators about ML. literature review has also shown that most of the students know the basic level of mobile learning and no positive response about the advance level of mobile learning was found. Students are more aware of ICT literacy and technology than that of educators but both the students and educators want to use m-learning in

education. Also the past studies are in particular geographical domains (different countries). So this study is particularly for the undergraduate IT students in Pakistan. Therefore, understanding that what does an information literate person seems like and by integrating mobile information technology in education what is the criteria for an information literate university is lacking in previous results. So the current research seeks to fill the literature gap and propose the following objectives to find out through the study:

1. Looking for students' perceptions about informationally literate university.
2. Looking for students' perceptions about an informationally literate person.
3. Looking for the framework of information literacy.
4. ICT and students.

Chapter 3

METHODOLY

This chapter of the study is about carrying out the research, sampling techniques used for data collection and research method used. Chapter 3 also demonstrates the participants, the tools used for data collection, data analysis methods and validity and reliability implemented to answer the research questions.

3.1 Research Methods

The approach used for this study is quantitative research method and the tool used is survey questionnaire on for measuring the scale of Attitudes and Perceptions of Undergraduate IT Students bout MIL. Quantitative research method highlights the analysis of statistical or mathematical data collected during the survey, it also highlights the statistics. Quantitative research is a deductive approach towards research and researchers consider the world as being an external in it. In quantitative approach, the gathering and examination of information is carried out using scientifically based methods focusing upon questionnaires or surveys, it also focuses on assembling statistical data and simplifying it within groups of individuals (Almalki, 2016).

Quantitative method focuses on calculations of the data. The aim is to construct precise and consistent measurements for numerical analysis. It helps researchers to find out more about the demographics of a population, inspect attitudes and behaviors, file styles or clarify what is recognized. Measurements like fractions,

percentages, frequencies and relationships give meaning to calculate and provide verification for the variables listed (Goertzen, 2017).

A descriptive characteristic of a survey technique is used in the questionnaire for assessing the behavior and perceptions of undergraduate IT students in Pakistan and results were collected from the sample of the participants. Descriptive research is the most basic type of research where the researcher aims to collect information on particular phenomena; it is a way of gathering data from people with same benefits. Situation is inspected by illustrating important factors related with the situation such as demographics, health characteristics, events, perceptions, behaviors, attitudes, information and practices (Kelley et al., 2003).

3.2 Sampling Technique

The researcher examined the perceptions and behaviors of undergraduate IT students from CUI Pakistan. The convenience sampling method was used so 500 students from the department of IT have contributed in the study. The researcher took the consent from the participants first which made it clear that the given data will be used for study purpose only and it is anonymous.

Convenience sampling also known as the researching subjects of the population that are accessible to the research easily. This sampling method is reasonable, trouble-free and the subjects are voluntarily available. It is necessary for the researcher to explain how the sample would be different from the one that was at random selection. Researchers use convenience sampling for gathering data from easily accessible participants (Etikan, 2016).

3.3 Participants

Survey was distributed to 800 undergraduate IT students from CUI Pakistan and a population of 500 students has participated in questionnaire which includes 1st, 2nd, 3rd and 4th year students. Data collection was done during 8th June 2020 to 20th July 2020. Figure 3.1, 3.2, 3.3 and 3.4 showing the gender, age range, year of study and teaching method respectively.

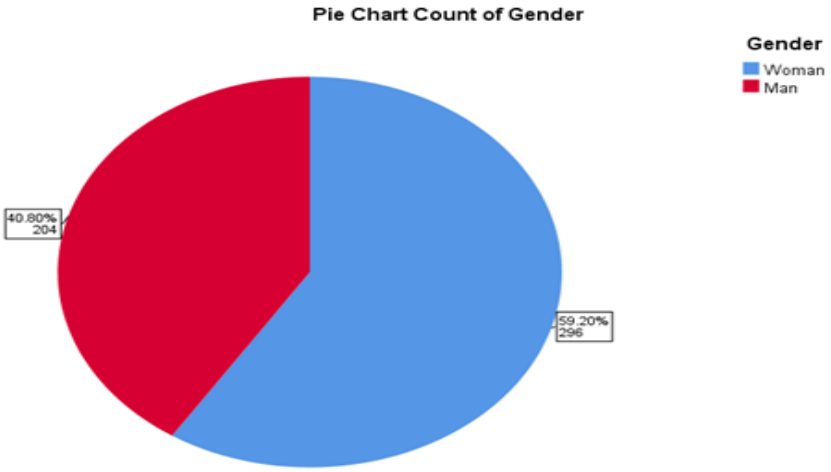

Figure 3.1: Gender of Participants

As demonstrated in the figure 3.1, 500 students participated in the survey out of that 59.2% were female (296 students) and 40.8% were male (204 students).

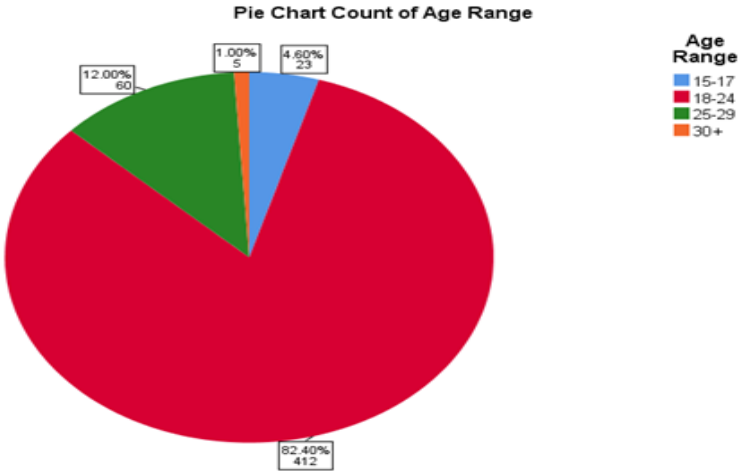

Figure 3.2: Age Range of Participants

Figure 3.2 concluded that 4.6% (23 students) were from the age range of 15-17, 82.4% (412 students) were between 18-24 age ranges, 12% (60 students) were in 25-29 years age range and 1% (5 students) was 30+ age range. According to the results, 100% participants were from Pakistan (500 students).

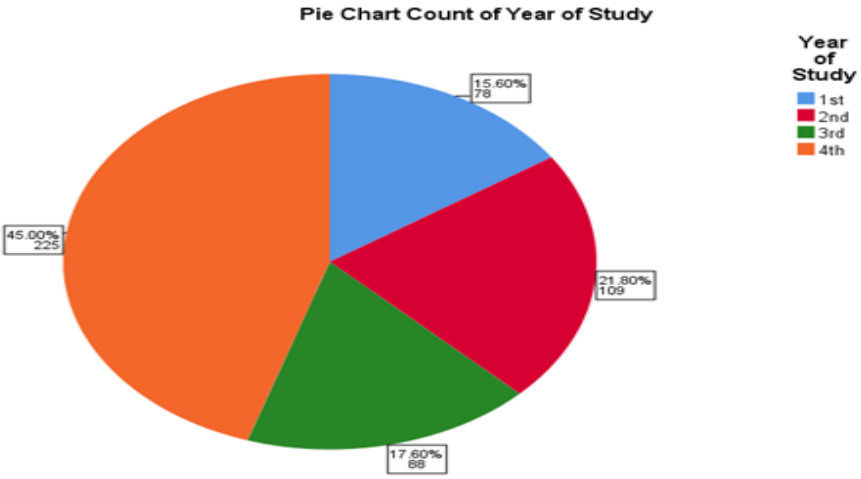

Figure 3.3: Year of Study of Participants

In figure 3.3, the year of study levels of Pakistani students were shown which says that 15.6% (78 students) were in 1st year of bachelors, 21.8% (109 students) were in 2nd year, 17.6% (88 students) were in third year and 45% (225 students) were from 4th year of bachelors.

