

**Report on**  
**Factors enabling the willingness to adopt**  
**mobile learning**

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## **CERTIFICATE**

This is to certify that the dissertation report titled “**Factors enabling the willingness to adopt mobile learning**” is a bonafide work carried out by **Mr. Akash Jain** of **MBA 2015-17** and submitted to Delhi School of Management, Delhi Technological University, Bawana Road, Delhi-42 in partial fulfillment of the requirement for the award of the Degree of Masters of Business Administration.

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**Place:**

**Date:**

## DECLARATION

I, **Akash Jain**, student of **MBA 2015-17** of Delhi School of Management, Delhi Technological University, Bawana Road, Delhi – 42, hereby declare that the dissertation report “**Factors enabling the willingness to adopt mobile learning**” submitted in partial fulfillment of Degree of Masters of Business Administration is the original work conducted by me.

The information and data given in the report is authentic to the best of my knowledge.

This report is not being submitted to any other University, for award of any other Degree, Diploma or Fellowship.

**Place:**

**Akash Jain**

**Date:**

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## **Abstract**

Mobile learning (M-learning) provides a new learning platform in which learners can access the content and just in time information as required irrespective of the time and place. Mobile learning is evolving at a very high rate all across the globe and one of the major reasons behind is that it uses mobile platform. The accessibility of mobile devices like smartphones, tablets, I-pads, personal digital assistants, E-readers etc. has increased drastically over the period of time.

Technology Acceptance Model (TAM) has been shown to be a valid and powerful model in mobile and other learning technologies research. Based on Technology Acceptance Model theory, this research aims to find the factors enabling the willingness to adopt mobile learning. Perceived usefulness and perceived ease of use are the two important factors for technology acceptance. External factors like affordability, enjoyment, interaction and convenience have been analysed in this research to see their influence on willingness to adopt mobile learning.

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## CHAPTER I

### 1. INTRODUCTION

Learning is a broad term that happens both lifelong and life-wide. Education is considered a subset of learning that can drive growth, economic prosperity and advancement of an individual, a community and a country. Learning doesn't need an institution and can happen informally. Education often happens in an institutionalised manner in a more formalized way. Yet, in the kind of education system that children are going through, they are educated inside the four walls of a classroom and learning often happens outside it. This kind of a boundary is not preparing students effectively to become the global citizens of 21st century. Imagine a world where the boundary between formal and informal ways of learning are blurred, learning and education become synonymous and ubiquitous, independent of time, available materials, resources, previous qualification, pace and style. Technology, especially Mobile technology has the potential to achieve such a transformation.

#### 1.1 E-learning

E-learning is a learning system which is based on formal teaching with the help of the electronic resources. While teaching can be based mostly in or out of the lecture rooms, the utilization of computers and also the net forms the main part of E-learning. E-learning may also be termed as a network enabled transfer of skills and information, and also the delivery of education to a vast variety of recipients at similar or completely different times. Earlier, it had been not accepted wholeheartedly because it was assumed that this method lacked the human part needed in learning.

However, with the rapid progress in technology and the technological advancements in the learning systems, it is now adopted by the many. The introduction of computers was the premise of this revolution and with the passage of time, as we are adapting to smartphones, tablets, etc., these devices now have a very important place in the classrooms for learning purposes. Books are now slowly getting replaced by electronic educational materials like PowerPoint presentations with the help of projectors. Knowledge can also be shared via the web, which can be accessed anywhere, anytime.

E-learning has proved to be the most effective mean in the corporate sector, particularly for the training programs. These training programs are conducted by companies for employees across the world making employees obtain important skills while sitting in a board room, or by having seminars, which are conducted for members of the same or the different companies under similar roof. The schools which use E-learning technologies are leading ahead to those which still use the traditional and standard approach for learning.

Undoubtedly, it is equally important to keep the concept of non-electronic or traditional teaching alive with the help of books and lectures, but the usefulness and effectiveness of technology-based learning should not be taken lightly or ignored completely. It is believed that the human brain can easily recall and relate to what is viewed and heard via audio visuals or interactive format. It has also been found that visuals, apart from maintain the concentration of the learner, are also retained by the brain for longer time periods. Various fields, including services, business, healthcare, education, and government setups are adopting to the concept of E-learning.

## **1.2 M-learning**

M-learning or mobile learning can be explained as "learning across multiple contexts, through Interaction and content interactions, using personal electronic devices." It is one form of distance education where mobile-learners use this technology at their time and as per their convenience.

M-learning technologies include notebooks, mobile phones, tablets and I-Pads. M-learning has major focus on the mobility of the student and allow interaction with portable technologies. Using mobile tools for creation of learning aids and materials has become a very important part of informal learning.

M-learning is convenient and it can be accessed from anyplace. Sharing is very fast among anyone who is using the same material, which leads to the reception of instant feedback. M-learning also brings strong portability by substituting books and registers with technical devices, filled with personalized learning contents. Mobile learning is the delivery of learning, education or learning support on mobile phones or tablets. E-learning has provided the



ability for traditional learning to move out of the classrooms and for students to learn at their place. Mobile learning has further boosted e-learning by taking it a step ahead and allowing students to learn virtually anywhere.

### **1.3 Present Scenario**

Currently there are two programmes for m-learning which are highly popular across the globe. First one being “One-to-One (1:1) Programmes”, under which all the students are provided with their own mobile devices without any cost to the students or their families. The second programme which has got a lot of popularity is “Bring Your Own Device (BYOD)” initiative, in which students carry their own devices to the institutes. These programmes are in the formal education setting. In informal education setting there are a lot web portals and mobile applications present which are boosting the m-learning.

The concept of m-learning can be a blessing for India’s education system. The growth of a nation bank on the education system adopted by it to groom the future generation. With the development of mobile technology in all sectors, it has become a necessity for India to renovate and upgrade the present education system. Although there are numerous future plans that are in various stages of implementation, at present aim should be to reach vast masses with minimal investment. Nothing but mobile devices can facilitate in the quick adaptation of smart and modern education systems. This can be due to the fact that India has the 2<sup>nd</sup> largest mobile user subscription base in the world, with more than nine hundred million mobile phone users. Mobile devices are also popular even in rural areas where other infrastructure is not present. This growing presence of mobile phones, the boundless availability and adoption of mobile internet technology and market penetration of economical mobile devices are the important reasons for the use of mobile technologies for providing education in India.

Many steps have been initiated by the government of India to boost e-learning. One of the most outstanding one is the setting up of the “National Program on Technology Enhanced Learning (NPTEL)” by the HRD ministry of India. The mission of this program was to develop visual lectures based on curriculum and internet courses to strengthen the quality of engineering education in

country. The programme became a huge success that resulted in triggering the setup of more such programmes across the country by both public and private parties.

Both the e-learning & m-learning are very closely related to each other with the only difference being in the devices used for accessing the content. Another key feature of mobile learning is that for mobile learning content to provide 100% end user experience, it is crucial to keep note of some parameters like layout and format of the content as there are certain limitations that are present in mobile device design.

In the Indian context following are certain example for mobile learning.

### **Flipped classrooms:**

This is a modern education delivery system that is changing the education sector all across the globe. It uses a mixture of traditional face-to-face teaching as well as offline learning approach to make the learning a whole new experience. It involves developing the understanding of initial basic concepts of a subject by watching lecture videos and then meeting with the experts/teachers after that to resolve doubts and for the practicing the advanced concepts for which personal guidance is necessary. The offline videos can be saved from the website and can be viewed using the mobile devices anytime and live meeting with the faculties is also possible using these mobile devices.

Another form of flipped classrooms that can boost the current education system in country is the concept of Massive Open Online Course (MOOC). MOOC is an open source model for providing good quality learning content/courses on internet to anyone without any cost, without any specific constraints on attendance, occupation, location or age. The basic philosophy of MOOCs is 3A's i.e., Anytime, Anyone, Anywhere. Leading global institutes have already joined MOOC platforms or initiated their own MOOC initiatives. Together, they moderate large number of courses. The response from Indian students and faculties for MOOC courses has been terrific. Worldwide Indians form the 2<sup>nd</sup> biggest pool of students opting MOOC courses. Some of the top MOOCs providers are Coursera, Udemy, Simplilearn and Khan Academy.

Steps like MOOCs when merged with their accessibility using mobile devices will surely boost in providing high quality education anytime, anyplace to Indians who have been underprivileged of it for different reasons.

### **Learning by games:**

Mobile games have always been a popular option to kill time for people belonging to all age groups. Game-based learning means the usage of games as a medium for learning and understanding some particular concepts. The benefit of this game-based learning is its effectiveness in grabbing and holding the interest and concentration of the learner throughout the complete learning process. Numerous mobile applications for learning concepts mathematics, Science, Engineering etc. are already available in the mobile application store.

### **Tailored learning:**

For learning people have their own choices of the preferred mode of learning. For instance, few learners would like to read and learn while other few would choose to view a video and understand a concept. As there has been growth in the field of learning analytics, it has become possible to present content in a preferred mode of learning for each individual. Learning analytics is the application of analytics to the data collected from each learner to track their personal choices with respect to numerous aspects like type, format, and depth of content being covered in the courses. This would boost the learning experience for every learner.

### **Interaction learning:**

Interaction learning is the use of latest technologies like blogs and communities to promote learning by collaboration and sharing of information. Presently many Interaction media networks like Facebook, LinkedIn & Twitter have also contributed their share to learning by forming communities and holding question and answer sessions with experts in numerous streams. The most prominent usage of mobile phones is for using Interaction or social media networks. Such learning support provided by Social media networks will surely support in promoting Interaction learning using mobile devices.

