Chapter: 1

Introduction
1 INTRODUCTION

Academia is undergoing change on all fronts including teaching and learning. Right from lecture delivery to continuous evaluation and laboratory work to writing exams, at all touch points, there are technology effects happening at various scales. E-Learning happens to be one such paradigm shift, slowly but surely taking over conventional modes of teaching and learning world-wide. At any given point in time, one cannot take out technology from teaching or learning completely. The pace of change happening in terms of new tools, applications, hardware and software for learning has been very high over the years. Financial pressures on academia, need felt by students to keep up with latest technologies, and fast vanishing boundaries world-wide making more resources open – are some of reasons for innovations happening in education technology space.
In many studies, researchers claim that since ICT use has made world economies more competitive and interdependent, knowledge creation and its use have become focal points for long-term development strategies. They also suggest that since ICT improves the standard of living, modernizes societies, promotes equity in education, enhances the quality of teaching and learning, and, with other technologies, is a force for change, a more diversified and flexible type of Higher Education Sector (HES) in which research, teaching, and social engagement remain rich, relevant, and accessible.

Developing countries like India are never before concerned with its education system owing to – Quality of Education delivered and its Relevance. With spectrum of learners as wide as – women, rural areas, low income groups – in India, technology may just be that potent weapon India can reply upon to achieve – reach and quality. Technology in education can also help learners, one of constituents of the system, acquire all important employability skills. While India reels under the global pressures like GER, Economic Growth, Labor skills in graduates, using technology as an enabler with immediate effect seems to be a mandate.

It is also well known that implementation of technology as an enabler in the education system is complex. Right from introducing the technology to advanced use of it, and anywhere in the world, technology implementation has been a research topic for many. Education settings, users, government policies, basic infrastructure availability, performance pressures, leadership – reasons galore. Moreover, it is just not implementation but even taking a first step of thinking about technology in education itself is not all that easy in many parts of the country.

The research in case has identified exact challenges faced by the higher education sector in adopting information and communication technologies or ICT. Though challenges may sound to be easy to list, researcher has taken efforts to identify
reasons from various stakeholders (owners, heads of institutions, professors, students) to bring a completeness in the outcome. Going beyond, the study also suggests ICT adoption model, very specific to higher education academia in India.

This chapter will cover the following – ICT Terminologies, Why ICT is necessary, Problem Statement, Objectives of Study, Outcome of Study, Limitations of Study.

1.1 ICT Terminologies

ICT or information and communications technologies is the term used to indicate information technologies, telephone network, technology infrastructure, digital form of content and communication channels. With technologies converging every day, whenever all or part of above is used in education sector, it is referred to as ICT in education. Such technologies are used to –

- Manage educational activities and tasks (automation)
- Facilitate content deliverable (platforms)
- Generate, share, deliver effective content
- Store and reuse educational systems
- Network with each other – peer or institution levels

ICT in education involves software as well as hardware aspects of technology. Simply putting all software and hardware together for any educational institution also can be referred to as ICT for education.

Typical software used in education may include –

- Enterprise solutions (ERP, LMS / LCMS, Portal)
- Middleware and storage
- Content
- Software tools

And typical hardware used in education under ICT include –

- Computers and computing devices
- Projectors, cameras, monitors, intelligent whiteboards and televisions
- Radios, audio devices
- Routers, Switches

Following are some more definitions that help in describing ICT in education –

Technologies like Computers, Internet, Broadcasting, Telephones – in all formats used along with Applications, Content and Software Tools – comprise of ICT in education

Electronic learning or e-learning is another parallel used for ICT, especially in higher education sector. E-learning is the teaching learning effected through appropriate use of digital technologies like – CDs, internet, learning management system, telecommunication network etc. Open learning, Blended learning are other popular terms used while referring to ICT in education.

E-Books, Virtual Learning Environment, Mobile Applications, Online Exams, Simulations, Gaming Applications, Analytics and Intelligence, Gesture-based Computing etc. are some more commonly used terms in Indian education sector when we talk about ICT.

