# Reality Check –Understanding and Adopting ICT Tools

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## Abstract

*Use of Information and Communication Technologies (ICT) in academia is well-known for its importance and effectiveness. At the same time, it is also one of aspects of any education system, which needs a consistent reality check for its adoption by educators. A research has been undertaken by the authors in developing ICT Adoption Model for Indian Higher Education Sector. The research aims to identify real challenges faced by the academia in ICT adoption, measures to overcome the challenges and come up with a framework in the form of Adoption Model for any institution to consider ICT for adoption.*

*With the diversity and expanse of Indian higher education system, challenges to adopt ICT too are numerous. It was essential to freeze upon major and common challenges faced by the academia while adopting ICT. Based on literature available in the forms of – research projects, MHRD and UNESCO's reports on ICT adoption, Technology Adoption Model theories, Change Management theory in technology adoption – researcher identified broad categories of challenges as hurdles faced by the educators. A set of technical education institutions were targeted to capture feedback from respondents on their take on challenges in ICT adoption. Outcome of the pilot study was a list of major challenges faced by educators in ICT adoption. The paper talks about ICT terminologies, literature reviewed and the study outcome in the process.*

## Keywords:

**Information and Communication Technologies, ICT, ICT terminologies, ICT Adoption, education system**

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## 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. Final objective of the study is going beyond, ICT adoption model, very specific to higher education academia in India.

## 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.

## ICT – in education

Education is the backbone of a nation. Education system plays amajor role indevelopment of modern economies. Understanding how education system works and how it evolved over time has been one of the most important research agendas in recent years. The education system of any economy performs following main tasks: first, it handles
the basic and higher education; second, it provides better opportunities of income; third itenhances the living standard and helps in social development. Information, Knowledge, and Communication Technology plays vital role in imparting

education in modern scenario. ICT changed the way of imparting education in modern era. Considering the higher education in India has seen the massive growth in post-independence era. At the time of independence [1]17 universities and about 400 colleges were there in India and today the numbers are – 520 universities, nearly 22,000 colleges, over 10 million students, 0.45 million teachers and one of largest higher education system in the world. Our education system focuses on creation of high quality and well trained human resources to fulfil the need of ever growing Indian economy, but on other hand it faces challenges at operational level.

In this environment, the need for technologically literate citizens and workers increases every year. Skilled people in the 21st century need to understand how to use technology tools. including computers, networking and other technologies, plus audio, video, and other media and multimedia tools which enable people to perform effectively at work and in their daily lives, using such tools as spread sheets for calculation, budgeting and building scenarios, graphic and multimedia

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[1] UGC Annual Report 2011

programme for presentations; data bases for research; and networks for communicating with others.

One of the most commonly cited reasons for using ICTs in the class- room has been to better prepare the current generation of students for a workplace where ICTs, particularly computers, the internet and related technologies, are becoming more and more ubiquitous. Technological literacy, or the ability to use ICTs effectively and efficiently, is thus seen as representing a competitive edge in an increasingly globalizing 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. The potential of ICTs to promote the acquisition of these skills is tied to their use as a tool for raising educational equity, including promoting to shift to a learner-centered environment.

The progress of any country depends upon the quality of education offered and practices. Indian education was well known for its Gurukul System of Education in the Vedic age. Education in India has undergone various phases and stages of development starting in the Vedic age to the Post-independent period. In all stages of development, There was a concern for bringing in quality education reflecting on the practical aspects in education. Teaching and learning in the 21st century should be markedly different from earlier times, as to teaching and learning are now occurring in an increasingly online world. Traditionally, learning environments were restricted to face– to- face delivery or where distance education was undertaken, delivery was largely characterized by the posting of printed resources and communication were often slow and cumbersome.

Integrating technology into teaching-learning transaction has been found to transform the teacher's role from being the traditional 'Sage on the Stage' to also being a 'Guide on the side,' and students' roles also change from being passive receivers of content to being more active participants and partners in the learning process[2].

"ICTs offer great potentials and advantages in enhancing students" [3]learning as revealed by Lopez (2003), among others. First, information and communication technologies offer a constructivist approach to learning through the provision of interactive learning experiences. Second, learning through ICTs is more effective as they provide opportunities for using multiple technologies (Video, Computer, Telecommunication, etc.), thereby providing visualization aids in the internationalization and understanding of difficult concepts and processes. This gives opportunities for providing links between theory and practice. Third, ICTs provide opportunities for students to gain valuable computer skills which are germane in today's job market. ICTs also provide students with repertoire of resources to enhance learning. Students have access to current and up-to minute information; with ease students can revise and update learning resources available to them. The use of ICT in education can improve memory retention, increase

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[2] Alley,1996; Repp, 1996; Roblyer, Edwards and Havriluk, 1997

[3] Lopez 2003

motivation and generally deepen understanding[4].