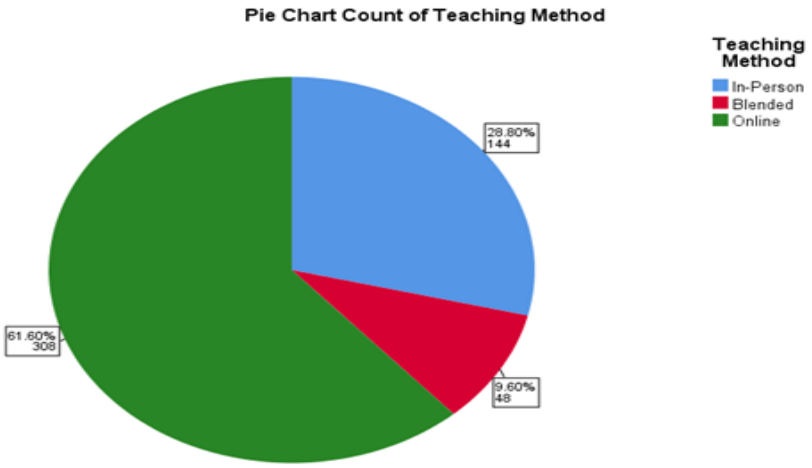

Figure 3.4: Teaching Method Preferred by Participants

Figure 3.4 showed different types of teaching methods preferred by number of students. 28.8% (144 students) said they would choose face to face education (in-person teaching method), while 9.6% (48 students) chose blended teaching method and 61.6% (308 students) preferred online teaching method.

3.4 Data Collection Tools

The used survey had two parts, one was the demographic section and 2nd was MIL scale. The researcher developed the demographic part by herself including five general questions about students' age, gender, nationality, year of study and preferred teaching method.

3.4.1 Questionnaire

In the second section, Mobile Information Literacy scale questions are adopted from a questionnaire by Pinto et al. (2020) that is based on 5 point likert scale with minimum value of 1 and maximum value of 5. It was consisted on 23 items that contained affirmative questions while there were no reverse type questions to measure. The scale was designed by the researcher using Google forms and was distributed to the participants by using link via e-mail, Whatsapp and Facebook.

3.4.2 Google Forms

The questionnaire was designed to assess the attitudes and perception level of the learners about MIL under four subdivisions which were as follows: Informationally Literate University, Informationally Literate Person, Framework of IL and ICT and Students. The informationally Literate University consisted of 5 items, these items aimed at determining that how do students perceive an informational literate university. The sub-division Informationally Literate Person had 6 items and they focused on students' way of perceiving an informationally literate person. The next subdivision was about students perceptions about the Framework of IL and it was

consisted of 6 items. The last subdivision had 6 items and it was about ICT and Students' perceptions. This questionnaire was selected because the items were capable of discriminating the participants by the scale for determining features.

3.5 Data Analysis

Data was analyzed by SPSS statistics 25.0 software and descriptive analysis techniques were used. The reason why SPSS was used is because it is a powerful tool for manipulating and analyzing the survey data. Furthermore, One-way Anova, Frequency (f), Percentage (%), Post hoc and Independent T-test were used for data analysis.

Descriptive analysis and frequency was applied to the data to get unimportant results. T-test was used to analyze two factors such as gender and one-way ANOVA was used for analysis of more than two factors such as age ranges and year of study.

3.6 Reliability and Validity

The base study done by Pinto et al. in early 2020 had Cronbach's Alpha value of 0.851 which proved higher reliability of MIL scale and items of the scale were constant (Pinto et al., 2020).

Conversely, for this research, the general Cronbach's Alpha value for 23 items was conducted and the results received were 0.97 which is a high value and is nearly 1 so it is proved that the MIL scale is consistent. A high value of Cronbach's Alpha points out that the conditions needed for building validity were satisfied (Kelley et al., 2003).

Chapter 4

RESEARCH FINDINGS

Chapter 4 shows the results received from the data analyzed. The below details present the perceptions of participants about MIL according to their gender, age, nationality, year of study and teaching method.

4.1 Perceptions of Undergraduate IT Students About Informationally Literate University

Table 4.1 shows the SD and Mean of the students' perception about MIL based on 4 sub-divisions together.

Table 4.1: Mobile Information Literacy Level of Pakistani Undergraduate IT Students

Sub-Dimensions	N	Mean	SD
Informationally Literate University	500	14.76	5.07
Informationally Literate Person	500	19.30	6.78
Framework of Information Literacy	500	18.62	6.46
ICT and Students	500	18.47	6.42

As it can be seen in 4.1 Table that the four sub-dimensions Informationally Literate University, Informationally literate Person, Framework of IL and ICT and Students sub-dimensions have 5, 6, 6 and 6 items respectively. These items are calculated on 5 point Likert scale ranging from 1 to 5 with minimum and maximum values respectively.

According the table 4.1, the average mean value for each sub-dimension is 14.76, 19.30, 18.62 and 18.47 for Informationally Literate University, Informationally Literate Person, Framework of IL and ICTs and Students respectively. The mean value is an important measurement, a mean value that is noticeably higher that the average mean midpoint value specifies the high mean value but a significantly larger mean value from average midpoint of mean and with a close range of maximum mean value is correspondingly very high (Timbó, 2017).

In addition, the mean value of students' perceptions about Informationally Literate University was 14.76 and SD value is 5.07 as shown in table 4.1. In observation to MIL, the respected sub-dimension illustrates the positive perception level of undergraduate IT students about Informationally Literate University has five items.

Table 4.2: Perceptions of Learners About ILU is the Future of Higher Education

		Frequency	Percent	Mean	SD
Item 1	Strongly disagree	73	14.6	3.03	1.23
	Disagree	96	19.2		
	DK/NO	126	25.2		
	Agree	151	30.2		
	Strongly agree	54	10.8		
	Total	500	100.0		

In accordance with Table 4.2 almost half of the students perceived positively about Informationally Literate University being future for the higher education, as a result 41% (205 students) showed high level of perception about an Informationally Literate University that it is the future for university level students. While, 33.8% (169 students) were against the idea of making informational literate universities as a

future of higher education, while 25.2% (126 students) had no opinion about a university integrating IT in education.

As a result, on a 5 point Likert scale where the items were validated on, an estimated mean was 3.03 and standard deviation was estimated at 1.23 which indicates that each student showed a different level of perception about MIL but majority was agreed on this idea. This shows that if undergraduate IT students in Pakistan are studying in informational literate university they will have positive perceptions about it being the future of higher education.

The results were quite similar with Stanojevic and Rakic (2019) who indicate that majority of students have knowledge about learning in an environment where they have equipments like information technology and they prefer using technology and information for their higher education in future.

Table 4.3: Students' Perceptions About ILU and Reflective Thinking Skills

		Frequency	Percent	Mean	SD
Item 2	Strongly disagree	68	13.6	3.01	1.20
	Disagree	112	22.4		
	DK/NO	110	22.0		
	Agree	167	33.4		
	Strongly agree	43	8.6		
	Total	500	100.0		

According to Table 4.3 mostly students feel that their reflective thinking skills can be promoted if they are studying in an institute well equipped with technology, as a result 42% (210 students) showed positivity in perceptions about informationally literate university that it enhances critical thinking in students and it should be promoted. On the other hand, 36% (180 students) were not in favor of the idea, while

22% (110 students) have no idea about informationally literate university promoting critical and reflective thinking.