ICT may simply refer to the technologies used in education sector to facilitate teaching learning process involving all stakeholders. But it was imperative to mention various terminologies (as above) used in describing ICT here since it helped in toning down the complexity about ICT in education.
1.2 ICT deployment

ICT that is required for the deployment in Higher Educational Institutions (HEIs) may be based on some of the infrastructure domains as mentioned below:

- **Technical infrastructure domain**: that consists of computers, equipment, cabling of network and other hardware which may be required to host applications beneficial and of utility to share and exchange information and data.

- **Applications infrastructure domain**: that consists of applications of ICT, software systems especially those used in HEIs for academic and curriculum learning and teaching methods, research, academic processes etc.

- **Knowledge infrastructure domain**: current ICT knowledge of all stakeholders especially those who are direct users such as institute staff (both faculty members, administrative staff) and students. Effective use of hardware and software determines the skill level of the students and staff at the institute. Of importance is the skill level of the technical staff of ICT who major role is in installation and maintenance of all systems and hardware.

- **Governance infrastructure domain**: which refers to guidelines, procedures, policies and management structure required to develop, run and maintain applications, and other ICT requirements.

1.3 ICT – in education

Knowing that education is the backbone of a nation, it plays a great role in development of any nation. We are all aware of the benefits of education and to economic development. Rather, modern economic development is an outcome of investments in education its people by nations. Understanding how education system
works and how it has evolved over so many decades now has been a significant research agenda in recent times.

With high expectations from the education sector, the following are some of the main tasks it performs:

1) It is a education provider both at basic and higher levels
2) It is a well known fact that educated persons have better opportunities of earning income;
3) There is transformation and change in the living standard of people and assists in social development.

Information, Knowledge, and Communication Technology plays important role in imparting education in current scenario. Information and Communications Technology (ICT) has had a profound impact in the way of imparting education in current times. Higher education in India has witnessed enormous growth especially after post-independence era. At the time of independence there were 117 universities and about 400 colleges in India. Contrast this to the current numbers; 520 universities, nearly 22,000 + colleges, over 10 million students, 0.45 million teachers. These figures depict India as one of the largest higher education provider in the world. The education system in India focuses on creation of good quality and well trained human capital that contributes positively to the needs of the Indian economy. Having said this, there are numerous operational challenges as well.

Economies and business need technologically literate persons (Grinager Hearthy 2006)2 and the demand for the same increases on a yearly basis. There is a great requirement of skilled employees and persons especially in terms of their understanding of use of technology tools. These technology tools include working knowledge of use of computers, networking, network technologies, audio - video, and

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1 UGC Annual Report 2011
other media and multimedia tools which enable teachers to disseminate knowledge in the entire teaching pedagogy.

According to the reports of EnGuage, the best use of teaching ICT in academia is to prepare students in its wide use and application. This relates to use of computers, the internet and related technologies. Knowledge of technology or technological literacy, and the skill to use ICTs effectively and efficiently, are seen to have important bearing and a competitive edge in an increasingly demanding global job market.

EnGauge, North Central Regional Educational Laboratory (U.S.) has identified what it calls “21st Century Skills,” which include digital age literacy (consisting of functional literacy, visual literacy, scientific literacy, technological literacy, information literacy, cultural literacy and global awareness), inventive thinking, high order thinking and sound reasoning, effective communication and high productivity. There is need to build the potential among academia to acquire such skills as there are of increasing demand globally. Moreover, concerns of raising quality of education, moving to academic orientation of teaching and research, skilling students need ICT in education.

The progress of any country depends upon the quality of education offered and practices (Khirwadkar). We are aware of the fact that our Indian education was appreciated for its Gurukul System of Education. Right from the beginning to current times, Education in India has undergone various phases and stages of development. The concern for quality in education is reflected through all stages of development. There are tremendous impact on the way teaching and learning are conducted in the current era. Traditionally, learning environments were restricted to face- to- face delivery or was largely characterized by the sending printed resources and communication that is seen in distance education. These modes had their own challenges.
The teacher’s role as an educator is transformed through integrating technology into teaching-learning transaction. It has been also pointed out through some studies that the students’ roles also change from being passive receivers of content to being more active participants and partners in the learning process (Aley, et al 1996). Studies have shown that the use of ICT in academia provides great potential and is of great advantage to students in enhancing their knowledge (Lopez (2003). To further reiterate this fact it is evident that :

(a) interactive learning experiences are enhanced and strengthened by communication technologies.