Selinger (2004) claimed that ICT can improve the quality of education because multimedia contents help to illustrate and explain difficult concepts in ways that were previously inaccessible through traditional teaching resources and methodologies.

Information and Communication Technology (ICT) plays a great role in strengthening the three traditional branches that make up the mission of higher education i.e teaching, research and service to the society. ICT changed the style of functioning of the educational system and its governance with the help of digital d ata, its storage, retrieval, manipulation and transmission. ICT works in three ways: - (i) communication and decision implementation, (ii) automating tedious task, and (iii) supporting new and existing tasks and processes. Use of ICTs can process information, create knowledgebase and make them available wherever and whenever necessary. Information and Communication Technologies (ICTs)in most cases have tremendous success in providing services at reduced costs to the people's door steps. ICTs have the same to do for making the higher education available to all classes of people throughout the country at a lower cost. As a result, on one hand people will have the access right on higher education and on the other hand will gain the necessary knowledge, skills, and experiences to serve the nation and prosper accordingly. In 21st century, one can hardly find a country where higher education through distance mode is not available. In fact it has been practiced since long before. But at present days, having revolution of ICTs, the higher education through distance mode has beenmore practical and well accepted by the all people around the globe. It is now being calledVirtual learning. In developed country, people are getting more interested in learning through Virtual Campus than that of a Brick-and-Mortar Campus. Virtual Campus is nothing but ICT enabled campus, where students are attending their classes, discussingwith teachers, accessing learning r esources, online exams, joining forums/club s,s ubmitting assignments etc. virtually having t he facility of real-timeinteractions between teacher and students.

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[4] Dede 1998

Higher education sector over the last decade has seen the rise to a multiplicity of new organizational structures designed for meeting new challenges. All of them would like to exploit the developments in information and communication technology to design, manage and to deliver courses and training modules, The need for open and flexible learning has exploded, so the technology to support new methods has been developing at an equally fast pace. The term information and communication technology (ICT) encompasses all the computerized teaching systems, such as CD-ROM, as well as all the telecommunication systems, such as web and video conferencing. This can support aspects of teaching and learning from courses' development,

presentation, delivery and support to administration, registration, assignment handling and marking, even when the student community is widely dispersed and never meets face–to–face.

Green S. A. (1996)[5], states that "the pursuit of the principle of quality means maintaining and applying academic and educational standards, both in the sense of specific expectations and requirements that should be complied with and in the sense of ideals of excellence that should be aimed at.

The definition of these expectations and ideals can differ from context to context, partly depending on the specific purposes pursued. Applying the principle of quality entails evaluating services and products against set standards, with a view to improvement, renewal or progress".

UNESCO (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 Rosswall, 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 ofinteractive learning media for improved quality, equity, and access in Higher

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[5] Green S.A. 1996

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 several ways: by increasing learner motivation and engagement, by facilitating the acquisition of basic skills, and by enhancing teacher training. ICTs such as videos, television and multimedia computer software that combine text, sound, and colorful, moving images can be used to provide challenging and authentic content that will engage the student in the learning process. Interactive radio likewise makes use of sound effects, songs, dramatizations, comic skits, and other performance conventions to compel the students.

## 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

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[6] UGC Annual Report 2011

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 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.

- Specifically, research shows that the use of computers as tutors, for drill and practice, and for instructional delivery, combined 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 traditional instruction alone. Students also 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.

## Higher education and ICT challenges

Higher education systems have grown exponentially in the last five decades to meet the demands of quality education for all. This aspect has further gained momentum due to swift advancements in Information and Communication Technology (ICT). Demand for skilled and competent labour is ever increasing in the contemporary globalised society. In this backdrop, access to quality in higher education for all has emerged as determining factor of economic growth and development. In order to increase the access to higher education and improving its reach to the remotest parts of the country contribution of open and distance learning facilities is on the increase. In addition, it is catering to life-long learning aspirations and that too at affordable cost. The last two decades have witnessed the inclusion of developments in ICTs in higher education systems around the world. Even then the challenge to develop a higher education system that is flexible and dynamic so as to holistically integrate the technology in the management and delivery of learning programmes is daunting.

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.