As a result, on a 5 point Likert scale where the items were validated on, an estimated mean was 3.01 and standard deviation was estimated at 1.20 which indicates that majority was agreed on the positive perceptions. This shows that undergraduate IT students in Pakistan have much awareness about technology being used at university level and integration of ICT in education.

He et al. (2017) has also showed majority of students have positive perception about information literacy and mobile technologies and they revealed that their critical thinking level is associated with information technology tools and literacy level.

Table 4.4: Students' Perceptions About ILU Fostering Lifelong Learning

		Frequency	Percent	Mean	SD
Item 3	Strongly Disagree	69	13.8	2.90	1.15
	Disagree	118	23.6		
	DK/NO	140	28.0		
	Agree	139	27.8		
	Strongly Agree	34	6.8		
	Total	500	100.0		

As per Table 4.4 34.6% (173 students) showed high level of optimistic towards the perceptions about Informationally Literate University promotes lifelong learning. Where, 37.4% (187 students) didn't like the idea of promoting lifelong learning with IT. On the other hand, 28% (140 students) were unaware about how to perceive about fostering lifelong learning if IT in integrated in education.

The estimated mean of 2.90 with SD of 1.15 was determined and it shows that students are aware of how to being literate about technology and how to integrate it educationally. Instruction et al. (2015) has also indicated that ML and technologies are the ways for a lifelong learning of learner.

Table 4.5: Students' Perceptions About Making the Teaching-Learning Process Easier With ILU

		Frequency	Percent	Mean	Std. Deviation
Item 4	Strongly Disagree	83	16.6	2.95	1.29
	Disagree	122	24.4		
	DK/NO	97	19.4		
	Agree	135	27.0		
	Strongly Agree	63	12.6		
	Total	500	100.0		

It can be seen in table 4.5 that 39.6% (198 students) perceived that teaching-learning process can be easier if they are studying in an informationally literate university. Yet, in spite of positive perceptions of these learners towards advanced learning environment, a larger level of respondents 41% (205 students) disagreed with the idea that they should have informationally literate university to make teaching-learning process easier. 19.4% (97 students) showed no opinion about the idea.

Additionally, a mean of 2.95 with SD of 1.29 was received which revealed that students don't feel positive about having a university informationally and technologically equipped for their learning process. It can be concluded that having an informationally literate university will not affect the teaching and learning process.

Decisively, a study on students perceptions about technological learning environments has different result from the results of this survey where they found in their finding that students have positive perceptions about making learning and education easy with the advancement in their education environment and having more technology and information literacy involved (Montrieux et al., 2015).

Table 4.6: Students' Perceptions About ILU Assuming Ubiquitous or Blended Nature Teaching

		Frequency	Percent	Mean	SD
Item 5	Strongly disagee	82	16.4	2.87	1.16
	Disagree	96	19.2		
	DK/NO	160	32.0		
	Agree	129	25.8		
	Strongly agree	33	6.6		
	Total	500	100.0		

As it can be seen in Table 4.6, 32.4% (162 students) portrayed a slightly high level of perceptions from participants thinking teaching is a blended nature. In resistance to this, 35.6% of 178 students were not in favor of the idea, expressing that they do not feel that informationally literate university can make teaching a blended nature, and 32% students (160 of them) were unbiased about their perceptions on the idea.

Moreover, 2.87 mean value and 1.16 SD value exemplified in an informationally literate university, there is no need to integrate blended nature of teaching method.

Similarly, same results were achieved in the findings of Serdyukov (2017) where he indicated that there's a need to focus on integrating the technology teaching method to produce quality learning for students.

However, it should be noted that IT students need to be familiar with the blended nature of learning; promoting lifelong learning and they should be informed about how they can make learning process easy with studying in an informationally literate university.

4.2 Perceptions of Undergraduate IT Students About Informationally Literate Person

According to the Table 4.1 shown in above section, informationally literate person has 6 items consisting of 5 point likert scale from 1 as minimum value and 5 as maximum.

In addition, the mean value of students' perceptions about informationally literate person was 19.30 and SD as 6.78 as shown in table 4.1. When compared to the other three sub-dimensions, the informationally literate person sub-division had a significantly high mean and SD values.

In examination to mobile information literacy, the valued sub-division demonstrates the constructive perception level of undergraduate IT students about informationally literate person based on 6 items.

Table 4.7: Students' Perceptions About ILP Identifying Their Information Needs

		Frequency	Percent	Mean	Std. Deviation
Item 6	Strongly Disagree	70	14.0	3.20	1.23
	Disagree	77	15.4		
	DK/NO	90	18.0		
	Agree	209	41.8		
	Strongly Agree	54	10.8		
	Total	500	100.0		

From Table 4.7, it was concluded that 52.6% (263 students) portray high level of authentication on identifying their information needs by being an informationally literate person. Yet 29.4% (147 students) believed they don't need to be an informationally literate person for identifying their needs for information, while 18% (90 students) said they do not know.

A total average of mean 3.20 and SD 1.23 was obtained which demonstrates that when learners want to identify their needs for information then they become informationally literate people and also a majority of students' perceptions are positive about being engaged with technology and informationally literate because they think they can get better identification of their information needs by this.

The same results found out by Schindler et al. (2017) who specified that students get better in identifying their information needs if they are influenced by technology and mobile devices.

Table 4.8: Students' Perceptions Relative and Quality Sources for Getting Information

		Frequency	Percent	Mean	SD
Item 7	Strongly disagree	72	14.4	3.30	1.29
	Disagree	66	13.2		
	DK/NO	84	16.8		
	Agree	194	38.8		
	Strongly agree	84	16.8		
	Total	500	100.0		

In reference to Table 4.8, majority of the students show positive perceptions about understanding and using quality information sources. As a result, 55.6% (278 students) strongly state that they have firm believe on an informationally literate

person understanding better sources for quality. In opposition to this thought, 27.6% (138 students) were not in favor of understanding relevant sources for quality information, while 16.8% (84 students) were unaware of the fact.

Convincingly, 3.30 mean value with SD value of 1.29 was gained which tells that when students are informationally literate, they understand more related information sources and they use quality sources in a better way. So, undergraduate IT students reveal higher perceptions for information sources for having related data and they use it properly.

Likewise, the results received from this study is somehow equivalent with the findings of Shrestha (2008) where it was concluded that students use relevant and quality sources for their needs to a great extent.

Table 4.9: Students' Perceptions About ILP Using Varied Information Resources Efficiently and Effectively

		Frequency	Percent	Mean	SD
Item 8	Strongly Disagree	78	15.6	3.32	1.35
	Disagree	62	12.4		
	DK/NO	87	17.4		
	Agree	168	33.6		
	Strongly Agree	105	21.0		
	Total	500	100.0		

Table 4.9 shows that most of the learners think if they are informationally literate then they can use information resources efficiently and effectively. As a result, 54.6% (273 students) strongly assert that they have firm believe on an informationally literate person understanding better sources for quality. In opposition

to this thought, 28% (140 students) were not in favor of understanding relevant sources for quality information, while 17.4% (87 students) were unaware of the fact.

In addition, mean value of 3.32 and SD of 1.35 were calculated, it shows that respondents are informationally literate and they know how to use information resources successfully and professionally.

Furthermore, the findings of a study about "effective learning through mobile" are the evidence that students use information sources for study purposes and this indicated that majority of students use physical libraries as a part of their educational institute and they use diverse information resources for their educational purposes (Roohullah Jan et al., 2016).