(b) It is a well known fact that learning through ICTs is more effective as they provide opportunities for using multiple technologies. The multiple technologies that may be used are in the form of Video based learning and interaction, Computer based simulations and all other tasks that can be performed with the help of Computer, Telecommunication systems, etc.). These modes offer a high degree of visualization and interaction in understanding of concepts, models and processes. Thus ICT assists in bridging the gap between theory and practical inputs much desired by learners.

(c) That there is a tremendous need for ICT skills among students. This is evident from the job demands as employers seek competencies in ICT skills. The availability of information required to support learning processes is possible through ICT for students. ICT has been of great help to students in all their academic conduct and work. The use of ICT in education can improve memory retention, increase motivation and generally deepen understanding (Dede 1998).

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3 Alley, 1996; Repp, 1996; Roblyer, Edwards and Havriluk, 1997
According to Selinger (2004), ICT and initiatives in ICT can improve the quality of education as interactivity and multimedia contents help demonstrate and simplify complex concepts which were difficult to understand by earlier traditional teaching resources and methodologies.

Through rigorous orientation to teaching and research process, Higher education plays a significant role and contributes to society and economy at large. The support to higher education stems from utilisation and adoption to Information and Communication Technology (ICT). As educational institutes conduct its academic processes, the role of ICT is pivotal in information management which is storage, retrieval, manipulation and transmission of data.

The functionality of ICT in educational institutes can be corroborated through the following:

(i) ease of communication and implementation of policies and decisions,
(ii) automation of tasks and processes that are long and routine
(iii) academic administration support
(iv) information gathering, mining and analysis

Since information is the crucial ingredient for all educational institutions, ICT plays a great role in information processing, converting it into useful knowledge and assist in its availability wherever and whenever. The role of Information and Communication Technologies (ICTs) in reducing costs has had tremendous impact in its usage. The aspect of ICTs in reducing cost in higher educational institutes is a well known fact. Currently, all educational institutes have realised the innumerable benefits of ICT especially the institutes providing full time education as educational institutes conducting distance education programmes have utilised ICT and received its benefits. Virtual learning is setting the stage of learning and Universities have far
transgressed beyond Brick-and-Mortar Campuses. In the reports of Becta\(^4\) (2004), Virtual learning offers: powerful communication tools; collaborative tools through the intranets and internet; creation of online courses and contents; integration with all other management systems prevalent in the academic institution; access to curriculum through control mechanisms. The potential to engage in entire teaching and research process is provided by Virtual Learning environments.

The benefits of Virtual Learning environments is through flexibility of anywhere anytime access (Jacobsen and Kramer 2000); increased role of students in self study (Russell 2000); better learning of ICT and knowledge based skills (Watts and Lloyd 2000); high involvement of students who may be passive who are encouraged to contribute more effectively (Tanner and Jones 2000); development of learning styles of a higher level and different and new approaches to learning (Gibbs 1999); fosters use of online academic sessions and seminars which encourages and increases participation and performance (Pilkington et al 2000); improves confidence among students through collaborative efforts (Selinger 1997).

As centers of knowledge creation, the higher education sector have transformed itself to different levels and structures to meet the challenges of a demanding economy and environment. Converting inputs into actionable outputs has the overriding goal of higher education institutes which is a time oriented set of inter-related process (Sepehri, 2004). These processes usually cut across organizational structures and boundaries. Thus traditional structures of higher education are being challenged to fit in the demands of the knowledge economy. Thus the role of ICT to create processes and deliver academically strengthened learning environments is highly needed. This results in enhancement of individual and organizational performance (Rosenberg, 2006). Thus it is vital to exploit the potential of Information and Communication Technology (ICT) to design, manage and to deliver courses and training modules.