Internationally the way in which higher education (HE) is conceptualised is changing. Globalisation, massification, shrinking resources, the proliferation of information and communication technologies (ICTs), increased demands for quality assurance and greater public accountability, and increasing competition among higher education institutions have all contributed towards changing the traditional role of academics. Academics now operate in what Barnett (2000) terms "a world of supercomplexity", 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). Furthermore, the supercomplexity and uncertainty of the postmodern world have caused people to be more reflexive, which, in turn, has led to a heightened sense of ontological insecurity for academics (ibid).

This changing context of higher education (HE) both internationally and in India presents new challenges for educators. In particular, the expansion of the application of technology in teaching and learning has been one of the most ubiquitous major recent changes in higher education (D'Andrea and Gosling 2005). On the one hand the use of ICTs is presented as a solution to many of the teaching and learning challenges brought about by the new HE landscape, while, on the other hand, starting to use ICTs in their teaching and their students' learning often represents an almost insurmountable obstacle to lecturers.

Some of the ways in which higher education institutions have responded to the challenge of

implementing ICTs in teaching and learning include developing coherent institutional strategies to change (see for example, McNaught and Kennedy, 2000 and Salmon, 2005), focussing on the impactof learning technologies (Beetham et al., 2001, Timmis, 2003 in Conole, White and Oliver, 2007) andthe offering of models for representing and understanding organisational contexts and change management (Morgan, 1986 and Mumford, 2003 in Conole, White and Oliver, 2007).

Yet another strategy employed by higher education institutions in response to such challenges andwhich this study reports on,

focuses on support and staff development issues (Smith and Oliver,2000; Oliver and Dempster, 2003 in Conole, White and Oliver, 2007), placing greater emphasis on the professionalisation of academic staff as teachers and assessors. Staff development units are tasked with contributing to the professional development of academic staff in Higher Education through professional development workshops and courses leading to formal qualifications. Through these initiatives Academic Development (AD) staff need to find ways of not only helping academics cope with these changes, but also of assisting them in developing appropriate strategies for preparing their students to operate successfully in a world of "super complexity".

Many have regarded ICTs as the solution to a range of educational problems. Much of the discourse on using ICTs in HE teaching and learning, however, seems to focus on access to technology; that is, on the availability of computers, the Internet and bandwidth rather than on the way ICTs are being used in support of teaching and learning. In many contexts this focus on access has resulted in pedagogically poor applications of technology where ICTs are only used in transmission modes of teaching

and learning. Following some spectacular failings of eLearning projects globally, ( Latchem, 2005) there now seems to be a growing concern about the application of those technologies in teaching and learning to investigate how they can and are being used to support teaching and learning (see for example, Czerniewicz and Brown, 2006).

In addition, there has been a growing recognition that technology used in the absence of a sound theoretical framework or pedagogy is generally not very effective in reaching programme goals.

Laurillard (2002); Mishra and Koehler (2006) and Unwin (2007), for example, 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 realise that pedagogically sound integration of ICTs in educators  teaching requires more than technical support; it also needs professional development for educators to use ICTs in their 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 our understanding of learning with ICTs and its implications. The use of ICTs in teaching and learning is dealt with in isolation from other core modules such as curriculum development, assessment, evaluation and learning design.

## 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 eact 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.

## 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.

## 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 pilot study 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

A mix of institutions running professional education programs were selected as a sample for this research. The research aims to develop ICT Adoption Model eventually when the final analysis is over.

One of the phases of the research involved understanding the issues faced by the educators in adopting Information and Communications Technology (ICT) tools for teaching. We are limiting our research to the use of ICT for teaching purpose only (and not considering ICT used in running the institution or any promotional purposes).

110 educators were interviewed all across the country representing institutions running Business, Engineering, Management, Pharmacy programs, which are considered as professional programs by one of Indian technical education councils.

Any use of information and communication technologies (ICT) in teaching and learning is electronic learning. Common ICT tools used to make teaching learning effective include -

- **Content** – Web-based, CD, DVD, Stored Audio Video, Multi-media
- **Platform** – Portal, Webinar, Social Media
- **Communication** – Radio, Chat, Email, Message, Television, Blogs, Forums Synchronous as well as Asynchronous

This snippet would present only a few findings as all the findings and data from interview and survey cannot be accommodated here. Significant among the findings are given below –

- More than 50% respondents (60 educators) do not use any recognized ICT tool at all

- 40% of respondents mentioned that there was no formal training used by them while adopting any new technology tool
- In most of the cases, there was no ICT adoption process followed for easy adaption
- Top Three ICT tools respondents were aware of include – CD/DVD, Powerpoint Presentation, Online Videos – all of them though widely used everywhere, mow have many and technologically advanced alternatives too!
- Top ICT tools maximum respondents are NOT aware of – Online Classroom Platform, Using Webinars, Radio in teaching

We also asked the respondents about why there is a lag in adopting ICT for teaching purposes. Complexity in technology, No peer pressure (or parallel) and No Information of awareness about the benefits and uses of ICT – were top three reasons cited.