**National Digital Library:**

Under its National Mission on Education through Information and Communication Technology, Ministry of Human Resource Development has developed the National Digital Library (NDL) project to develop a plan of virtual repository of learning resources with a single-window search facility. Filtered searching is used to facilitate focused searching so that individuals can find out the apt resource with minimal effort and in very less time. NDL is designed to keep content of multiple languages and provide interface support for leading vernacular languages (currently Hindi and Bengali). It is being developed to provide support for all academic levels including researchers and lifelong learners, all disciplines, all popular form of access devices and differently-abled learners. It is being developed to guide students in preparing for entrance and competitive exams, to enable people to learn and prepare from best practices from all across the globe and to facilitate researchers to perform inter-linked exploration from different sources. The pilot project is designing a framework suitable for future scale up with respect to content size and diversity to become a developed National Digital Library of India over time. It is being developed at IIT Kharagpur.

**National Programme on Technology Enhanced Learning:**

The National Programme on Technology Enhanced Learning (NPTEL) is now more than a decade old. It was initially developed by IIT Madras and is still coordinated by them. The program is supported by the ministry of human resources development (MHRD) to take quality education to untapped areas. Over the decade, NPTEL has become one of the most extensive and most viewed education channel in the world. It has more than 18,000 videos on YouTube. Till now more than 860 courses have been recorded and uploaded, with every course having minimum 20-30 lectures. Across the country, numerous colleges are now making NPTEL videos available in campus classes and libraries. In other cases, students from around the country are viewing the lectures on their own either as a substitute or as a supplement to class lectures. Recently, NPTEL launched certification programmes, which have also become popular among students.

**E-pathshala:**

E-Pathshala is part of the digital India campaign and is an “online school”. It provides learning resources for schools as well as individual students — either still in school or studying independently. It covers the entire curriculum prescribed by different Indian education boards. IT is a web portal which provides educational resources for students, faculties, parents, researchers and educators. It is available via especially developed mobile application interface on Android, IOS and windows platforms for wider access. It contains textbooks and other e-books as e-Pub 3.0 and flipbooks in English, Hindi and Urdu. Under this initiative government plans to provide 12,000 higher education resource books available for free.

**E-Balbharti app:**

The Maharashtra State Bureau of Textbook Production and Curriculum Research (Balbharti) launched an application that will let students read textbooks on their mobiles. Textbooks produced by Balbharati are published on ebalbharati.in in pdf format. The pdf e-books can be downloaded free of cost. The policy was aimed at reducing the weight of bags carried by students to school.

**SWAYAM:**

SWAYAM is a programme initiated by Government of India and designed to achieve the three cardinal principles of Education Policy which are access, equity and quality. The objective of this initiative is to take the best teaching learning resources to all, including the most disadvantaged. SWAYAM seeks to bridge the digital divide for students who have hitherto remained untouched by the digital revolution and have not been able to join the mainstream of the knowledge economy. This is done through an indigenous developed IT platform that facilitates hosting of all the courses, taught in classrooms from 9th class till post-graduation to be accessed by anyone, anywhere at any time. All the courses are interactive, prepared by the best teachers in the country and are available, free of cost to the residents in India. More than 1,000 specially chosen faculty and teachers from across the Country have participated in preparing these courses.

The government has also taken other few steps to popularise mobile learning in country like the distribution of Aakash tablets to graduates. However, these steps should be accelerated to make sure that the advantages of mobile learning reach all across India and not stay limited to only the student population.

## **1.4 Objectives**

### **Primary Objective**

- The primary objective of this research is to study the factors enabling the consumer willingness to adopt mobile learning.

### **Secondary Objective**

- To study the relationship between 1Enjoyment, affordability and Usefulness of mobile learning
- To study the relationship between convenience, Interaction and ease of use of mobile learning
- To study the relationship between usefulness and ease of use on willingness to adopt mobile learning
- To analyse gender difference with respect to adoption of mobile learning
- To analyse difference between students and working professionals for adoption of mobile learning

## **CHAPTER II**

### **2. Literature Review**

#### **2.1 Concept of e-learning**

Instructors can use different technologies to enable online-learning, e.g. intranet, internet, CD-ROM, satellite broadcast, etc. (Sorebo, 2009). In today's scenario, due to development and increased usage of information technology, e-learning has become easier thanks to smart phones with broadband and internet connectivity (Monahan et al., 2008). According to the Technology Standard Committee, "e-learning system is a learning technology that uses web browsers as a tool for interaction with learners and other systems". This implies that the system works as a platform to assist teachers and learners (Ferdousi, 2009). In fact, "e-learning is an information system based on the World Wide Web that provides training and development to learners in a dynamic and flexible manner" (Lee and Lee, 2008). National Program on Technology Enhanced Learning (NPTEL) in India is a virtual education site with online lectures for different courses. Most of the lectures are delivered by educators from the top most institutions of India which helps enrich the knowledge and skills of students and trainees in different organizations.

#### **2.2 Importance of e-learning systems**

The emergence of information and communication technology has created immense market potential by providing an opportunity for everyone to teach and learn (Little, 2010). Facilitation of e-learning requires internet and broadband connectivity with proper planning, organizing, monitoring, and controlling. The various digital technologies also support e-learning applications and provide dynamic and flexible e-learning environments (Cantoni et al., 2004). Studies show that e-learning has gained much prominence at national and international platforms, especially in the education sector (Stalling, 2002). Traditional classroom learning has been largely complemented by self-driven online-learning. Such learning allows the learner to absorb information at his or her own pace and enhances engagement levels. The usefulness of e-learning is not limited to the education sector alone. Many Indian companies have utilized e-learning facilities to train employees effectively. Today, most users access the internet through their smart phones

which greatly increases the chances of e-learning adoption. With the increment of number of internet users in India which expected to reach 250 million, compare to USA and second only to China, India's have developed the large market for e-learning. The online education market of India is set to grow to \$40 billion by 2017 from the present \$20 billion. The education system of India is considered as one of the largest education systems in the world with an association of more than one million schools and 18,000 higher education institutions. Almost more than half of the country's 1.2 billion strong population forms the target market for education and related services (Chatterjee, 2014).

### **2.3 Concept of m-learning**

The concept of m-learning (mobile learning) is presumed to have emerged from distance learning (d- learning) to electronic learning (e-learning) (Sharma & Kitchens 2004). The popularity of mobile learning can be credited to the development of iPads and smartphones that work through wireless technology (Park et al. 2012). M-learning can be summarized as the acquisition of any information & skills by using of mobile technologies at anyplace and any-time (Liu et al. 2010). To understand better it can be said that mobile learning is learning is through mobile-devices like of smartphones, tablets, computers, personal digital assistants (PDAs), MP3s and MP4 devices as well as other portable device (Milošević et al. 2015). Devices like these are handy (convenient for holding in hand and do not require to be installed on a computer), compact (can be taken or carried anywhere easily in a handbag or pockets and have easy battery charging options) and also lightweight (device do not weigh a lot) (Nordin et al. 2010). The advancement of Social media and its free applications and software allow easy communication and boost m-learning (Rodriguez 2011).



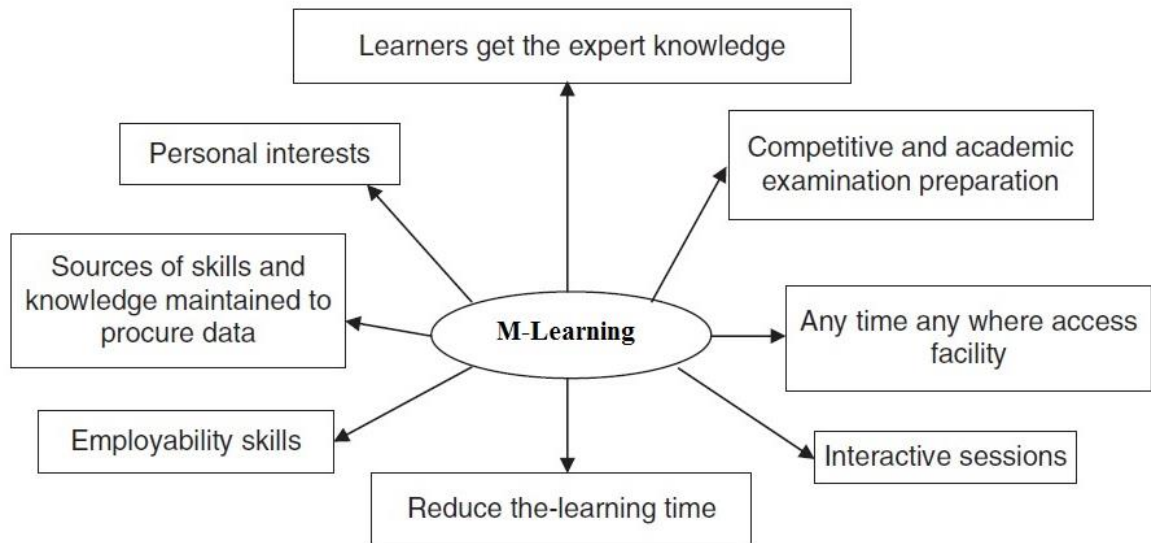


Fig. 2.1 Significance of M-Learning (Source: Agrawal, 2016)

## 2.4 E-Learning Vs M-Learning

In the present era of technology, e-learning is also taken over by m-learning, which is the latest innovative mechanism in learning process in educational institutes. Another definition that provide significant base to differentiate between m-learning from e-learning is: “term e-learning includes a wide range of applications and processes, including web-based learning, virtual classrooms and digital collaboration, etc. E-learning can be defined as the delivery of content via electronic media including Intranet, Internet, Extranets, audio-video tape, satellite broadcast, interactive TV, and CD-ROM”. M-learning on the other hand is a subject of e-learning. It is the macro concept that includes online and mobile learning environments” (Urdan and Weggen, 2008). Quin (2009) explained mobile learning as “e-learning through mobile computational devices like palms, windows CE machines, even digital cell phone”. He aptly remarked that “mobile learning is indeed an e-learning because under this learning various electronic gadgets as well as computer software are utilized to enhance learning process”

## 2.5 The Current State of Mobile Learning

Currently, cell phones which were at first advertised firmly as communication and entertaining gadgets are now becoming an imperative part in economies and society at large. Cell phones have affected almost each and every task, from managing an account to governmental issues, and are presently being

utilized to build profitability in various fields. As these gadgets turn out to be progressively noticeable around the world, mobile learning is also getting lot of attraction. Students and faculties are utilizing this technology for various educational purposes while the government is also being supportive in making policies to promote this innovative method of mobile learning in both formal and informal education setting. Many local educational institutes are also adopting this technology due to its advantages. The specialists in education sector believe that m-learning has now reached to level where its systematic integration with learning both inside and outside of institute's premises is necessary. Choices made today will definitely impact the significance of m-learning in years to come. Some of the latest trends in m-learning are as follows. It includes the innovations in formal and informal education.