\(^4\) Becta – British Educational Communications and Technology Agency. It is British government led agency for information and communications technology in education.
The term information and communication technology (ICT) encompasses all the computerized teaching systems, such as software tools (applications like MS office) and hardware tools like CD-ROM, as well as all the telecommunication systems, such as web and video conferencing. The use of ICT provides tremendous support to activities such as aspects of teaching and learning of courses’ their development, content presentation through high interactivity, administration support, student data, tests and assignment handling, even when the student community is far and dispersed.

Green S. A. (1996), states that educational standards maybe maintained and achieved through the pursuit of quality. This can be attained through setting specific expectations and requirements that should be complied with set goals with ideals of excellence. The definition of these expectations and ideals can differ from context to context, from institution to institution and is dependent on the specific aim pursued. Applying the principle of quality entails evaluating services and products against set standards, with a view to improvement, renewal or progress which is achieved through the implementation of ICT.

The reports of UNESCO\(^5\) (1998) states that “The rapid breakthroughs in new information and communication technologies will further change the way knowledge is developed, acquired and delivered. It is also important to note that the new technologies offer opportunities to innovate on course content and teaching methods and to widen access to higher learning”.

According to Roswall, Thomas (1999), ICT enhances Higher Education in a number of ways: It enables the effective storing/sorting of information, and can offer new fast ways of communication. It enables the reduction of information quantity towards a higher quality and better structure. It can be integrated into teaching and learning.

strategies and used to support relative learning theories; and ICT (computers, Inter and Intranet) can be used to create new types of interactive learning media for improved quality, equity, and access in Higher Education.

ICT enhances teaching and learning, and can be “integrated into teaching and learning strategies.

According to Haddad and Jurich Sonia (2002) improving the quality of education and training is a critical issue, particularly at a time of educational expansion. ICTs can enhance the quality of education in many ways:

- by increasing learner motivation and their engagement in the academic processes,
- by facilitating the acquisition and learning of basic skills, and
- by enhancing teacher development through their training.

There is need to provide challenging, engaging and original content through ICTs usage in the form of use of videos, multimedia for high interactivity, and software tools. ICT thus may be an enabler for engagement of students in the learning process.

### 1.4 Why ICT is necessary

**Reach**

MHRD’s mission of achieving GER of 20+% ⁶ in next few years will definitely require a technology push to take education to the corners of the country. Now that Indian infrastructure is progressing by leaps and bounds every passing day, using more advanced technologies to give access to the rural youth to the best education is

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⁶ UGC Annual Report 2011
very much on the anvil. MHRD’s National Mission on Education through ICT or NMEICT has suggested separate funding from the government for such activities separately.
Quality

- Use of ICT in teaching has proven that student comprehension has increased by more than double (#) while retention of knowledge has increased tremendously too. Student grades have increased to a great extent when interactive content is used by the teachers.
- ICT tools have also created a powerful monitor in academic research. Especially in Indian education sector, ICT can be a boon to researchers while deciding research topics or publishing research reports.
- ICT also helps in standardizing curricula and refine it based on the trends happening worldwide. Thanks to the internet and social media, Indian educators can benefit tremendously when it comes to enhancing program content.
- Research shows that the use of hardware and computers as tutors, instructional delivery, along with traditional instruction, results in increases in learning in the traditional curriculum and basic skills areas, as well as higher test scores in some subjects compared to conventional instruction alone. Students get to learn more quickly, demonstrate greater retention, and are better motivated to learn when they work with computers.

Globalization

Not only in case of academic research and specifically plagiarism, but even students need to access global knowledge to know more and progress more in their lives. Such knowledge access is possible through sharing and re-creating the knowledge. Such is the power of ICT, now students can spend more time studying theories at home and discuss practical applications in the class – in a typical flipped classroom environment. Such new pedagogies are more easy to implement once ICT reaches to the academia extensively.

Lowering Costs
Costs of technology acquisitions have been lowering every day. This is certainly heartening for budget makers and educators when it comes to budget allocations. Certainly another reason to consider ICT expense head. Moreover, with technology evolution, alternatives too are coming out in numbers. Be it hardware or software, such alternative technologies are useful from cost perspective for the academia.