Table 4.10: Students' Perceptions About Evaluating Information Sources in a Critical Manner

		Frequency	Percent	Mean	SD
Item 9	Strongly Disagree	65	13.0	3.24	1.26
	Disagree	79	15.8		
	DK/NO	109	21.8		
	Agree	166	33.2		
	Strongly Agree	81	16.2		
	Total	500	100.0		

According to the Table 4.10, 49.4% (247 students) agreed on evaluating resources in a critical manner by being an informationally literate person, while 28.8% (144 students) disagreed with not being an informationally literate person for evaluating information sources critically. Whereas 21.8 (109 students) gave no opinion over it. A mean value of 3.24 and an SD value of 1.26 were obtained. However, in the related research conducted by Parsazadeh (2015) gave different results about

students perceptions, it was illustrated by the study results that mostly students lack in evaluating information in critical manner and they were unable to compare information with various sources.

Table 4.11: Students' Perceptions About Proper Citation of the Information Sources Used

		Frequency	Percent	Mean	SD
Item 10	Strongly Disagree	71	14.2	3.12	1.24
	Disagree	90	18.0		
	DK/NO	100	20.0		
	Agree	184	36.8		
	Strongly Agree	55	11.0		
	Total	500	100.0		

In Table 4.11, mostly students think that proper citation of information sources is easy for an informationally literate person. 47.8% of the respondents (239 students) demonstrated high levels of optimism towards being informationally literate for using proper citation of information sources. Though, the levels of optimism were high, 32.2% (161 respondents) had conflicting viewpoint towards this idea, while 20% (100 students) were unbiased when it came to use proper citation of information sources being informationally literate.

Finally, mean value of 3.12 with SD of 1.24 was achieved which shows that respondents showed positive perceptions about being informationally literate and using proper citations of information resources.

A study indicated the findings of students having access to information sources but it is being challenged when they try to properly cite and use these sources so students need to be educated about this (Farley et al., 2015).

Table 4.12: Students' Perceptions About Disseminating Information in a Rigorous and Appropriate Manner

		Frequency	Percent	Mean	SD
Item 11	Strongly Disagree	80	16.0	3.12	1.23
	Disagree	68	13.6		
	DK/NO	111	22.2		
	Agree	193	38.6		
	Strongly Agree	48	9.6		
	Total	500	100.0		

As illustrated in Table 4.12, the level of students' perceptions about publishing information in a precise and appropriate way is high. 48.2% (241 students) are in favor of using information literacy for disseminating information precisely. However, in spite of the high levels of optimism displayed by users towards being informationally literate, 29.6% (148 students) were still against the idea of being informationally literate. On the other hand, 22.2% (111 students) said they do not know about the idea. A mean value of 3.12 and SD value of 1.23 was obtained from the results and it points towards the high awareness level of students about MIL. A research on a similar topic was done and indicated that more than 80% of the respondents showed that they can use and disseminate information effectively, efficiently and appropriately (Rehman, 2017).

According to the results gained about an informationally literate person sub-dimension, it was seen from the results that IT students showed positivity towards the awareness of MIL. Though, instead of the positive results received from this sub-dimension, students' level of citing information sources by being an informationally literate individual; they need to be educated more over it about how they can be citing proper information sources.

4.3 Perceptions of Undergraduate IT Students About Framework of Information Literacy

According to the Table 4.1 shown in above section, framework of information literacy consisted of six items calculate on 5 point likert scale with value 1-5 being maximum to minimum respectively.

In addition, the mean value of students' perceptions about information literacy is 18.62 and SD as 6.46 as shown in table 4.1. In inspection to MIL, the discussed sub-division had the positive perception level of undergraduate IT students about information literacy based on 6 items.

Table 4.13: Students' Perceptions About Authority being Constructed and Contextual

		Frequency	Percent	Mean	SD
Item 12	Strongly Disagree	62	12.4	2.91	1.07
	Disagree	104	20.8		
	DK/NO	176	35.2		
	Agree	135	27.0		
	Strongly agree	23	4.6		
	Total	500	100.0		

According to the Table 4.13, majority of the students were not sure about how authority is constructed and relative. As a result, 31.6% (158 students) strongly perceived authority as contextual and constructed but opposite to this thought, 33.2% (166 students) were not in favor of authority being relative, while majority of students 35.2% (176 students) were unaware of it. Apparently, a mean value of 2.91 and SD value of 1.07 was obtained from the results and it shows that most of the respondents are not sure about idea of authority being used in educational system.

A study about students and mobile devices has same findings and according to his results learners believe that authority of the data depends on the controller's awareness level (Traxler, 2016).

Table 4.14: Students' Perceptions on Information Creation

		Frequency	Percent	Mean	SD
Item 13	Strongly disagree	75	15.0	3.14	1.25
	Disagree	84	16.8		
	DK/NO	87	17.4		
	Agree	202	40.4		
	Strongly agree	52	10.4		
	Total	500	100.0		

According to Table 4.14, more than half of the population expressed high levels of optimism towards the process of information creation. As a result, 50.8% of the respondents (254 students) were perceiving information creation as a process. Regardless of the high levels expressed by greater part of respondents, 31.8% (159 students) disagreed with the idea, even as 17.4% (87 students) showed no opinion about the process.

Apparently, a mean value of 3.14 and SD value of 1.25 was obtained from the results which is significantly high and also shows that students are optimistic about the information process.

Table 4.15: Students' Perceptions About Information's Value

		Frequency	Percent	Mean	SD
Item 14	Strongly disagree	77	15.4	3.28	1.37
	Disagree	81	16.2		
	DK/NO	78	15.6		
	Agree	155	31.0		
	Strongly agree	109	21.8		
	Total	500	100.0		

According to table 4.15 most of respondents think that information has value. As a result of this, 52.8% of the respondents (264 students) feel highly optimistic about the value of information. Moreover, 31.6% (158 students) thought that information has no value and 15.6% (78 students) remained impartial. So, a mean value of 3.28 and SD value of 1.37 was obtained from the results. It shows that majority of respondents were highly optimistic about the idea.

Convincingly, a similar research on the perspectives of IL in academics revealed quite different results from the finding of this study where it was concluded that students lack awareness about the value of information, they lacked in IL skills and also they did not receive any guidance from their teachers (Yevelson-shorsher & Bronstein, 2018).

Table 4.16: Students' Perceptions About Research as a Process of Questioning

		Frequency	Percent	Mean	SD
Item 15	Strongly Disagree	90	18.0	3.14	1.36
	Disagree	80	16.0		
	DK/NO	87	17.4		
	Agree	156	31.2		
	Strongly Agree	87	17.4		
	Total	500	100.0		

According to Table 4.16, 48.6% (243 students) illustrated high levels of indication on research being a process of questioning, while 34% (170 students) were in disagreement about the idea, while 17.4% (156 students) remained neutral. Besides, a mean of 3.14 with SD of 1.36 was obtained from the results. It shows that majority of respondents were highly optimistic about the idea.

The same finding was indicated by the research about perceptions and challenges of mobile learning where researchers found out that students have positive suggestions and opinions about research is a process of questioning (Al-hunaiyyan et al., 2018).

Table 4.17: Students' Perceptions on Learning as a Dialogue

		Frequency	Percent	Mean	SD
Item 16	Strongly disagree	67	13.4	2.93	1.16
	Disagree	117	23.4		
	DK/NO	140	28.0		
	Agree	137	27.4		
	Strongly agree	39	7.8		
	Total	500	100.0		

In accordance with the data of Table 4.17, 35.2% (176 students) had the positive opinion about learning is a dialogue, on opposing 36.8% (184 students) believed that learning cannot be a dialogue, while 28% (140 students) were unfamiliar with the fact of learning being a dialogue.

Mean of 2.93 with SD of 1.16 was obtained that showed that majority of learners do not know about dialogue and learning relationship. On the other hand, a study has indicated opposite result that students believe on learning being a dialogue (Al-hunaiyyan et al., 2018).