### **2.5.1 Formal Education**

The significance of mobiles in formal education systems is increasing. Worldwide, there are two programmes for m-learning which are highly popular. First one being “One-to-One (1:1) Programmes”, under which all the students are provided with their own mobile devices without any cost to the students or their families. The second programme which has got a lot of popularity is “Bring Your Own Device (BYOD)” initiative, in which students carry their own devices to the institutes. Students who have difficulty in affording these devices are supported by institutes which provide them subsidized devices. Generally, the One-to-One model tends to be more prevalent in poorer countries and regions, while the BYOD programme is commonly executed in wealthier communities where possessing a mobile device among youngsters is very common.

#### **Bring Your Own Device (BYOD)**

One suitable way create a One-to-One environment is by using the mobile devices that students already possess. This model, known as Bring Your Own Device (BYOD), is now causing a big change in higher education and distance learning by enabling more and more students to access the course contents through mobile technology. As mobile devices reach and possession increases, BYOD has a lot to give for students across the globe, though it might appear very different around various regions and countries. While this

programme has been highly popular in regions and communities where mobile devices possession is widespread, students and instructors have also discovered ways to capitalize on less sophisticated student owned technologies. “The Nokia MoMath project in South Africa, for instance, uses the SMS (Short Message Service) features on standard mobile phones to provide students with access to mathematics content and support” (Isaacs, 2012b). While BYOD transfers the hardware costs from the institutes to the students, it puts an extra pressure on bandwidth which is a critical infrastructure requirement for m-learning technology. Institutes or government executing the BYOD programme should also have a strategy in place to supply devices to learners who have difficulty in affording them, either by purchasing the device for them or by providing subsidies to them. Other issues include security, privacy, adequate professional development for faculties, and a digital gap between learners with latest gadgets and those with less effective gadgets or none at all. Because of such reasons, cases of successful BYOD programmes, specifically in primary and secondary institutes, are quite less. “However, as sophisticated mobile technologies become increasingly accessible and affordable, BYOD may form a central component of mobile learning projects in the future” (Norris and Soloway, 2011).

### **2.5.2 Informal Education**

To a very large extent the m-learning technology has been developed outside the context of formal education and a large amount of m-learning projects have been developed and designed for informal education setting.

### **Seamless Learning**

“Seamless learning is defined as uninterrupted learning across different environments, including formal and informal settings”. In an ideal example of seamless learning, a learner opportunistically uses various kinds of technologies, capitalizing on the unique affordances of each- the mobility of a smartphones, for example or the superior keyboard on a desktop computer – to maintain continuity of the learning experience across a variety of devices and settings. Historically, there has been a significant divide between the formal learning that happens inside a classroom and the informal learning that

occurs at home or in community environments. Numerous experts are investigating how mobile learning might help break down that barrier and bridge the gap between formal and informal learning.

## **2.6 Educational Technology**

Latest advancements in the mobile technology have mostly been around the development of digital content, majorly in the form of digital books or e-books accessed through e-readers. Other thing on which major focus has been is the development of various mobile applications (applications) and software platforms for accessing educational resources through mobile devices.

### **Digital Textbooks and E-Readers:**

In formal education setting in the developed world, the transition of books to digital textbooks is one of the most established mobile learning trends. As e-readers and e-reading applications continue to develop and grow, the experience of reading electronically is increasing becoming more pleasurable and conducive to learning. “New approaches to textbook conversion and creation are moving away from mere digital reproductions of printed text to visually rich interfaces that can include multimedia, interactive and collaborative elements” (GSMA, 2011). The coming generations of smartphones and tablets will provide new methods for educating and learning. “For example, e-books could enable a more Interaction form of study, with a group of students collaborating to read, annotate and compare one or more texts on the same topic, each working from their individual mobile device” (Sharples et al., 2012). “Future e-books would utilize the technologies built into mobile devices like voice recorders, cameras, timers, GPS (Global Positioning System) locators, accelerometers, compasses & tilt sensors, for exploratory learning, navigating the learner through experiments like testing the properties of light using the inbuilt camera of device or sound using the recorder” (Sharples et al., 2012). As smartphone, tablets & e-readers technology enhance in the quality and gets cheaper, this transition towards the digital textbooks could boost the educational opportunities for learners around the globe, particularly for those who presently do not have access to high-quality physical educational materials.

## **Mobile Applications:**

Marketplaces for mobile applications have provided a completely new distribution method for content, stimulating substantial investment in software development for mobile devices. Educational applications are already achieving significant boom in developed nations. These applications provide latest tools for educational tasks like annotation, calculation, composition and content creation. “A recent study found that 270 million applications linked to education were downloaded in 2011 – a more than tenfold increase since 2009” (McKinsey & Company and GSMA, 2012). “While a small number of educational applications are mapped to curriculum targets and designed for use in classroom or homework settings, the majority are intended mainly for informal learning” (GSMA, 2011). However, as more learners start using mobile devices in formal education settings, applications will be likely become a crucial part of the m-learning technology. Not only are developers now able to sidestep institutes and sell software & apps directly to learners, but students, teachers and schools alike will be able to make small, incremental investments in micro-sized pieces of content. For instance, rather than putting money in the similar textbooks or softwares for a complete class, institute, city or nation, instructors will be able to opt from various applications that are personalised to every single learner, powering the tailored learning that is expected to characterize formal education in the future. Some of the popular educational applications available on mobile devices are Udemy, Ted, Duolingo, Wikipedia, etc. There are vast number of applications available for different mobile operating systems for preparation of competitive exams like UPSC, IIT-JEE, CAT, etc.

### **2.7 Uses of m-learning in higher education**

The utilization of mobile learning in higher education can go from basic applications to support conventional methods of teaching to more advanced systems which are developed particularly for the mobile learning educational modality. Patten et al. (2006) asserted that “the use of mobile devices in higher education can generally be classified into three categories namely administration functions (e.g. calendaring and timetabling); reference functions (e.g. e-books and dictionaries) and interactive functions (response and

feedback activities).” There are numerous possible applications of mobile technology for both formal and informal education setting. Mobile learning through smartphones, tablets and I-Pads can be used being to make, gather and access useful resources to communicate inventively in various ways with other individuals and communities as well as to maximize their time wherever they happen to be. Some examples of mobile learning methods are as follows:

- Using SMS to communicate with schoolmates and instructors regarding classroom tasks, notes of different projects, including delivery of essays, study gatherings, doubts etc. (Goh et al. 2011; Grönlund and Islam 2010; Hayati et al. 2012; Motiwalla 2007).
- Participating in discussion forums or video classes via smartphones.
- Accessing learning management systems (which are particularly developed for mobile devices) to finish a course, communicate with other students and sharing information with each other, searching for course materials or posting material anywhere and anytime (Beckmann 2010; Chen and Huang 2010; Saccol et al. 2011).
- Listening to podcasts of comments or lecture syntheses recorded by an instructor or student after a class or at any other time (Beckmann 2010; Evans 2008).
- Learning through educational games and applications developed for mobile devices (Brown et al. 2011; Liu et al. 2010)
- Accessing Interaction networks such as Facebook, Twitter or LinkedIn on mobile devices to exchange knowledge or engaging in informal learning activities (Ferreira et al. 2013).
- Reading news and current affairs to stay updated about everything happening out in the world.
- Watching online videos on various course related topics to understand the concepts or getting extra insights.
- Recording the class lectures (audio or video) to use them again when required.

## **2.8 Benefits of m-learning:**

There are numerous advantages of using mobile learning are. Some of them are as follows:

- Mobile devices, Personal Digital Assistants or tablets and e-books are lighter and can facilitate the whole mobile learning process with ease opposite to that of bags full of registers and books.
- Using a stylus pen for writing is easier as compared to using keyboards & mouse.
- Mobile devices can be used at any place and anytime. They can be accessed even while traveling.
- Using mobile devices for learning purposes via applications and games is engaging.
- Mobile devices are economical as they are much cheaper as compared to computers.
- The size, shape, weight, and portability of mobile devices have made them extremely effective for users with permanent or temporary disabilities.
- SMS service can be used to quickly communicate with classmates or teachers at any time.