**Learning and not teaching**

Building ‘learner centric’ education system is the need. For a country like India where one finds variety in the form of rural versus urban student, infrastructure, language etc., it becomes all that complex to understand student requirements and come up with a system that focuses on learners. Mass customization of education, to make it learner centric, one definitely needs to take help of the technology potential in terms of computing power, analysis and output generation capability.

**Inclusive Growth**

- Beyond a basic user competency, our society also needs more knowledgeable and capable technical people to deploy – industry or government sector. Every where we need people that are not only educated but also knowledgeable about required skills. Essentially we need a systm that will be pervasive and reaching out to a bigger span of the country.
- With diverse backgrounds of students in a country like India, ICT may just be a one stop solution to identify strong and weak areas of students, make them enrol and take up studies that is more suitable, be a part of the system and contribute to the society.

**1.5 Higher education and ICT challenges**

We have witnessed the exponential growth of higher education systems to meet demands of burgeoning job market and need for quality in education. The focus on
quality and other deliverables that have made it render to industry requirements and skill building, has gained momentum which is due to swift advancements in Information and Communication Technology (ICT). The burgeoning demand for skilled and competent workforce is on the rise. Thus, economic growth and development will be sustained through continued access to quality higher education for all. This determining factor of educational institutes depends on the utilisation of ICT in academia. Currently in India with all Government initiative and support, there is focus on increase to access to higher education and improving its reach to the remotest parts of the country. This is through ICT which is quite possible through reduced cost. The last two decades have witnessed the inclusion of developments in ICTs in higher education systems around the world. It may not be simple; hence it is a daunting challenge to develop a higher education system that is flexible and dynamic to integrate the technology in the management and delivery of learning programmes in academic institutions.

The application of ICT in higher education has revolutionized teaching and learning. Teacher trainees with diverse learning styles are able to maximize their learning potential when instructors use ICT to support their pedagogical practices. An important consequence of ICT is enabling the learners to be more independent, reflective and self-regulated in their learning process (Haq, 2012).

Markus Mostert (2009) states that internationally the way in which higher education (HE) is conceptualised is changing. Advent of globalisation, massification, shrinking resources, the proliferation of information and communication technologies (ICTs), increases demands for quality assurance and greater public accountability, and increasing competition among higher education institutions; all contribute towards changing the traditional role of academics. Academics of the institutions now operate in what Barnett (2000) terms “a world of super complexity”, where the very frameworks on which their professions are based are continuously in a state of flux.
Technological and economic changes, for example, have resulted in a reorganisation of time and space (Giddens 1984, cited in Unwin 2007).

This changing context of higher education (HE) both internationally and in India presents new challenges for educators. It is important to note that application of technology in teaching and learning has been one of the most striking major requirement and need in higher education (D’Andrea and Gosling 2005). Though the use of ICTs is presented as a solution to many of the teaching, learning and academic process to meet the challenges facing the current higher education landscape, it is important to note that the application and implementation of ICT systems has posed obstacles to the users.

Though there numerous challenges facing higher educational institutes in their use and implementation of ICT, responding postively with an approach to overcome these hurdles remain imperative and which is possible through developing coherent institutional strategies to change (McNaught and Kennedy, 2000 and Salmon, 2005), Higher education institutes may also focus on the impact of learning technologies (Beetham et al., 2001, Timmis, 2003, White and Oliver, 2007) and creation and development of systems and models that take on change (White and Oliver, 2007).

The strategy can be taken further by higher education institutions to focus on staff development in response to the many challenges faced (Smith and Oliver, 2000; White and Oliver, 2007), placing greater emphasis on the professionalisation of academic staff who will be of great assistance in successful implementation of ICT. Staff development units need to contribute to professional development of academic staff in Higher Education through programmes, module of training, workshops and short courses leading to know-how and working knowledge of use of ICT. It is through these initiatives that the academic staff will be able to support academic institutions to meet the demands through a well entrenched strategy of all round
development of human capital at all levels to meet challenges, changes and a complex world.