Table 4.18: Students' Perceptions On Searching For Information Requiring a Strategy

		frequency	Percent	Mean	SD
Item 17	Strongly disagree	76	15.2	3.23	1.34
	Disagree	78	15.6		
	DK/NO	96	19.2		
	Agree	153	30.6		
	Strongly agree	97	19.4		
	Total	500	100.0		

According to the table 4.18, half of the students demonstrated that the search for information requires a strategy. As a result, 50% (250 students) strongly declared that they have firm believe on the strategic approach of information for searching. In resistance to this thought, 30.8% (154 students) were not in favor of the idea, while 19.2% (96 students) were unaware of the fact.

Consequently, the mean result achieved was 3.23 with a SD of 1.34 which means that mostly students have perceived that search of information needs a strategy.

The findings of this sub-dimension, it was concluded that undergraduate IT students express high levels of perceptions towards the Framework of Information Literacy. Nevertheless, even with the high results obtained in this sub-dimension, there's a need to educate students about the authority that either it is constructed or not. Even though respondents are well aware of the idea, but some of them feel like learning is not a dialogue so they need to be familiarized with that too.

4.4 Perceptions of Undergraduate IT Students About ICT and Students

As the Table 4.1 showed in above section, ICT and students has six item that calculated on a 5 point likert scale of minimum to maximum values of 1 to 5 respectively. Furthermore, the mean value of students' perceptions about ICT and students was 18.47 and SD as 6.42 as shown in table 4.1. Demonstrating Information and Communication Technologies (ICT), the given sub-division reveals the positivity in perception level of undergraduate IT students about ICT and students based on 6 items.

Table 4.19: Students' Perceptions About Searching Information on Mobile Devices

		Frequency	Percent	Mean	SD
Item 18	Strongly disagree	92	18.4	3.33	1.45
	Disagree	63	12.6		
	DK/NO	66	13.2		
	Agree	147	29.4		
	Strongly agree	132	26.4		
	Total	500	100.0		

According to the Table 4.19, majority of the students told that they search information using mobile phone devices. As a result, 55.8% (279 students) strongly stated that they are completely dependent on mobile devices and technology when it comes to search information. In opposition to this idea, 31% (155 students) were still not in favor of using mobile devices for searching information, while 13.2% (66 students) preferred not to give any thought. A mean value of 3.33 and SD value of 1.45 was obtained from the results. It can be concluded that undergraduate IT students make it obvious that they need mobile devices for searching information.

Ahmad (2020) has explained in his research findings that students are very fond of mobile devices and they showed an overall positive perception for using mobile phones.

Table 4.20: Students' Perceptions on Accessing All the Needed Information Using ICTs And Mobile Devices

		Frequency	Percent	Mean	SD
Item 19	Strongly disagree	68	13.6	3.09	1.27
	Disagree	114	22.8		
	DK/NO	95	19.0		
	Agree	153	30.6		
	Strongly agree	70	14.0		
	Total	500	100.0		

As illustrated in Table 4.20, a significant amount of students expressed positive perceptions about using ICTs and mobile devices to access all the information they need. In addition, 44.6% of respondents (223 students) showed high levels of agreement on using mobile devices and ICT for accessing the information and data needed. On the other hand, 36.4% of respondents (182 students) were not in support of this idea and they said they do not access their needed information through the devices, at the same time 19% of respondents (95 students) gave no opinion.

Conclusively, mean of 3.09 and SD value of 1.27 have indicated that students depend on the mobile devices and ICT. It can be wrapped up that undergraduate IT students demonstrate high level of perceptions about using ICT and mobile devices when they need any information to access. It is fairly obvious through the study by Ahmad (2020) where he also explained in his research that most of the students depends on ICTs and mobile devices to access all the information they need.

Table 4.21: Students' Perceptions on Improving Critical Thinking Skills

		Frequency	Percent	Mean	SD
Item 20	Strongly disagree	75	15.0	3.12	1.31
	Disagree	101	20.2		
	DK/NO	86	17.2		
	Agree	163	32.6		
	Strongly agree	75	15.0		
	Total	500	100.0		

According to the Table 4.21, most of the students showed positive response about thinking critically with instant access of information. As a result, 47.6% (238 students) strongly believed about thinking critically having instant access to information while 35.2% (176 students) were not in favor of thinking critically by having instant access to data and information, while 17.2% (86 students) didn't know

anything about this. A mean value of 3.12 with the SD of 1.31 which supports the above statement that students believe on thinking critically if they have instant access to information which can only be possible with ICT and mobile devices. Metzger et al. (2003) has illustrated in his study findings that students prefer to have instant access to information they want it to be more trustworthy so that they can think critically and they rely heavily on mobile devices and web.

Table 4.22: Students' Opinion About Lowering the Importance of Citing Sources.

		Frequency	Percent	Mean	Std. Deviation
Item 21	Strongly Disagree	71	14.2	2.95	1.17
	Disagree	107	21.4		
	DK/NO	134	26.8		
	Agree	150	30.0		
	Strongly Agree	38	7.6		
	Total	500	100.0		

As per Table 4.22, 37.6% (188 students) agreed on the usage of ICTs and mobile gadgets have lowered citing sources importance, but 35.6% (178 students) disagreed to that, While 26.8% (134 students) had no idea. A mean score of 2.95 and SD value of 1.17 showed that students are more aware of using and citing sources through internet and mobile devices.

Cheon et al. (2012) researched on ML readiness at university level where it was concluded that students have accepted ICTs and mobile devices usage very well and it somehow lowered the importance of other sources because mobile devices adaptation has influenced them greatly.

Table 4.23: Students' Perceptions About Mobile Devices Contributing Towards Distraction in Class

		Frequency	Percent	Mean	Std. Deviation
Item 22	Strongly Disagree	84	16.8	2.92	1.26
	Disagree	111	22.2		
	DK/NO	123	24.6		
	Agree	126	25.2		
	Strongly agree	56	11.2		
	Total	500	100.0		

As shown in table 4.23, a lot of respondents said that mobile devices have distracted them in classrooms. 36.4% of respondents (182 students) revealed that they get distracted in their studies due to mobile devices as now mobile devices have a significant impact on their lives. However, 39% of respondents (195 students) were against the idea of being distracted by having mobile devices while studying, on the other hand 24.6% of the respondents (123 students) said they are not sure about the idea. Mean value of 2.92 and SD value of 1.26 was obtained from the results. It shows that majority of respondents were against the idea.

Opposing to this finding, a research on the distraction made by digital devices in classrooms was done and it illustrated that 89% of respondents were greatly distracted by the use of mobile devices while studying (McCoy, 2016).

Table 4.24: Students' Perceptions on Taking Notes for Information on Mobile Devices

		Frequency	Percent	Mean	SD
Item 23	Strongly disagree	91	18.2	3.07	1.33
	Disagree	89	17.8		
	DK/NO	84	16.8		
	Agree	167	33.4		
	Strongly Agree	69	13.8		
	Total	500	100.0		

According to the Table 4.24, 47.2% (236 students) strongly agreed that they take notes for information on mobile devices. On the other hand, 36% (180 students) were not in favor of taking notes on mobile devices for noting information, while 16.8% (84 students) had neutral responses. Consequently, the mean of 3.07 was received with an SD value of 1.33. It says that mostly learners use mobile devices for taking notes about the information.

A study on students perceptions about ML has also revealed in findings that mostly students use mobile devices for taking notes as they are greatly dependent on mobile devices usage (Ahmad, 2020).

According to the results received from the data of ICT and students sub-dimension, it can be said that from the findings that undergraduate IT students in Pakistan demonstrate high levels of positivity towards using ICTs and mobile devices for education purposes.