## **2.9 Disadvantages of M-Learning:**

Although mobile learning has lots of benefits but there are certain disadvantages as well. Some of them are as follows:

- The storage capacity of ordinary mobile devices is limited.
- Battery discharging is one of the crucial issue with mobile learning as these devices needed to be charged again and again.
- Complex projects like graphics are difficult to be done.
- Small screen size can become an issue. Eyes are also strained while using such small screens as compared to that of desktops.
- Very fast technological advancements is causing these devices to outdate fast
- To access content online, internet service is required mobile learning depends on availability of internet service in the region.

## 2.10 Theoretical Background

Technology Acceptance Model (TAM) is one of the renowned model related to the acceptance of technologies which was originally proposed by Davis in 1986. “The concept of TAM is to provide a theoretical basis to describe behavioural intentions attitude toward use, external variables impact, internal beliefs and the usage of actual system” (Legris, Ingham, & Collerette, 2003). “TAM is proposed to be a model of user acceptance of information technology” (Davis, Bagozzi, and Warshaw 1989). “TAM hypothesizes that two influencing factors (perceived ease of use and perceived usefulness) are the key factors leading to user acceptance of information technology” (Zhao & Zhu, 2010). “TAM also proposed that external factors affect actual and intention use through mediated effects on perceived ease of use and perceived usefulness” (Davis, 1989). According to TAM, ease of use and perceived usefulness are most important determinants of actual system use.

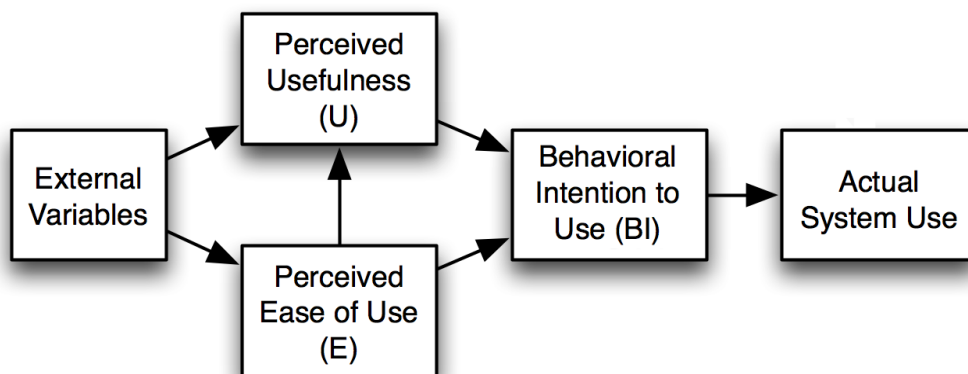


Fig. 2.2 TAM Model

These two factors are influenced by external variables. There can be various factors which influence these two factors. Following are the factors taken for the study:

Ease of use:

It refers to the degree to which prospective user expects that using a particular service would be effortless. (Davis, 1989). The proposed model considers the influence of perceived ease of use in respect of two external variables including



convenience of using mobile devices in learning (Economides & Nikolaou, 2008) and Interaction use of mobile devices (Claudia, 2013).

Convenience:

It refers to the accessibility and comfort felt while using mobile devices, tablets, I-pads etc. for the learning purposes. Mobile devices are portable and hence they can be easily carried and used at any place. Using mobile devices is also much more convenient as compared to personal computers or laptops as they are smaller in sizes. Storing and handling of mobile devices is also very convenient as compared to personal computers and laptops (Economides & Nikolaou, 2008).

Interaction:

It refers to the degree of interaction and collaboration which can be achieved while mobile devices. Mobile devices can help in interacting with people who are sitting at faraway places. It can help in interacting with fellow students or teachers as well. Mobile devices can also support in group studying. Sharing of information is also very easy and allows interaction between the students. (Claudia, 2013).

Usefulness:

Usefulness was found to have significant impacts on the willingness to adopt any technology (Chau, 1996). In M-learning perceived usefulness is defined as “the learners’ perception that using a particular system would enhance their performance and will be useful to meet some future goal” (Cole, Bergin, & Whittaker, 2008). The proposed model considers the influence of two external variables of perceived usefulness which are enjoyment and affordability.

Enjoyment:

It refers to the pleasure that is felt while using mobile devices, tablets, I-pads etc. for the learning purposes. Using mobile devices can be pleasing as it can help in gaining information from various entertaining methods like Educational Games. The content can be available in multiple formats like text, audio or video which can develop high interest amongst the learners. (Huang, Hsiao, Tang & Lien, 2014).

### Affordability:

It refers to the degree of cost-effectiveness of using mobile devices, tablets, I-pads etc. for the learning purposes. There is lot of free information available over the internet which can be accessed using mobile devices. The smartphones and tablets are also now available at much cheaper prices than before which gives economic advantage for using mobile learning platform. (Andreea, 2011).

## CHAPTER III

### 3. Research Methodology

Research is usually known to be a quest for knowledge. Research is an art of searching scientifically for particular information. According to Clifford Woody, “research comprises defining and redefining problems, formulating hypothesis or suggested solutions, collecting, organizing and evaluating data, making deductions and reaching conclusion and further testing the conclusion whether they fit into formulating hypothesis.” Research Methodology is a systematic & scientific method of finding problem to a solution. In this various research and statistical techniques like mean, mode, median, frequency distribution, standard deviation, regression and T-test are used to analyse the collected data.

#### 3.1 Research Design -

This research study is descriptive research as it identifies the factors enabling the willing to adopt mobile learning platform. Research design is the arrangement, structure, and methodology of examination imagined in order to get answers to research questions.

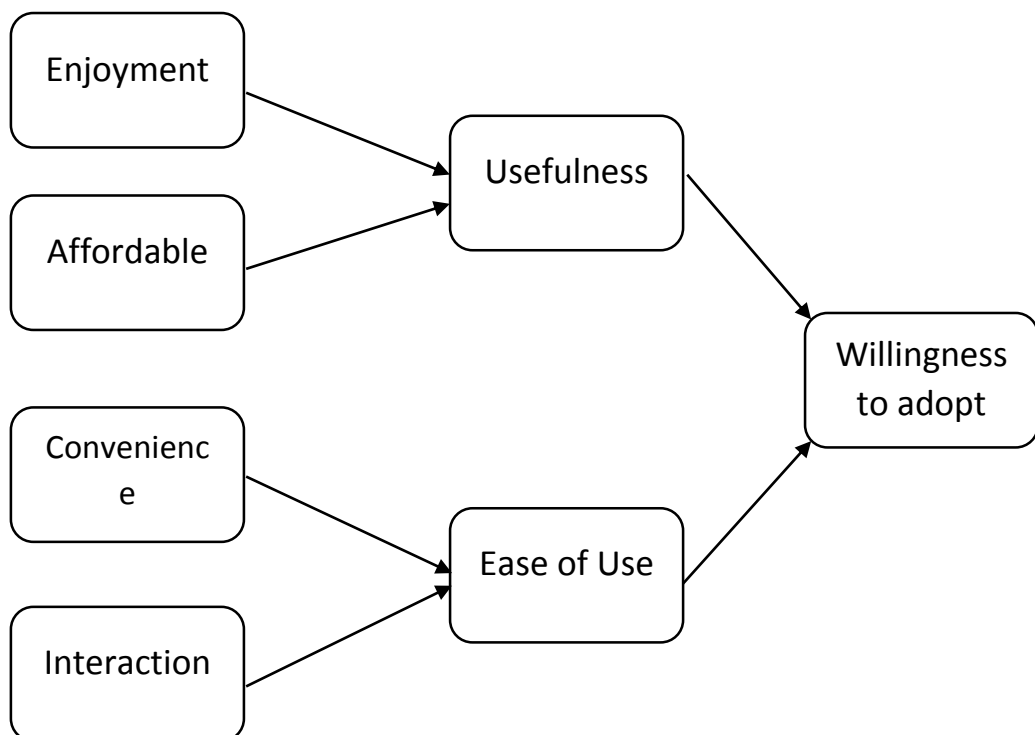


Fig. 3.1: Conceptual Model of the Study

### 3.2 Research Method

The questionnaire for the survey comprises of two sections. First section is for collecting the demographic details of the individuals filling the questionnaire. It include information related to their gender, occupation and income. Information has also been collected about their usage of mobile devices for learning purpose. The second segment includes questions on the basis of the different factors which have been identified from previous available literature. However some of the factors were altered to match the Indian context. 26 estimation items were acquired with respect to the measurements to be investigated. The rundown of things were additionally refined with the assistance of specialists relating to the field of study. The survey was further pre-tried on students pursuing higher education and employees knowing about mobile learning.