All respondents were considered for responses on many factors.

*Generic Factors as challenges considered in*

*Pilot Study*

| Sr | Factor |
|----|--------|
| 1 | Training |
| 2 | Benefit Awareness |
| 3 | Information of existing ICT |
| 4 | Influencers |
| 5 | Planning |
| 6 | Infrastructure |
| 7 | Funds |
| 8 | Authority Pressure |
| 9 | Mandatory Norms |
| 10 | Community Stakeholders |

## Outcome of Pilot Study

The pilot study involved,

i. Discussions with some of the Directors / founders to seek views regarding challenges to ICT adoption considering factors such as budgetary constraints, awareness, technology phobia, peer pressure, additional learning, mandatory requirements, culture, zeal to progress and planning.

ii. Discussions with Directors and Professors led to identify factors to understand the difficulties involved. This was done through a survey carried out at 9 educational institutions generating responses from about 90 educators.

A mix of institutions running professional education programs were selected as a sample for this research. The research aims to develop ICT Adoption Model eventually when the final analysis is over.

*Major Challenges – Outcome of Pilot Study*

| Sr | Factor | Focus areas (determinants) |
|----|--------|----------------------------|
| 1 | Training | Training on education Technology through FDPs |
| | | Skip training on ICT – a difficulty |
| | | Complexity in education technology as a difficulty |
| 2 | Benefit Awareness | Empowerment to teacher |
| | | More innovation in teaching |
| | | Better teaching material |
| | | Easy access to resources |
| | | Transparency and engagement |

|   |   | Cost Efficiency |
|---|---|---|
|   |   | Information on availability and awareness  of learning material |
| 3 | Information of    existing ICT | Website , emails, official webpage |
|   |   | network |
|   |   | ERP |
|   |   | Database subscriptions |
|   |   | e-content |
| 4 | Influencers | Norms by authority agencies |
|   |   | Initiatives by competitive institutions |
|   |   | Changing trends in education world-wide |
|   |   | Demand from stake holders |
| 5 | Planning | Conduct of training programmes |
|   |   | Introduction of new teaching practice |
|   |   | New teaching tool |
|   |   | Technology Infrastructure changes |
|   |   | New teaching material using ICT tools |
|   |   | Creation of technology usage process |



Hurdles in ICT adoption (%)

- No Information
- None uses
- Don't believe in e-learning
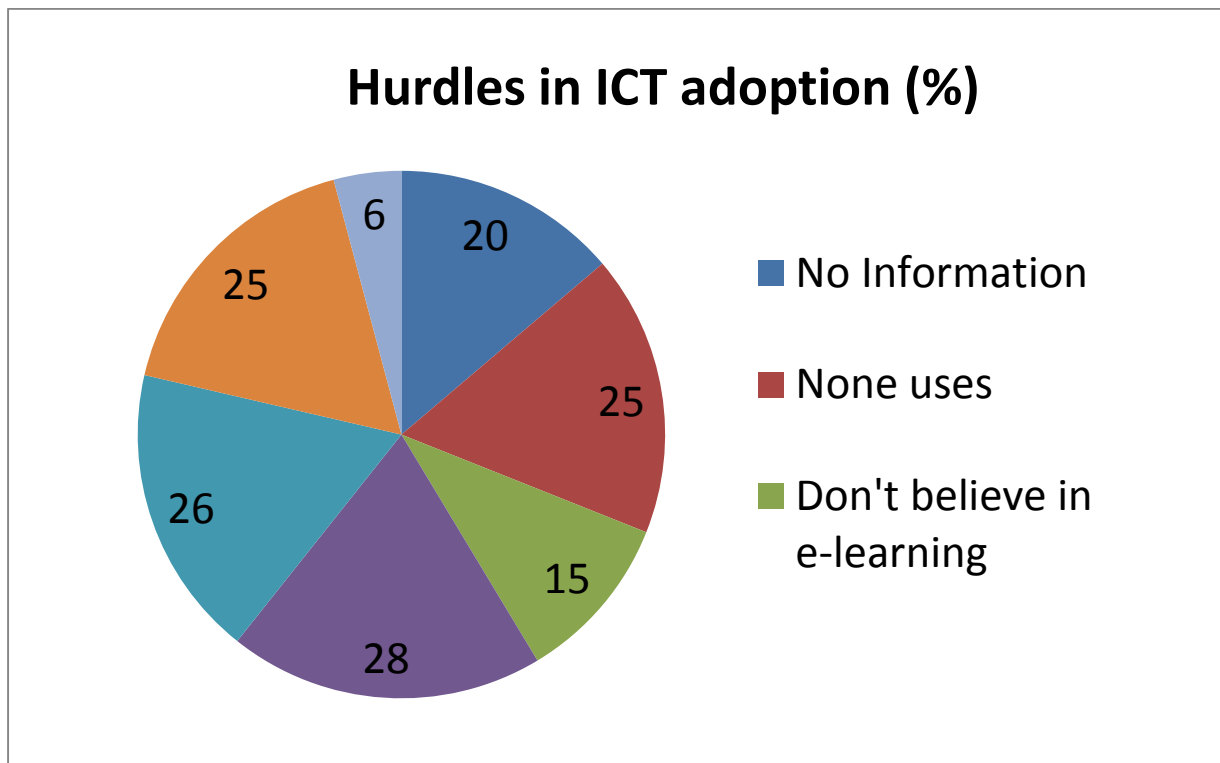
Also one of questions was to seek suggestions to improve use of ICT for teaching. Besides Training and Infrastructure improvement, 'Making it