However although the students showed a high level of understanding towards using ICTs and mobile devices for information they still need to be educated that excessive use of mobile devices can distract them from their studies.

4.5 Relationship Between Mobile Information Literacy and Gender of Undergraduate IT Students

So as to decide if the perception of mobile information literacy in Undergraduate IT students in Pakistan differs predictably amongst genders, independent T-test was conducted to evaluate MIL perceptions in female and male genders.

The results of the independent t-test showed that out of 23 items, only 7 items had a significant difference regarding the gender of undergraduate IT students of Pakistan because their significance level is less than 0.05.

Table 4.25 shows the expressive data results of descriptive statistics and independent t-test having n, mean value and SD from statistics analysis and significance, t, df and sig (2-tailed) from independent t-test of item 1, item 2, item 3, item 5, item 10, item 12 and item 13.

Table 4.25: MIL Perceptions and Gender of Pakistani Students

Items	Gender	N	Mean	Std. deviation	Sig.	T	Df	Sig. (2-tailed)
Item 1	Woman Man	296 204	3.19 2.81	1.18 1.25	.200	3.360	498	.001
Item 2	Woman Man	296 204	3.12 2.85	1.20 1.19	.955	2.434	498	.015
Item 3	Woman Man	296 204	3.05 2.69	1.16 1.10	.589	3.429	498	.001
Item 5	Woman Man	296 204	3.00 2.68	1.15 1.16	.142	3.032	498	.003
Item 10	Woman Man	296 204	3.22 2.98	1.22 1.25	.865	2.153	498	.032
Item 12	Woman Man	296 204	3.01 2.75	1.05 1.07	.154	2.629	498	.009
Item 13	Woman Man	296 204	3.24 3.01	1.25 1.24	.730	1.994	498	.047

According to the significance value, it can be seen that female students have high mean value for all 7 items as compared to male. It can be concluded from the results that female have more awareness about MIL and they showed higher perceptions level in using mobile devices for educational purposes than male students.

However, this result can be generalized as a whole finding since the number of female participants in study is more than that of male participants. Additionally, out of all 23 items, 16 items had no significant difference among the gender but 7 items had a significant difference. Results point out an importance difference between gender and MIL perceptions of students. Likewise, the findings propose that gender is an important determinant for MIL of undergraduate IT students in Pakistan.

Consequently, there is a relationship between MIL and gender of IT students, as a result proving that female undergraduate IT students are more ready for using mobile technologies and devices in their learning process. They have better understanding of mobile technologies and more experience of ICTs and mobile devices.

The study results is similar with the results of Trifonova et al. (2006) who assumed that participants' gender has a relationship with mobile learning and willingness.

4.6 Relationship Between Mobile Information Literacy and Age of Undergraduate IT Students

One way Anova was done for calculating age groups effect over MIL (15-17, 18-24, 25-29 and 30+). Age grouping was done while doing data analysis because the questionnaire had no grouping about age so according to the 6^{th} research question age limit was 17 and underage (minimum 15) and 18 and above (30+) the grouping was done for analyzing the data. However, mobile information literacy did not fluctuate considerably for any age group in all 23 items ($p>0.05$). Hence, no relationship was seen between age group of undergraduate IT students groups (15-17, 18-24, 25-29 and 30+) and MIL. Furthermore, the findings of this research were not the same as the findings of a study about technological approach which described

that respondents' age group has a relationship with mobile learning and usage of mobile devices in students (Maccallum & Jeffrey, 2004).

4.7 Relationship Between Mobile Information Literacy and Year of Study Level of Undergraduate IT Students

To check the relation between MIL and year of study level (1^{st}, 2^{nd}, 3^{rd} and 4^{th}) of undergraduate IT students in Pakistan, Anova test was done to find the results. The results of the Anova test showed that out of 23 items, only 3 items had a significant difference regarding year level of undergraduate IT students of Pakistan. Table 4.26 shows the expressive data results having frequency (n), SD and a mean value for item 12. It reveals the relation of usage behaviors of mobile devices for educational purposes between year levels of undergraduate IT students in Pakistan.

Table 4.26: Students' Opinion on Authority being Constructed and Contextual

	Frequency (n)	Mean (x)	SD
1^{st} year	78	2.94	1.12
2^{nd} year	109	2.96	0.93
3^{rd} year	88	2.57	1.11
4^{th} year	225	3.00	1.08
Total	500	2.91	1.07

Table 4.27 demonstrates the Anova test results that contains sum of square, SD, Mean square, p and f for item 12 which shows a relation in MIL and year of study.

Table 4.27: Mobile Information Literacy Depends on Year of Study for 12^{th} Item

Variable source		Sum of square	SD	Mean square	F	P	Sig. Difference
Mobile Information Literacy	Between groups	12.45	3	4.15	3.66	0.01	$1^{st} – 3^{rd}$
	Within groups	562.12	496	1.13			$2^{nd} – 3^{rd}$
	Total	574.58	499				$4^{th} – 3^{rd}$

For finding out the relationship between MIL and year of study, Anova test was conducted to calculate year of study's impact on MIL for each year individually. According to Table 4.26 estimation mean for MIL has changed with each year of study for item 12 was different as well as presented in the P value of Table 4.27. An important difference was seen in year of study level on MIL of undergraduate IT students in Pakistan ($p<0.05$) for three constraints [$F(3, 496)=3.66$, $P=0.01$].

A post hoc test results displayed for item 12 which shows mean value of 1st year students ($X=2.94$, $SD=1.12$) is similar with second year students ($X= 2.96$, $SD= 0.93$) and student of 4th year ($X=3.00$, $SD=1.08$) but it is different from the students of 3rd year ($X=2.57$, $SD=1.11$). Students of 2nd year ($X=2.96$, $SD= 0.93$) are similar to 1st and 4th year students but differs with 3rd year students ($X= 2.57$, $SD=1.11$). Similarly 4th year students are identical with 1st and 2nd year students but are different with students of third year ($X=2.57$, $SD=1.11$).

Table 4.28 shows results about relation of usage behaviors of mobile devices for educational purposes between year levels of undergraduate IT students in Pakistan.

Table 4.28: Students Opinion on Accessing Information Using ICTs

	Frequency (n)	Mean (x)	SD
1st year	78	3.35	1.09
2nd year	109	3.01	1.30
3rd year	88	2.68	1.28
4th year	225	3.19	1.29
Total	500	3.09	1.27

In table 4.29 Anova test results were shown with sum of squares, SD, Mean square, P and F for item 19 that demonstrate relation in MIL and year of study.

Table 4.29: MIL Depends on Year of Study for 19th Item

Variable source		Sum of squares	SD	Mean square	F	P	Sig. difference
Mobile Information Literacy	Between groups	22.78	3	7.59	4.75	0.003	1st – 3rd
	Within groups	792.51	496	1.59			
	Total	815.30	499				4th – 3rd

For finding out the relationship between MIL and year of study, Anova test was conducted for calculating year of study's effect on MIL for each year (1st year, 2nd year, 3rd year and 4th year). Mean estimation on MIL has changed with each year of study for item 19 was different. Major difference was seen in year of study level on MIL of undergraduate IT students in Pakistan ($p<0.05$) for three constraints [$F(3,496)= 4.75$, $P=0.003$]. For 19th item, the results of post hoc test displayed 1st year value of mean ($X=3.35$, $SD=1.09$) is similar with 2nd year learners ($X=3.10$, $SD=1.30$) and students of 4th year ($X=3.19$, $SD=1.29$) but is different from students of 3rd year ($X=2.68$, $SD=1.28$). Students of the second year ($X=2.96$, $SD= 0.93$) are similar to 1st, 3rd and 4th year students. Similarly 4th year students are identical with 1st and 2nd year students but are different with students of third year ($X=2.68$, $SD=1.28$). Table 4.30 has results of descriptive statistics for item 20. It reveals the relation between the usage behaviors of mobile devices for educational purposes between year levels of undergraduate IT students in Pakistan.