**Table 3.1:** Factors and Items

<b>FACTORS</b>	<b>ITEMS</b>
<b>Convenience</b>	<b>X1:</b> Using mobile devices for learning is easy
	<b>X2:</b> I possess knowledge to use mobile devices
	<b>X3:</b> Using mobile devices for learning requires training
	<b>X4:</b> Ordinary memory storage capacity is enough
	<b>X5:</b> Average screen size is appropriate
<b>Source -</b> (Economides & Nikolaou, 2008)	
<b>Interaction</b>	<b>X6:</b> Enables one to one Learning
	<b>X7:</b> Enables learning in groups
	<b>X8:</b> Peer evaluation can be done easily
	<b>X9:</b> Interface design are user friendly
<b>Source:</b> Claudia, 2013	
<b>Enjoyment</b>	<b>X10:</b> I feel satisfied while learning through mobile device
	<b>X11:</b> Learning through mobile device is engaging

	<b>X12:</b> Educational Applications are interesting
	<b>X13:</b> Learning using a mobile device is not boring
<b>Source:</b> Huang, Hsiao, Tang & Lien, 2014	
<b>Affordability</b>	<b>X14:</b> Access to mobile learning services is economical.
	<b>X15:</b> Internet service fee is affordable
	<b>X16:</b> Learning materials are economical
	<b>X17:</b> Learning contents can be used again
<b>Source:</b> Andreea, 2011	
<b>Usefulness</b>	<b>X18:</b> Provide access to huge amount of information
	<b>X19:</b> Latest information can be accessed
	<b>X20:</b> Retention of information is more
<b>Source:</b> Davis, 1989	
<b>Ease of use</b>	<b>X21:</b> Mobile devices can be used for learning at any place.
	<b>X22:</b> Mobile devices can be used for learning at any time.
	<b>X23:</b> Sharing of learning materials is easy
	<b>X24:</b> Learning content is available in multiple formats
	<b>X25:</b> Learning contents are compatible with different mobile operating systems
<b>Source:</b> Davis, 1989	
<b>Willingness</b>	<b>X26:</b> Willing to adopt M-learning
<b>Source:</b> Sarrab, 2016	

### **3.3 SOURCE OF DATA**

#### **Primary data**

Primary data are those which are newly gathered and which could be unique in character. There are many ways of collecting data, specifically for descriptive research. It includes methods such as observing method, interviewing method and collecting of data through questionnaires. For this research the data has been collected from students and working professionals through organized questionnaires (Individual sample units). Questionnaire is an arrangement of questions concentrated on a particular subject or specific field. The questionnaire can be parted into different subsets depending on the subtopics of specialized field. This technique is usually opted by researchers, private and public organizations, as well as government organizations also. In this technique, generally a questionnaire is sent to a respondent with a request to take the survey and then return back the questionnaire. The respondents are supposed to fill the questions by themselves. Presently, as we are in an age of IT the method of gathering the data by sending the questionnaires via Emails is most commonly utilized in various economic and business surveys.

#### **Secondary data**

Secondary data acts as a very powerful tool for any researcher as the entire research work is completed on the basis of secondary data. Secondary data is the foundation of any research work. Secondary data is the one which has already been gathered and analysed by some other researcher. Generally this analysed data is accessible in the published form. Secondary data has been gathered from the different research papers and different websites.

### **3.4 SAMPLING METHOD**

The populace includes male and female respondents of MBA universities, working professionals at different companies with the criteria that they have used mobile devices for learning purposes. For the research convenience sampling is taken into account.

In convenience sampling, a specimen is acquired by choosing required populace components from the given populace.

## **Sample Size**

The questionnaire was sent to 180 different persons out of which 150 responses have been taken into consideration for the research.

## **Data collection method**

Self-directed Personal study strategy was utilized to collect the responses. Proper questionnaires were outlined for the purpose. The questionnaire was forwarded through different online mediums including WhatsApp, Gmail and Facebook.

## **Data collection instrument:**

Fittingly planned questionnaires to encourage self-directed studies with basic standard inquiries were utilized to gather information.

## **Structure of Questionnaire:**

The questions defined were organized and non-camouflaged. The questions were designed in such a way to get all the fundamental data and to see that the respondents could answer them with ease. This pattern helped in dissecting the information.

## **Types of questions asked:**

### **1. Dichotomous questions**

This sort of question is of "Yes" or "No" structure. There are just two selections of answers and the respondent needs to pick either "Yes" or 'No'.

### **2. Likert Questions**

Likert questions help to ascertain how strongly the respondents agree or disagree to a specific statement. Such type of questions also help to assess how individuals feel towards a certain issue, product or service. Interval scale has been used for the research work. Interval scales are numeric scales in which we know not only the order, but also the exact differences between the values.

### **3.5 Tools and tests used**

For this research data analysis tools such as advanced Excel and the SPSS have been used to analyse the data. Data has been collected, segregated and then consolidated with Microsoft Excel. Then simple analysis in terms of percentage is also calculated with Microsoft Excel. SPSS has been used for the further analysis of collected data. Various techniques like frequency distribution, Regression and T-Test have been used. Data was firstly compiled in Excel and then this data was imported from Excel to SPSS. After importing the data, variables were declared first in SPSS. Hypothesis was tested with the level of significance which is generated by output through the above mentioned techniques.

The Statistical analysis was thus done in following two phases:

1. Application of statistical software tools such as Microsoft Excel 2013 and SPSS 22.0.
2. Interpretation and Conclusion.

### **Regression Analysis**

Regression is a factual measure used to decide the quality of the connection between one dependent variable (more often than not meant by Y) and a progression of other evolving factors (known as independent factors).

The two fundamental sorts of regression are linear regression and multiple linear regression, despite the fact that there are non-linear regression techniques for more confounded information and analysis. Linear regression utilizes one independent variable to clarify or anticipate the result of the reliant variable Y, while multiple regression utilizes at least two independent variables to foresee the result.

The general form of each type of regression is:

Linear Regression:  $Y = a + bX + u$

Multiple Regression:  $Y = a + b_1X_1 + b_2X_2 + b_3X_3 + \dots + b_tX_t + u$



Where:

Y = the variable that you are trying to predict (dependent variable)

X = the variable that you are using to predict Y (independent variable)

a = the intercept

b = the slope

u = the regression residual

Regression takes a gathering of arbitrary variables, that are able to anticipate Y, and tries to locate a numerical connection between them. This relationship is commonly as a straight line (linear regression) that best approximates all the individual information points. In multiple regression, the different variables are separated by utilizing numbers with subscript.

In this dissertation Linear Regression Analysis have been used.

### **T-test**

A t-test is an examination of two populaces' methods using factual examination; a t-test with two specimens is ordinarily utilized with little sample sizes, testing the distinction between the samples when the fluctuations of two ordinary appropriations are not known.

A t-test takes a gander at the t-statistic, the t-dispersion and degrees of freedom to decide the likelihood of contrast between populaces; the test measurement in the test is known as the t-statistic.

In this dissertation Independent Samples T-test have been used.

The independent samples t-test is utilized when two separate arrangements of autonomous and indistinguishably dispersed examples are acquired, one from each of the two populaces being looked at.

## CHAPTER IV

### 4. DATA ANALYSIS

#### 4.1 Introduction

This chapter deals with the analysis of the data that has been obtained. This research has been done to analyse the factors enabling the willingness to adopt mobile learning. The data have been collected with the help of questionnaire. Data was obtained in two different segments. In the first segment the demographic information was obtained like gender, age, occupation and income. Total 150 responses have been considered for analysis.

Out of the 150 responses 109 were obtained by males, while 41 responses were obtained by females.

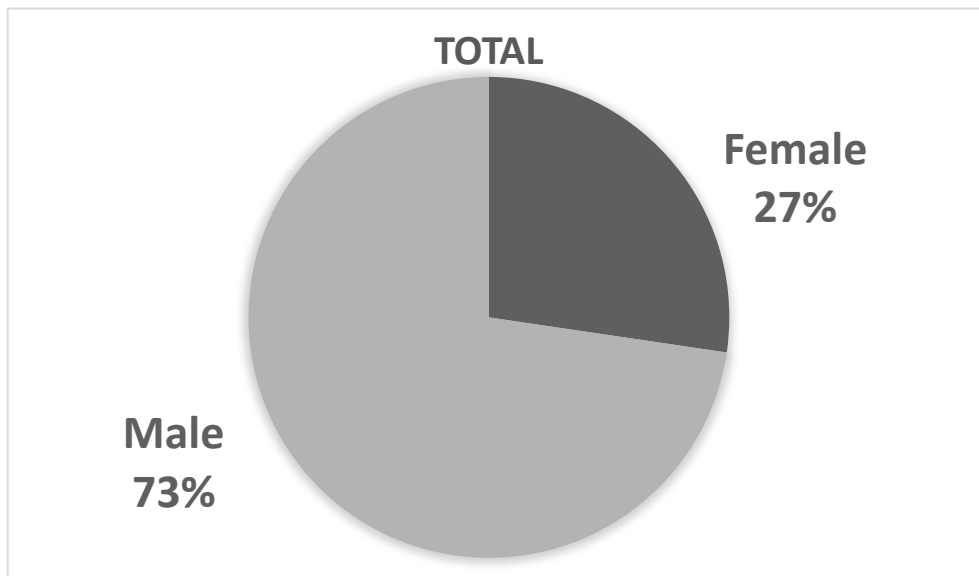


Fig 4.1 Gender Ratio chart

Out of the 150 responses the minimum age person from which data was obtained was 16 years. The maximum age person from which data was obtained was of 31 years. While the mean age of the sample was 25 years with a count of 35 responses.