Referring to studies of Markus Mostert (2009), institutions have regarded ICTs as the solution to a range of educational problems. The study reveals that utility of ICTs in Higher Education teaching learning and other academic processes focuses on access to technology; that is, which refers to availability of computers, the Internet and bandwidth rather than on the way ICTs are being used in enriching of teaching and learning. This approach may have its own setbacks in terms of low benefits of applications of technology where ICTs are only used in transmission modes of teaching and learning. Studies have pointed out some failings of eLearning initiatives (Latchem, 2005). These learning’s have provided awareness and a growing concern that the application of ICT technologies in teaching and learning must be thoroughly investigated and researched upon to suit individual institution requirements of support to teaching and learning processes (Czerniewicz and Brown, 2006).

Pedagogical outputs may not be achieved if there is absence of systems and frameworks to imbibe and implement the right tools of ICT. Laurillard (2002); Mishra and Koehler (2006) and Unwin (2007), have cautioned against the use of ICTs without a conceptual framework or without a clear understanding of why and how the ICT will contribute to students’ learning. These insights have led some higher education institutions (HEIs) to understand that integration of ICTs, which meets pedagogical requirements that requires just not technical support, but the support of all systems in place, the right individuals who have the capability to do so and regular trainings for all educators and staff for professional use of ICT in teaching and learning.

There seems to be a wide variation in how HE practitioners conceptualize the integration of information and communication technologies (ICTs) in teaching and
learning. This implies a question concerning the institutions understanding of learning with ICTs and its implications. Often, the use of ICTs in teaching and learning should be taken more seriously for academic improvements and not just focus on curriculum development and assessment.
1.6 ICT Adoption Academia – challenges

The research work by Calsoft on ICT adoption in Higher Education in India have revealed key challenges affecting the utilization of ICT in Indian Higher Education which are:

- There is need for adequate Knowledge and Technology readiness
- Implementation challenges as ICT implementation has been an uphill task. Systems may be procured, but maintenance and running such systems are imperative. that have contributed to the failure of past initiatives
- There could be some barriers in knowledge dissemination.

1.7 Need for Study and Gaps Identified

Researcher identified gaps in the area of ICT adoption and use in HE in India through pilot study, literature review and researcher’s experience of working in the industry.

- The facts and figures may lead to understand the trends but fail to drive towards exact gaps and process weaknesses in the system.
- The surveys and statistics are available in numbers but they are under-interpreted or incorrectly represented when it comes to ICT adoption or usage management in Indian HE system.
- India is a region with one of biggest HE systems in the world. In view of its plural culture and demography, specific studies around ICT are rare. The Indian HE sector covers thousands of institutions and at different stages of development. It poses another challenge in itself.
- There are studies relevant to ICT adoption in the system that talk about feasibility or cost-benefit analysis etc. But the same information is not
publicly available in detail as well as it may be more applicable only to certain sets of institutions, if at all.

In view of the above gaps, researcher touched upon the length and breadth of the subject matter to identify challenges faced by HE institutions in ICT adoption with following aspects in focus –

**Specificity** – A spectrum of institutes was decided so that the study outcome can be applied to most of the institutions as much.

**Implementability** – Researcher focused on practical aspects involved in Indian HE scenario. Thereby, the outcome could be implementable.

**Manageability** – Various aspects like budget constraints, decision making etc. were also considered in the study.

**Compactability** – The research was focused on ICT use in teaching only. This was the need for the hour considering vast usage of ICT.

### 1.8 Problem Statement

Importance of ICT is underlined in Indian education system. It is not only changing the way teaching and learning happens but it is also going to pave the way for many years to come. Quality of education, reach and flexibility are some of the important factors about education ICT is changing for ever.