Table 4.30: Students' Perceptions on Instant Access of Information and Critical Thinking

	Frequency	Mean	SD
1st year	78	3.32	1.24
2nd year	109	3.01	1.27
3rd year	88	2.84	1.23
4th year	225	3.22	1.36
Total	500	3.12	1.31

Table 4.31 displays Anova test results for sum of squares, F, P, SD and mean for item no 20 that will describe the relation between MIL and year of study.

Table 4.31: Mobile Information Literacy Depends on Year of Study for 20th Item

Variable source		Sum of squares	SD	Mean square	F	P	Sig. difference
Mobile Information Literacy	Between groups	13.67	3	4.55	2.68	0.04	1st – 3rd
	Within groups	843.64	496	1.69			
	Total	856.31	499				4th – 3rd

For finding out the relationship between MIL and year of study, Anova test was conducted to get effect of study year on MIL for 1st, 2nd, 3rd and 4th year.

According to Table 4.30 mean estimation for MIL has changed with each year of study for item 20 was different as well as a P value was presented in table 4.31. There was a significant difference seen in year of study level on MIL of undergraduate IT students in Pakistan ($p<0.05$) containing 3 constraints [$F(3.496)= 2.68$, $P=0.04$].

For 20th item, results of post hoc test were displayed which says that the mean value of first year students (X=3.32, SD=1.24) looks alike with 2nd year (X=3.01, SD=1.27) and 4th year (X=3.22, SD=1.36) but is different from 3rh year (X=2.84, SD=1.23). The 2nd year learners (X=3.01, SD=1.27) are similar to 1st, 3rd and 4th year learners. Likewise 4th year learners are similar with 1st and 2nd year but are different with 3rd year students (X= 2.84, SD=1.23).

Additionally, out of all 23 items, 20 items had no significant difference among the year of study level but 3 items had a significant difference. 1st undergraduate learners had highest mean value while 3rd year learners had lowest mean value. Results point out an importance difference between year of study level and MIL.

Correspondingly, the findings suggest that year of study is an important determinant for MIL of undergraduate IT students in Pakistan. Therefore, there is a relationship between MIL and 1st year undergraduate IT students, consequently proving that 1st year undergraduate IT students are more ready for mobile technologies and information technologies. It can be said that earlier facts of MIL systems is a significant factor influencing MIL, hence, since 1st year IT students were said to have better understanding of mobile technologies and more exposure because of their year levels, it was anticipated that they had the maximum mean scores.

Additionally, the result gotten from these findings are similar to the findings of Elogie (2015) which indicated that year level is said to have major effect on mobile information and literacy in learners.

Chapter 5

CONCLUSION

This thesis was carried out for inspecting attitudes and awareness level between undergraduate IT students in Pakistan towards Mobile Information Literacy and how it can differ between age, gender, and year level of the students.

Quantitative research and survey method using the Mobile Information Literacy (MIL) Scale for data collection tool which was applied in the Comsats University Islamabad in Pakistan. The research group consisted of 500 registered undergraduate IT students at CUI who contributed in survey voluntarily. Descriptive analysis was done to get data analysis.

Arithmetic mean (x), Frequency (f), Percentage (%), Independent T-test, Anova and Post Hoc test were used for the data analysis. T-test was used for two groups like gender and Anova was used for more than two groups such as relationship between different age groups and MIL and year levels of students and MIL.

The findings drawn from this study illustrates that undergraduate IT students have high level of perceptions towards the acceptance and use of MIL with reference to their sub-divisions Informationally Literate University, Informationally Literate Person, Framework of Information Literacy and ICTs and Students.

As stated in this study, the undergraduate IT students' MIL perceptions and attitudes are same depending on the age of the participant, which proves that age is not an important factor and consequently has no relationship with the students' perception about MIL.

Additionally, the research verified the undergraduate IT students' perceptions about mobile information technologies and literacy has a difference between gender levels. Female undergraduate IT confirmed that they are more aware of technologies being used at educational level. Female student tend to be more interested and trying new technologies and were positive about advancement.

Conversely, the study findings proposed that the perceptions about MIL are not same based on the year of study of participants. Findings revealed a relationship in between years of study level undergraduate IT students with their perceptions about MIL.

In wrapping up, the thesis results indicate the undergraduate IT students of CUI in Pakistan show high levels of positive attitudes and perceptions towards MIL and technology literacy in reference to their level of Informationally Literate University, Informationally Literate Person, Framework of Information Literacy and ICTs and Students.

Furthermore, no relationship exists between ages of the students' perceptions about MIL. Conclusion of the thesis is female under graduate IT students from Pakistan have a significance influence regarding their perceptions and attitudes about MIL. The other finding of the study is 1st year students of undergraduate from IT

department showed difference in perceptions about MIL which illustrates that 1st year IT students of Undergraduate have much awareness about mobile information literacy. Further research about the study is to repeat this survey in other universities in Pakistan as well because this study was limited to only one university and to undergraduate IT students. The author's future work will also be about assessing the perception levels of high school students in Pakistan about MIL.

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APPENDICES

Appendix A: Demographic Survey

Dear student, this survey is a part of my research project about assessing perceptions of students on Mobile Information Literacy. I clarify that this is totally unidentified and confidential about private info of the participants. These five questions are about your PERSONAL AND ACADEMIC DATA.

Section 1

1. Gender

- Woman
- Man

2. Age

3. Nationality

4. Year OF Study

- 1st
- 2nd
- 3rd
- 4th

5. Teaching Method

- In-Person
- blended
- online

Appendix B: Mobile Information Literacy Survey

Section 2

Main Questionnaire

Here are 23 items under four sub-divisions. You have to rate your level agreement about each item, the answer level varies from 1-5in which 1= strongly disagree, 2= disagree, 3=DK/NO (Don't Know or No Opinion), 4=agree and 5=strongly agree.

1. Informationally literate University

	Strongly disagree	Disagree	DK/NO	Agree	Strongly agree
1. Is future of higher education	○	○	○	○	○
2. promotes critical and reflective thinking in the education community	○	○	○	○	○
3. Fosters lifelong learning	○	○	○	○	○
4. Makes the teaching learning process easier	○	○	○	○	○
5. Assumes that teaching will be an increasingly ubiquitous or blended nature	○	○	○	○	○

2. An Informationally Literate Person is the one who

	Strongly Disagree	Disagree	DK/NO	Agree	Strongly agree
6. knows how to identify their information needs	○	○	○	○	○
7. understands and uses relevant and quality information sources	○	○	○	○	○

	Strongly Disagree	Disagree	DK/NO	Agree	Strongly agree
8. uses varied information resources (websites, e-books, books, article etc)					
9. evaluates information sources in critical manner					
10. properly cites the information sources used					
11. knows how to disseminate in an appropriate manner					

3. Framework of Information Literacy

	Strongly Disagree	Disagree	DK/NO	Agree	Strongly agree
12. Authority is constructed and contextual					
13. creating information is a process					
14. information has value					
15. research is a process of questioning					
16. learning is dialogue					
17. search for information requires a strategy					

4. ICT & students

	Strongly disagree	Disagree	DK/NO	Agreee	Strongly agree
18. I usually search for information on mobile devices	○	○	○	○	○
19. I believe that I am able to access all information I need using ICTs and mobile devices	○	○	○	○	○
20. instant access to information improves my critical thinking skills when selecting verified information and documents	○	○	◉	○	○
21. the use of ICTs and mobile devices lowered the importance I give to citing sources	○	○	○	○	○
22. mobile devices have contributed me being more distracted in class	○	○	○	○	○

23. I usually take notes on mobile devices for information

Appendix C: Consent Form

Department of Computer Science

Comsats University Islamabad

Islamabad, Pakistan.