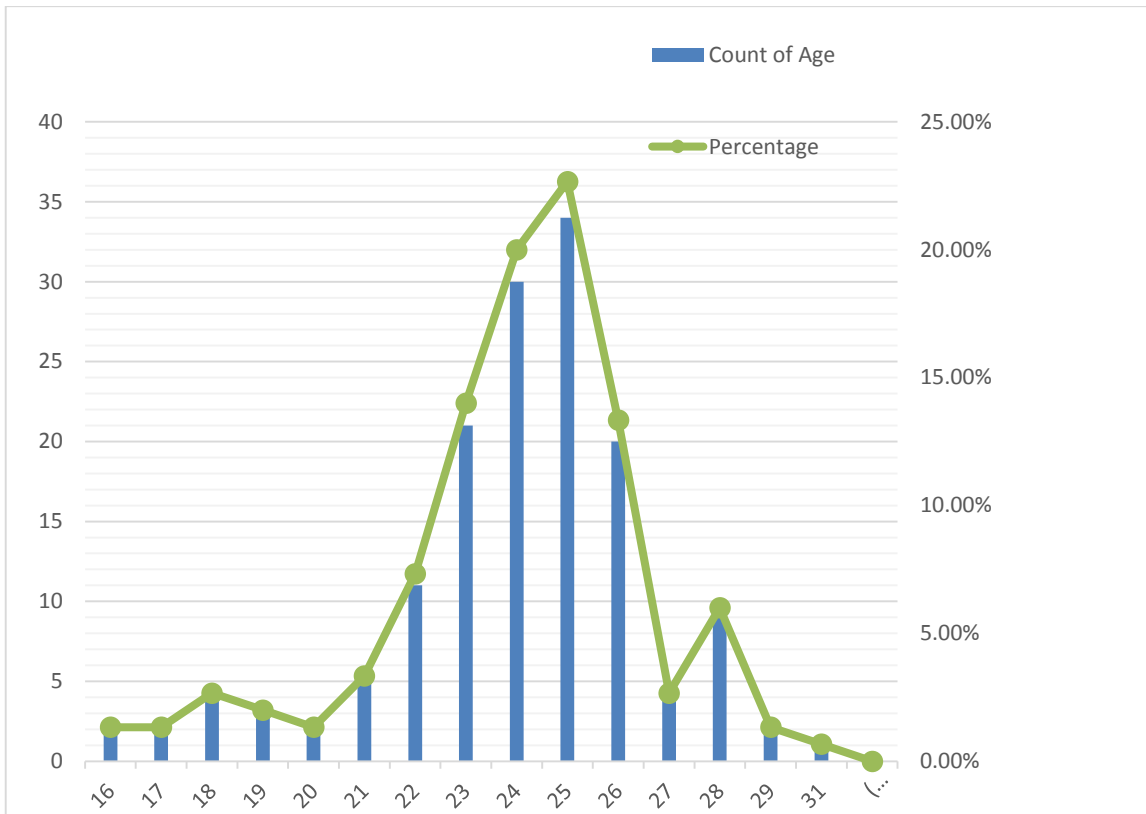


Fig. 4.2 Age group graph

The occupation of the sample was also noted. Out of 150 responses obtained there were 126 students, 23 working professionals and 1 self-employed respondents. Since self-employed respondents were negligible therefore for analysis self-employed and working were clubbed together.

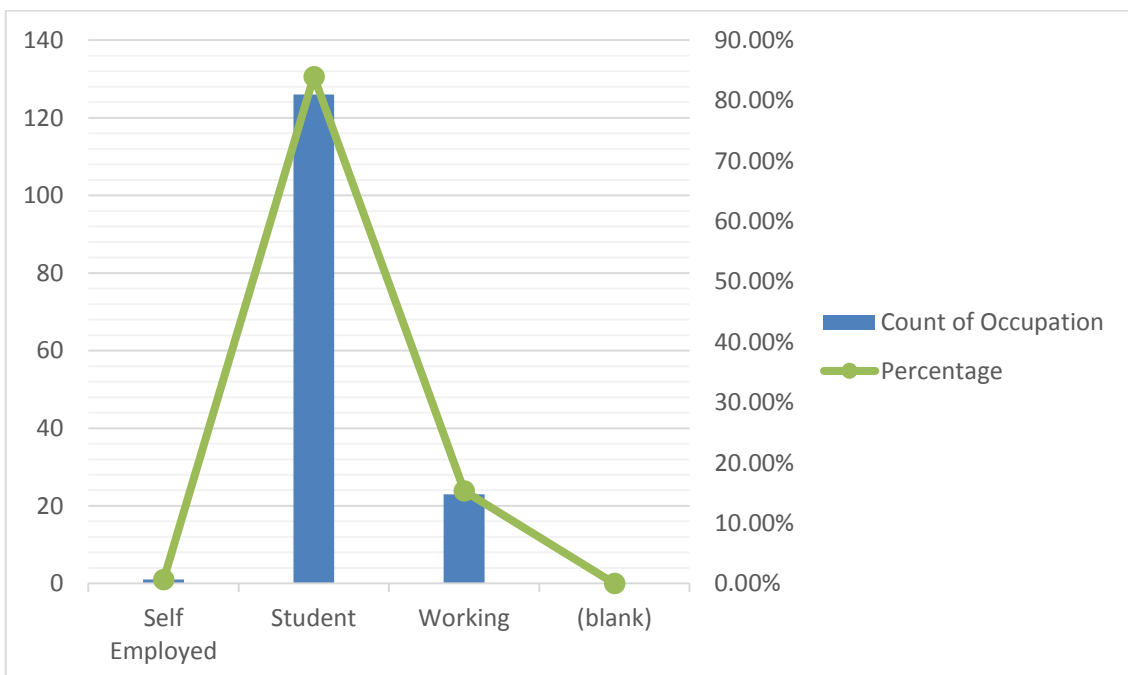


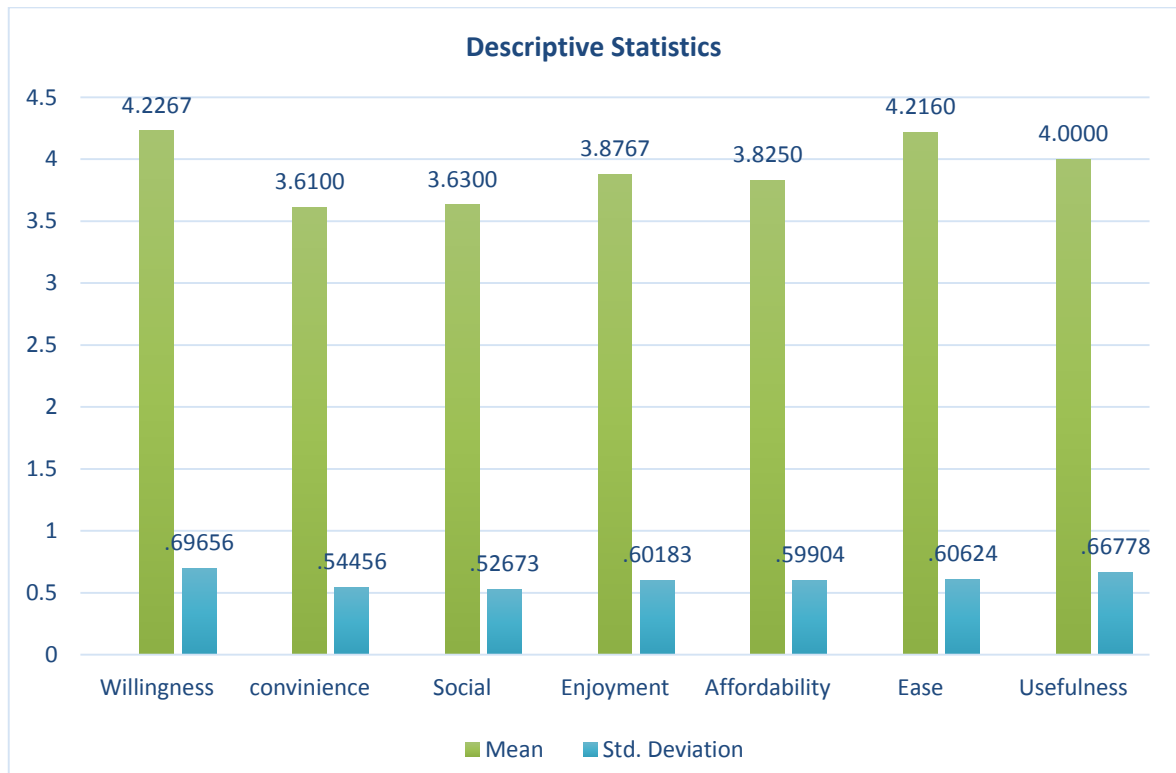
Fig. 4.3 Occupation of respondents

## 4.2 Descriptive analysis

All the 26 items were computed under 6 different variables which are convenience, Interaction, enjoyment, affordability, ease of use and usability. Descriptive analysis was done on these variables and their mean and standard deviation were calculated. The table of the analysis is as follows.

**Table 4.1** Descriptive statistics

	N	Mean	Std. Deviation
Willingness	150	4.2267	0.69656
Convenience	150	3.61	0.54456
Interaction	150	3.63	0.52673
Enjoyment	150	3.8767	0.60183
Affordability	150	3.825	0.59904
Ease	150	4.216	0.60624
Usefulness	150	4	0.66778
Valid (listwise)	N 150		



**Fig. 4.4** Descriptive statistics

### 4.3 Inferential Analysis

Regression analysis have been done on the variables. Regression analysis has been done 3 times. In first step enjoyment and affordability are kept as independent variable, while Usefulness is kept as dependent variable. In second step Convenience and Interaction are kept as independent variable, while Ease of use is kept as dependent variable. In last step Usefulness and Ease of use are kept as independent variable, while Willingness to adopt is kept as dependent variable.

#### Regression 1:

Null Hypothesis ( $H_0$ ): There is no significant relationship between Enjoyment and Affordability with respect to Usefulness.

Alternate Hypothesis ( $H_1$ ): There is significant relationship between Enjoyment and Affordability with respect to Usefulness.

**Table 4.1: Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.437 <sup>a</sup>	.191	.180	.60477	.191	17.333	2	147	.000

a. Predictors: (Constant), Affordability, Enjoyment

b. Dependent Variable: Usefulness

**Table 4.2: ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12.679	2	6.340	17.333	.000 <sup>b</sup>
	Residual	53.765	147	.366		
	Total	66.444	149			

a. Dependent Variable: Usefulness

b. Predictors: (Constant), Affordability, Enjoyment

**Table 4.3: Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.702	.393		4.328	.000
	Enjoyment	.301	.087	.271	3.455	.001
	Affordability	.296	.087	.265	3.381	.001

a. Dependent Variable: Usefulness

**Inference:**

The P-value is less than 0.05 and hence the factors are significant. Therefore the alternative hypothesis is accepted that there is significant relationship between Enjoyment and Affordability with respect to Usefulness. The beta coefficient of the model came out to be (enjoyment, .27), (affordability, .26) which signifies that strength of relationship between these factors with usefulness is more or less same.