Mandatory' would be useful – is what many believe in! Certainly, this may just provoke the government agencies to think about incentivizing teachers who use ICT!!

## Measures to ICT adoption
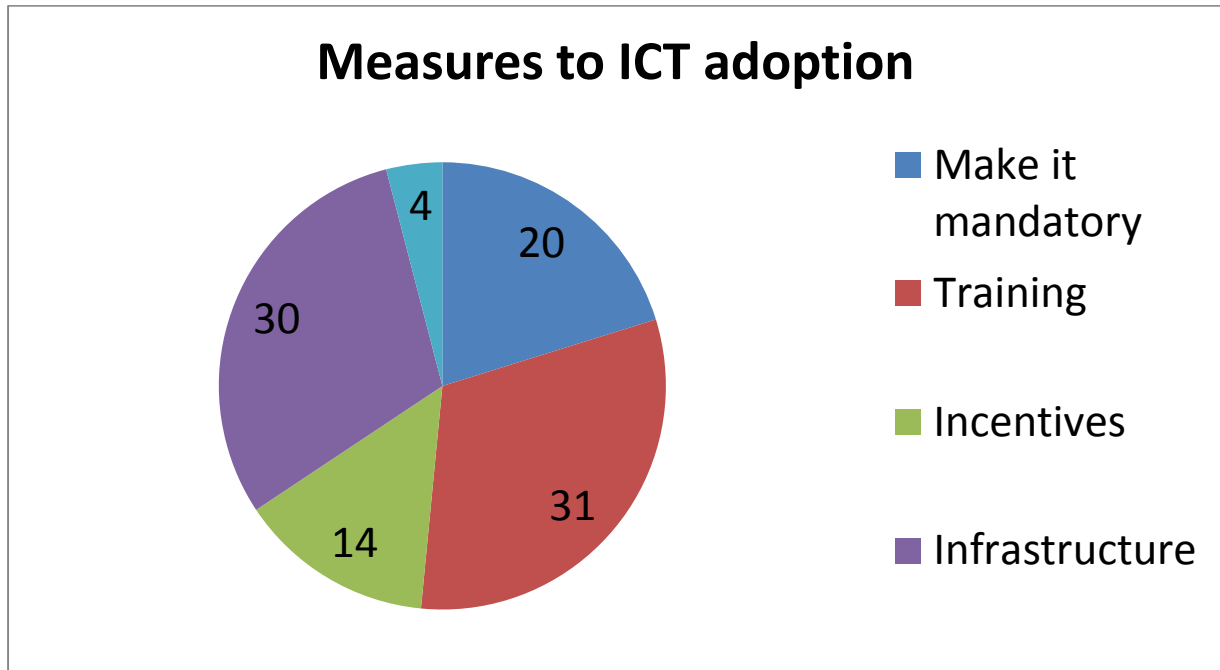


Further areas this research would focus on include –

- Culture at the institution
- Change Management aspects including resistance to change, creating change champions
- Step-by-step ICT adoption model for better and faster adoption
- Common and consistent circulation of knowledge to create awareness about such tools

## Conclusions

Certainly, one has to analyze the psyche of a teacher as what would attract him to adopt ICT – factors like age and experience are equally important besides subject area of a teacher. Many variables (and hence scope for hypotheses!), nevertheless, any initiative must be built upon the very ground realities when it comes to technology adoption. A

separate initiative is certainly needed before

we get to implement NMEICT projects.

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