Tel: +92-51-9247000-9247002

Web: https://www.comsats.edu.pk/Default.aspx

An assessment on the perception levels and attitudes of undergraduate IT students about Mobile Information Literacy in Pakistan

Respected participant,

Please spare some moments to have a look at the data of this research cautiously. Before you willingly contribute "if you any query regarding the study any time, please feel free to enquire the researcher about your query and get information".

This thesis is carried out by AMNA ZAHID under supervision of Asst. prof. Dr. Hasan Oylum and Asst. Prof. Dr. Nilgun Suphi. The study aims to examine the attitude and perception levels of undergraduate IT students on Mobile Information Literacy in Pakistan. The survey will not take more than 6-8 minutes to complete.

Certainly, you are not bound to contribute in the survey; you are free to refuse the participation. You can even leave the survey at any point not even giving a reason. In this case your response will be destroyed and will not be a part of the thesis. Your name and other private information will be kept confidential.

From the remaining questionnaire, data will be stored for maximum 6 years after the study, once the data analysis is done the result report can be submitted for publications

Please fill the approval form below to ensure your charitable contribution to the study.

Approval Form:

Title of the study: An assessment of perceptions a nd attitudes of undergraduate IT students about mobile information literacy in Pakistan

Researcher: Amna Zahid , amnazahid660@gmail.com

For agreeing on all the statements below, please tick the boxes.

- ☐ I certify that I have read and understood the information provided about the thesis
- ☐ I understand that my contribution the study is willingly and I can withdraw anytime I want
- ☐ I agree to take part in this survey

Date:

Signature

Appendix D: Consent Form from Institute for Data Collection

COMSATS University Islamabad
Wah Campus
G.T. Road, Wah Cantt. Punjab, Pakistan

TO WHOM IT MAY CONCERN

Amna Zahid (FA14-BSE-145), currently doing MS at Eastern Mediterranean University (Turkey) approached me for writing a letter of permission for conducting a survey on her research topic, "An assessment of attitudes and perceptions of Undergraduate students on mobile information literacy in Pakistan". I am pleased to write this letter in support of Amna Zahid who has been one of my students during her Bachelors in Software Engineering, BS (SE) at the Department of Computer Science, COMSATS Institute of Information Technology during Fall 2014 - 2019.

I hereby allowed her to conduct the survey / study and distribution of questionnaire to the students of COMSATS University.

Feel free to contact undersigned, in case of any query.

Dr. Muhammad Wasif Nisar
Associate Professor
Department of Computer Science
COMSATS Institute of Information Technology
Wah Cantt. Pakistan
+92-500-9115452
wasif@ciitwah.edu.pk

Appendix E: Ethics Committee Approval Letter

Doğu Akdeniz Üniversitesi

Eastern Mediterranean University

Etik Kurulu / Ethics Committee

Reference No: ETK00-2020-0149 11.06.2020

Subject: Your application for ethical approval.

Re: Amna Zahid
Faculty of Education.

EMU's Scientific Research and Publication Ethics Board (BAYEK) has approved the decision of the Ethics Board of Education (date: 05.06.2020, issue: 2020/71) granting Amna Zahid from the Faculty of Education to pursue with his/her MA thesis work titled **"An assessment of attitudes and perceptions of undergraduate students on mobile information literacy in Pakistan"** supervised by Assist. Prof. Dr. Hasan Oylum and Assist. Prof. Dr. Nilgün Suphi.

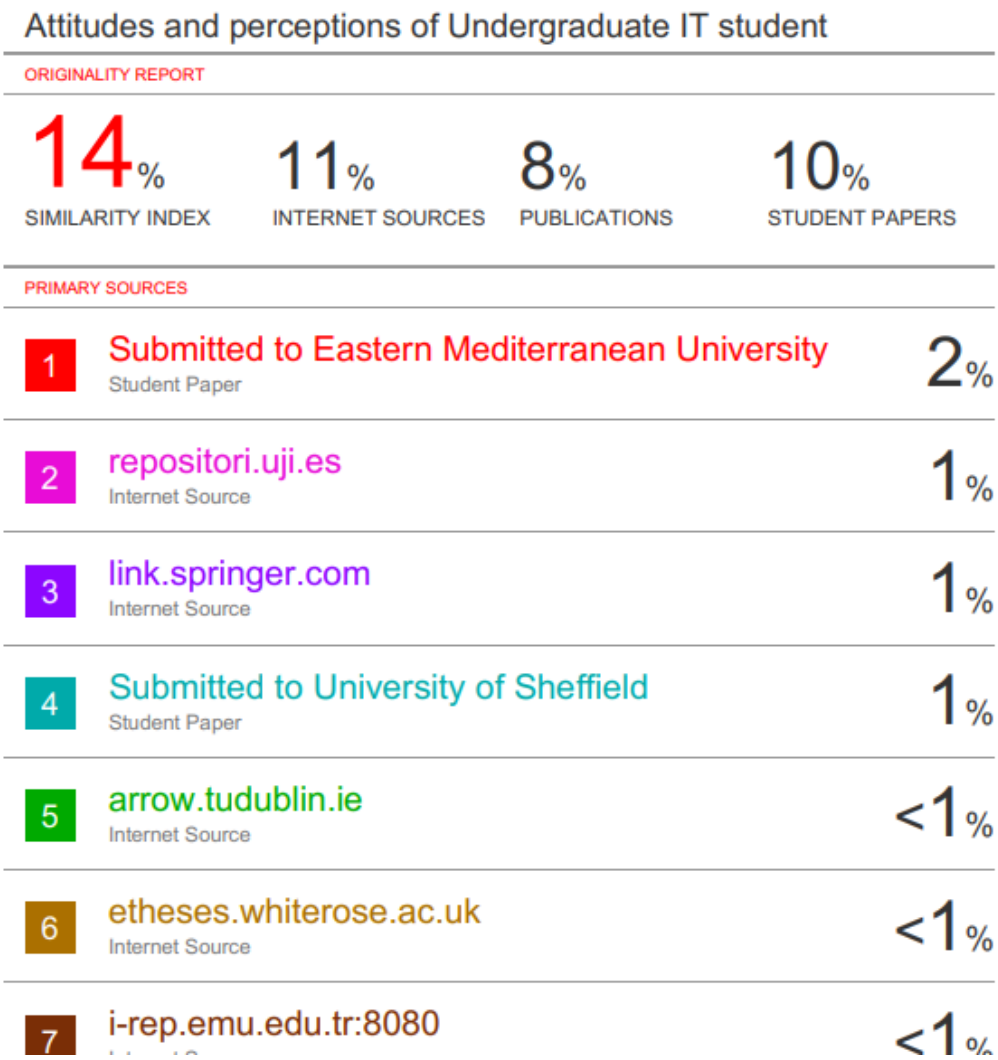
Prof. Dr. Yücel Vural

Chair, Board of Scientific Research and Publication Ethics - EMU

YV/ns.

www.emu.edu.tr

Appendix F: Originality Report



Attitudes and perceptions of Undergraduate IT student

ORIGINALITY REPORT

14%	11%	8%	10%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Submitted to Eastern Mediterranean University Student Paper	2%
2	repositori.uji.es Internet Source	1%
3	link.springer.com Internet Source	1%
4	Submitted to University of Sheffield Student Paper	1%
5	arrow.tudublin.ie Internet Source	<1%
6	etheses.whiterose.ac.uk Internet Source	<1%
7	i-rep.emu.edu.tr:8080	<1%