**Regression 2:**

Null Hypothesis ( $H_0$ ): There is no significant relationship between Convenience and Interaction with respect to Ease of Use.

Alternate Hypothesis ( $H_1$ ): There is significant relationship between Convenience and Interaction with respect to Ease of Use.

**Table 4.4: Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. Change
1	.489 <sup>a</sup>	.239	.229	.53239	.239	23.102	2	147	.000

a. Predictors: (Constant), Interaction, convenience

b. Dependent Variable: Ease

**Table 4.5: ANOVA<sup>a</sup>**

Model		Sum Squares	df	Mean Square	F	Sig.
1	Regression	13.096	2	6.548	23.102	.000 <sup>b</sup>
	Residual	41.665	147	.283		
	Total	54.762	149			

a. Dependent Variable: Ease

b. Predictors: (Constant), Interaction, convenience

**Table 4.6: Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.773	.362		4.896	.000
	convenience	.332	.085	.301	3.887	.000
	Interaction	.343	.088	.298	3.886	.000

a. Dependent Variable: Ease

### **Inference:**

The P-value is less than 0.05 and hence the factors are significant. Therefore the alternative hypothesis is accepted that there is significant relationship between Convenience and Interaction with respect to Ease of Use. The beta coefficient of the model came out to be (convenience, .30), (interaction, .29) which signifies that strength of relationship between these factors with ease of use is more or less same.

### **Regression 3:**

Null Hypothesis (H<sub>0</sub>): There is no significant relationship between Ease of use and Usefulness with respect to Willingness to adopt.

Alternate Hypothesis ( $H_1$ ): There is significant relationship between Ease of use and Usefulness with respect to Willingness to adopt.

**Table 4.7: Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.602 <sup>a</sup>	.362	.353	.56013	.362	41.709	2	147	.000

a. Predictors: (Constant), Ease, Usefulness

b. Dependent Variable: Willingness

**Table 4.8: ANOVA<sup>a</sup>**

Model		Sum Squares	df	Mean Square	F	Sig.
1	Regression	26.172	2	13.086	41.709	.000 <sup>b</sup>
	Residual	46.121	147	.314		
	Total	72.293	149			

a. Dependent Variable: Willingness

b. Predictors: (Constant), Ease, Usefulness

**Table 4.9: Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.141	.342		3.333	.001
	Usefulness	.190	.083	.182	2.283	.024
	Ease	.552	.092	.480	6.027	.000

a. Dependent Variable: Willingness



**Inference:**

The P-value is less than 0.05 and hence the values are significant. Therefore the alternative hypothesis is accepted that there is significant relationship between Ease of use and Usefulness with respect to Willingness to adopt. The beta coefficient of the model came out to be (usefulness, .18), (ease, .48) which signifies that strength of relationship between these factors with willingness to adopt is different. Ease of use is a better enabler of willingness to adopt as compared to usefulness.

**T-Test**

Null Hypothesis (H0): There is no gender difference with respect to willingness to adopt.

Alternative Hypothesis (H1): There is gender difference with respect to willingness to adopt.

**Table 4.10:** Independent T test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Willingness	Equal variances assumed	1.297	.257	1.397	148	.165	.17767	.12721	-.07371	.42905
	Equal variances not assumed			1.436	76.146	.155	.17767	.12371	-.06870	.42404

**Table 4.11:** Group statistics

Group Statistics					
Gender		N	Mean	Std. Deviation	Std. Error Mean
Willingness	Male	109	4.2752	.70542	.06757
	Female	41	4.0976	.66351	.10362

**Inference:**

The P-value comes out to be more than 0.05. Hence, the null hypothesis is accepted. Therefore, it can be said that there is no significant gender difference with respect to willingness to adopting. The mean value of both the gender comes out to be nearly same.

**T-Test**

Null Hypothesis ( $H_0$ ): There is no difference between students and working professionals with respect to willingness to adopting.

Alternative Hypothesis ( $H_1$ ): There is difference between students and working professionals with respect to willingness to adopting.

**Table 4.12:** Independent T test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Willingness	Equal variances assumed	.104	.747	-.498	148	.620	-.07738	.15553	-.38472	.22996
	Equal variances not assumed			-.544	35.385	.590	-.07738	.14228	-.36610	.21134

**Table 4.13:** Group statistics

<b>Group Statistics</b>					
Occupation		N	Mean	Std. Deviation	Std. Error Mean
Willingness	Student	126	4.2143	.71114	.06335
	Working	24	4.2917	.62409	.12739

**Inference:**

The P-value comes out to be more than 0.05. Hence, the null hypothesis is accepted. Therefore, it can be said that there is no significant difference between students and working professionals with respect to willingness to adopting. The mean value for both students and working professionals comes out to be almost same.

#### 4.4 Findings:

- It was observed in the sample that almost everyone has once used mobile devices for learning purposes.
- It was observed that both students and working professionals are using mobile devices for learning purposes.
- It was observed that mostly respondents fall in medium usage category, which is 0 to 2 hours per day usage of mobile devices for learning purposes.
- It was found in regression 1 that there is a significant relationship between Enjoyment and Affordability with respect to Usefulness.
- It was found in regression 2 that there is a significant relationship between Convenience and Interaction with respect to Ease of use.
- It was found in regression 3 there is a significant relationship between Ease of use and Usefulness with respect to Willingness to adopt.
- It was found that as compared to Usefulness, Ease of use is a better enabler of willingness to adopt mobile devices for learning.
- In T-Test it was found that there is no significant gender difference with respect to willingness to adopt.
- In T-Test it was also found that there is no significant difference between students and working professionals with respect to willingness to adopt.

#### **4.5 Conclusion:**

Mobile learning is one of the latest advancements in technology which is gaining popularity day by day. It is gaining so much popularity because of the fact that it uses mobile platform. The accessibility of mobile devices like smartphones, tablets, I-pads, personal digital assistants, E-readers etc. has increased drastically which is the main reason for mobile learning's popularity. Apart from having access to smart gadgets, there are various other factors which affect the willingness of any individual to adopt m-learning.

Perceived ease of use and perceived usefulness are the two important factors which are found in literature that affect the new technology acceptance. The technology acceptance model was developed by Davis in 1989. These two factors have been analysed in this research to understand the willingness to adopt. Other external variables which have been considered are enjoyment, affordability, convenience and Interaction. A questionnaire was prepared on the basis of these variables and data was collected. A total data of 150 respondents was taken into consideration for the analysis. In the analysis it was found ease of use and usefulness are the factors which enables the willingness of an individual to adopt the mobile learning but the strength of both the factors varies. Ease of use is more significant to enable the willingness to adopt as compared to usefulness. Hence, ease of use is must for a user to make him adopt the mobile learning system.

#### **4.6 Recommendations:**

From the research it was found that usefulness and ease of use are two main variables on which willingness of adopting mobile learning depends. Both of them are significant factors but it can be recommended that for developing a system of mobile learning, Ease of use should always be there as it more significant enabler of willingness to adopt. Usefulness is also another of the significant factor but its strength is lesser as compared to that of Ease of use.

#### **4.7 Limitations:**

- The responses received for this research are 150 which is a small number therefore generalization is difficult.
- The sample included the responses from the age group of 16-31, therefore it is difficult to comment upon the factors enabling the willingness to adopt in other age groups.
- The variables taken for the research are less and there can be other factors as well which affect the willingness for adopting mobile devices for learning purposes. Tam model can also be extended to identify some more enabling factors of willingness to adopt mobile devices for learning.

## 5. Bibliography:

Accenture, C. (2011). GSMA (2011). *Smart Mobile Cities: Opportunities for Mobile Operators to Deliver Intelligent Cities*.

Agrawal, V., Agrawal, V., Agrawal, A., Agrawal, A., Agarwal, S., & Agarwal, S. (2016). Assessment of factors for e-learning: an empirical investigation. *Industrial and Commercial Training, 48*(8), 409-415.

Almasri, A. K. M. (2014). The influence on mobile learning based on technology acceptance model (TAM), mobile readiness (MR) and perceived interaction (PI) for higher education students. *International Journal of Technical Research and Applications, 2* (1), 5-11.

Awidi, I. T., & Cooper, M. (2015). Using management procedure gaps to enhance e-learning implementation in Africa. *Computers & Education, 90*, 64-79.

Cantoni, V., Cellario, M., & Porta, M. (2004). Perspectives and challenges in e-learning: towards natural interaction paradigms. *Journal of Visual Languages & Computing, 15*(5), 333-345.

Chao, H. C., Lai, C. F., Chen, S. Y., & Huang, Y. M. (2014). A M-learning content recommendation service by exploiting mobile social interactions. *IEEE Transactions on Learning Technologies, 7*(3), 221-230.

Chiu, C. M., & Wang, E. T. (2008). Understanding Web-based learning continuance intention: The role of subjective task value. *Information & Management, 45*(3), 194-201.

Chiu, C. M., Sun, S. Y., Sun, P. C., & Ju, T. L. (2007). An empirical analysis of the antecedents of web-based learning continuance. *Computers & Education, 49*(4), 1224-1245.

Ciampa, K. (2014). Learning in a mobile age: an investigation of student motivation. *Journal of Computer Assisted Learning, 30*(1), 82-96.