At the same time, it is also essential to understand preparedness of the system. Do we have enough readiness to face the changes – all the stakeholders of the system? Hence we thought of following areas for research under Indian higher education system –

- Existing ICT tools used by various academia world-wide – identifying best practices, how
• Direct and indirect benefits of education technology
• Understanding expectations of academia from new learning technologies
• Hurdles faced by institutions in procuring new tools and technologies that support teaching and learning processes
• Customization of education using ICT
• Importance of training in successful implementation of ICT

Though all above areas are important and pragmatic enough, we thought of digging deeper in hurdles faced by educators in adopting ICT in higher education and identifying a framework as a guideline to implementation of ICT.

There have been instances where Technology Adoption Model has been modified and used in education sector. But there have been certain limitations in using the popular model, especially when it comes to technology adoption in Indian education scenario. The researcher wanted to dissect the popular models and theories, identify stages missing, bring up implementable steps for academia in ICT implementation and generate a framework that is universal in nature but for Indian higher education institutions. All this required analytical study of hurdles faced by educators in ICT adoption and the measures thereby.

We also have tried to limit the scope of research to ICT usage for teaching. Since ICT is used in academia for numerous reasons besides only teaching. We decided to tools and technology usage used for teaching purpose only while working on the research.

“Study of difficulties in adopting e-learning and measures thereby, with specific reference to select professional education institutions in Pune” thus became the title of the study underlining following problem statements –
● How do different stakeholders of the system understand and view ICT adoption?
● Are there any relations between hurdles faced by one stakeholder with hurdles faced by others?
● Do such hurdles become the most crucial ones to address for seamless ICT implementation?
● How some of successful ICT implementations addressed the hurdles?
● Can one refer to a framework of ICT adoption, if any, to implement ICT in academia?

1.9 Objectives

We decided to begin with a pilot project to understand ICT awareness and identify major challenges faced by the academia in ICT adoption. This project helped us in narrowing down hurdles to only the crucial ones. At the same time, we realized a dire need for a standard framework as a guideline to academia when it comes to ICT adoption.

Following are the objectives of the study –

● Identify the most crucial hurdles that educators face as challenges while adopting ICT in teaching
● Understand the awareness about ICT amongst various stakeholders of the education system
● Identify limitations of existing technology adoption model while applying them to Indian education scenario
● Identify important influencers for educators in considering ICT adoption
● Develop a framework that can act as a model to implement ICT
1. Correlate Adoption Model to the measures to overcome challenges faced by educators in ICT adoption

1.10 Hypotheses of study

The following hypotheses were considered for the study:

1. Adoption of ICT is smoother when structured planning is in place.
2. Lack of Training and Awareness affects ICT adoption by academia adversely

1.11 Outcome of Study

ICT Adoption Model – recommended for higher education institutions in India
While the final outcome is the model as depicted above, it had a reworked framework as a guideline for ICT adoption. The final model is very specific to higher education institutions in India based on study on select institutions in Pune region.

We have also created another outcome deliverable that is based on the model. It consists of documentation for a sample academia that wants to adopt ICT. Documentation is included in the annexure. It will reinforce the model and support its usability through a use case.

We feel that proposed adoption model will certainly help higher education institutions to plan for ICT adoption. It is also important to note that institution may be at different stages of ICT adoption already and not necessary a beginner. But proposed model still applies to all types of stages as it begins with the current status.

1.12 Limitations of the study

The study was confined to higher educational institutes located at Pune.

For seamless integration of ICT in teaching and learning in higher education, it is imperative that educators apply ICT use on a regular basis in the teaching learning process so as to utilise the benefits of ICT in imparting subject or domain specific skills and knowledge. ICT’s can a play a vital role in transforming teaching, shifting the emphasis from a teacher centric to a learner centric system. This shift in emphasis needs a proper fit of ICT in every aspect of the curriculum, which will insist educators to use ICT. This aspect was not considered for the study, which needs further investigation.
Adoption of ICT in the academic process largely depends on the current available system within an institution. Much success of ICT depends on the efficiency of the current academic system. The study did not address this aspect, which requires in-depth study.

Collaborative efforts from many stakeholders will be the key to successful implementation of ICT integration for any higher educational institutions. Commitment to the process will lead to effective application of ICT in teaching and learning. This aspect needs focus and further investigation.