Cole, J. S., Bergin, D. A., & Whittaker, T. A. (2008). Predicting student achievement for low stakes tests with effort and task value. *Contemporary Educational Psychology, 33*(4), 609–624

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science, 35*(8), 982–1003.

Davis, F.D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319-340.

Eccles, J. S., & Wigfield, A. (2002). Motivational beliefs, values, and goals. *Annual review of psychology, 53*(1), 109-132.

- Economides, A. A., & Nikolaou, N. (2008). Evaluation of handheld devices for mobile learning. *International Journal of Engineering Education*, 24(1), 3.
- Huang, J. H., Lin, Y. R., & Chuang, S. T. (2007). Elucidating user behavior of mobile learning: A perspective of the extended technology acceptance model. *The Electronic Library*, 25(5), 585-598.
- Huang, R. T., Hsiao, C. H., Tang, T. W., & Lien, T. C. (2014). Exploring the moderating role of perceived flexibility advantages in mobile learning continuance intention (MLCI). *The International Review of Research in Open and Distributed Learning*, 15(3).
- Legris, P., Ingham, J., & Collette, P. (2003). Why do people use information technology? A critical review of the technology acceptance model. *Information & management*, 40(3), 191-204.
- Li, Y., Qi, J., & Shu, H. (2008). Review of relationships among variables in TAM. *Tsinghua Science & Technology*, 13(3), 273-278.
- Liu, Y., & Chen, N. S. (2008, July). An adoption model for mobile learning. In *Proceeding for the IADIS International Conference e-Commerce*.
- Liu, Y., Han, S., & Li, H. (2010). Understanding the factors driving m-learning adoption: a literature review. *Campus-Wide Information Systems*, 27(4), 210-226.
- Martin, F., & Ertzberger, J. (2013). Here and now mobile learning: An experimental study on the use of mobile technology. *Computers & Education*, 68, 76-85.
- Mehdipour, Y., & Hamideh, Z. (2013). Mobile learning for education: Benefits and challenges. *International Journal of Computational Engineering Research*, 3(6), 93-101.
- Monahan, T., McArdle, G., & Bertolotto, M. (2008). Virtual reality for collaborative e-learning. *Computers & Education*, 50(4), 1339-1353.
- Molnar, A., & Muntean, C. H. (2012). Mobile learning: An economic approach. In *Intelligent and adaptive learning systems: Technology enhanced support for learners and teachers* (pp. 311-326). IGI Global.
- Moore, J. L., Dickson-Deane, C., & Galyen, K. (2011). e-Learning, online learning, and distance learning environments: Are they the same?. *The Internet and Higher Education*, 14(2), 129-135.
- Sørebø, Ø., Halvari, H., Gulli, V. F., & Kristiansen, R. (2009). The role of self-determination theory in explaining teachers' motivation to continue to use e-learning technology. *Computers & Education*, 53(4), 1177-1187.
- Park, S. Y., Nam, M. W., & Cha, S. B. (2012). University students' behavioral intention to use mobile learning: Evaluating the technology acceptance model. *British Journal of Educational Technology*, 43(4), 592-605.



- Park, Y. (2011). A pedagogical framework for mobile learning: Categorizing educational applications of mobile technologies into four types. *The International Review of Research in Open and Distributed Learning*, 12(2), 78-102.
- Romani, V. (2009). The politics of higher education in the Middle East: Problems and prospects. *Middle East Brief*, 36(1), 1-8.
- Sarrab, M., Al-Shih, H., & Rehman, O. M. H. (2013). Exploring major challenges and benefits of m-learning adoption. *British Journal of Applied Science & Technology*, 3(4), 826.
- Sarrab, M., Al Shibli, I., & Badursha, N. (2016). An Empirical Study of Factors Driving the Adoption of Mobile Learning in Omani Higher Education. *The International Review of Research in Open and Distributed Learning*, 17(4).
- Sarrab, M., & Elgamel, L. (2013). Contextual m-learning system for higher education providers in Oman. *World Applied Sciences Journal*, 22(10), 1412-1419.
- Sarrab, M., Alalwan, N., Alfarraj, O., & Alzahrani, A. (2015). An empirical study on cloud computing requirements for better mobile learning services. *International Journal of Mobile Learning and Organisation*, 9(1), 1-20.
- Sha, L., Looi, C. K., Chen, W., & Zhang, B. H. (2012). Understanding mobile learning from the perspective of self-regulated learning. *Journal of Computer Assisted Learning*, 28(4), 366-378.
- Sharples, M. (2006). Big issues in mobile learning. In *Report of a workshop by the Kaleidoscope Network of Excellence Mobile Learning Initiative* (pp. 1-37). Nottingham: LSRI, University of Nottingham.
- Sharples, E. M. (2007). Big Issues in Mobile Learning: Report of a workshop by the Kaleidoscope Network of Excellence.
- Sung, Y. T., Chang, K. E., & Liu, T. C. (2016). The effects of integrating mobile devices with teaching and learning on students' learning performance: A meta-analysis and research synthesis. *Computers & Education*, 94, 252-275.
- Tsai, P. S., Tsai, C. C., & Hwang, G. J. (2012). Developing a survey for assessing preferences in constructivist context-aware ubiquitous learning environments. *Journal of computer assisted learning*, 28(3), 250-264.
- Uzunboylu, H., & Ozdamli, F. (2011). Teacher perception for m-learning: scale development and teachers' perceptions. *Journal of Computer assisted learning*, 27(6), 544-556.

## 6. Annexure

### Questionnaire

Please specify your age (in years) \*

---

Please specify your gender \*

*Mark only one oval.*

- Male
- Female
- Prefer not to say

Please select occupation \*

*Mark only one oval.*

- Student
- Working
- Self Employed
- Other: \_\_\_\_\_

Please select your annual Household Income (in INR) \*

*Mark only one oval.*

- Less than 6,00,000
- 6,00,001 - 12,00,000
- Above 12,00,000

Do you have access to smartphone (mobile devices, tablets, I-pads) \*

*Mark only one oval.*

- Yes
- No

Have you used mobile devices for learning? \*

*Mark only one oval.*

- Yes
- No

How many hours in a day you spend for learning via mobile devices? \*

*Mark only one oval.*

- Nil
- 0-2
- More than 2

## Convenience of using mobile devices for learning

---

1. Using mobile devices for learning is easy \*

*Mark only one oval.*

	1	2	3	4	5	
Highly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Highly Agree

2. I possess knowledge to use mobile devices for learning \*

*Mark only one oval.*

	1	2	3	4	5	
Highly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Highly Agree

3. Using mobile devices for learning requires training \*

*Mark only one oval.*

	1	2	3	4	5	
Highly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Highly Agree

4. The ordinary memory storage capacity of mobile devices is good enough for learning \*

*Mark only one oval.*

	1	2	3	4	5	
Highly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Highly Agree

5. The average screen size of mobile devices is appropriate for learning \*

*Mark only one oval.*

	1	2	3	4	5	
Highly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Highly Agree

## Interaction and Collaboration learning using mobile devices

---

6. Mobile devices facilitates one to one Learning \*

*Mark only one oval.*

	1	2	3	4	5	
Highly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Highly Agree

7. Mobile devices facilitates learning in groups \*

Mark only one oval.

	1	2	3	4	5	
Highly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Highly Agree

8. Peer evaluation can be done easily and instantly \*

Mark only one oval.

	1	2	3	4	5	
Highly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Highly Agree

9. Interface design are user friendly. \*

Mark only one oval.

	1	2	3	4	5	
Highly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Highly Agree

## Enjoyment of using mobile devices for learning

---

10. I feel satisfied while learning through a mobile device \*

Mark only one oval.

	1	2	3	4	5	
Highly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Highly Agree

11. Learning using a mobile device engages me \*

Mark only one oval.

	1	2	3	4	5	
Highly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Highly Agree

12. Learning with the help of Educational Apps is interesting \*

Mark only one oval.

	1	2	3	4	5	
Highly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Highly Agree

13. Learning using a mobile device is not boring \*

Mark only one oval.

	1	2	3	4	5	
Highly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Highly Agree

## Affordability of learning using mobile devices

---

14. Access to mobile learning services is economical. \*

Mark only one oval.

	1	2	3	4	5	
Highly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Highly Agree

15. Internet subscription fee is manageable \*

Mark only one oval.

	1	2	3	4	5	
Highly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Highly Agree

16. Learning contents are economical (say E-book, discussion forums, online courses) \*

Mark only one oval.

	1	2	3	4	5	
Highly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Highly Agree

17. Learning contents can be used as many times as desired \*

Mark only one oval.

	1	2	3	4	5	
Highly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Highly Agree

## Usefulness of mobile devices for learning

---

18. A lot more information can be obtained by using mobile devices as compared to traditional learning methods \*

Mark only one oval.

	1	2	3	4	5	
Highly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Highly Agree

19. Updated information can be obtained by using mobile devices \*

Mark only one oval.

	1	2	3	4	5	
Highly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Highly Agree

20. Retention of information is more when obtained by mobile devices \*

Mark only one oval.

	1	2	3	4	5	
Highly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Highly Agree

## Ease of use of mobile devices for learning

---

21. Individual can use mobile devices for learning at any place. \*

Mark only one oval.

	1	2	3	4	5	
Highly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Highly Agree

22. Individual can use mobile devices for learning at any time. \*

Mark only one oval.

	1	2	3	4	5	
Highly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Highly Agree

23. Sharing of learning materials is easy on mobile devices. \*

Mark only one oval.

	1	2	3	4	5	
Highly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Highly Agree

24. Learning contents on mobile platform are in multiple formats (e.g.audio, video, and document) \*

Mark only one oval.

	1	2	3	4	5	
Highly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Highly Agree



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