



## **ICT For Education (ICT4E) Translation In Tezpur University – A Case Study**

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***Abstract:***

*Advancements in Information Communication Technologies (ICT) have resulted in the falling cost and rising efficiency in the transmission, retrieval and analysis of information.*

*The paper introduces India's Higher education policies on ICT for Education (ICT4E). The main focus of the paper is to see how the Policies are being communicated by different stakeholders in Tezpur University with special emphasis on how it is translated by faculties and students who are the end-users.*

*A Qualitative interpretive case study methodology is followed using Grounded Theory to interpret and analyze data based on interviews, document study and observations. Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis from different stakeholder's perspective further highlights the advantages and the challenges faced in the actual implementation of ICT4E in Tezpur University situated in a remote location in a developing country like India.*

***Keywords:*** *National educational policies, ICT for education (ICT4E), Higher education*

## **1.Introduction And Statement Of Problem**

### *1.1.ICT4E Opportunities And Challenges*

In the current Information society, International and National educational policies are geared towards encouraging knowledge generation, knowledge acquisition, knowledge diffusion, and the development of knowledge using ICT. ICT for Education (ICT4E) can be used as a tool in the process of education as [1]:- Informative tool: It provides vast amount of data in various formats such as audio, video, documents; Situating tool: It creates situations, which the student experiences in real life. Thus, simulation and virtual reality is possible; Constructive tool: To manipulate the data and generate analysis; Communicative tool: It can be used to remove communication barriers such as that of space and time.

Higher education institutions are not only producing and supporting technological innovations but are at the same time intensive users and subject to the limitations of ICT. The ICT revolution is already having significant impacts on students' learning processes (e.g. through the availability of virtual learning environments and new sources of information) challenging both students and teachers to re-assess their conceptions about learning and instruction [2]. Therefore, the challenges related to the use of ICT are not only technical but are also related to pedagogical thinking and organizational structures [3]. New technologies require new professionals not only to maintain and upgrade ICT support, but also to work in teaching development units and centres which address the pedagogical (re)training of professors [4].

### *1.2.ICT For Higher Education Initiatives In India*

The Vision 2020 envisages India to be a knowledge superpower. Universities and colleges provide higher education to more than nine million students. The vision is to electronically reach out a large number of students, teachers and general public with quality educational material, so as to address the issues of access to higher education with equity and quality [5].

In India, policy framework, financial support and guidelines to ensure a national standard of education is provided by the Government of India through the Ministry of Human Resource Development (MHRD). India has over 300 Universities out of which presently there are thirty-nine (39) Central Universities. University Grants Commission (UGC) is responsible for coordination, determination and maintenance of standards, release of

grants. National policy documents supporting ICT for Education (ICT4E) can be seen in Ministry of Human Resource Development (MHRD)'s web based training is the National Programme on Technology Enhanced Learning (NPTEL), National Knowledge Commission (NKC), National Knowledge Network (NKN), National Mission on Education through ICT (NME-ICT).

The operational objective of NPTEL is to make high quality learning material available to students of engineering institutions across the country by exploiting the advances in information and communication technology. NKN which has been launched based on the recommendation of the NKC, will make its presence felt in 378 Universities and 18,064 colleges. The network will focus on digitization and networking of the educational institutions, making available bandwidth to facilitate collaborative research and knowledge sharing. NME-ICT aims to leverage ICTs to provide high-quality, personalized, and interactive knowledge modules over the Internet/intranet to all learners in higher education institutions. Information and Library Network (INFLIBNET) is set out to be a major player in promoting scholarly communication among academicians and researchers in India through the UGC-INFONET Digital Library Consortium. EDUSAT is the first Indian satellite built mainly to meet the demand for an interactive satellite based distance education system especially for the development of the population in remote and rural locations. Consortium for Educational Communication (CEC) is an Inter University Centre set up by University Grants Commission (UGC) to use electronic media for development of higher education in the country. CEC currently has 17 Educational Multimedia Research Centres (EMMRCs) in various parts of the country. CEC is responsible for the use of various new technologies for enhancing standards of higher education in the country. CEC runs 24 hrs. Higher Education channel known as Vyas. CEC is also providing a service called 'Lecture on Demand (LoD)'. ERNET with the funding from UNDP, was created to generate expertise R&D and education in the country in the area of networking and Internet in the country.

The development and challenges of ICT for education needs to be meaningfully analyzed as a unique construction in each country.

### *1.3. Brief Overview of Tezpur University*

Tezpur University established in 1994 is situated at Napaam, Assam, India. Napaam is a rural area surrounded by people of diverse caste, religion and language. The University has 2013 students and 171 teachers. The University has four Schools of study:

Engineering, Humanities and Social Sciences, Management Sciences, Science and Technology. There are 18 departments which offer a total of 32 programmes. The University envisages to utilize distance education technique and modern communication technologies to provide Access to higher education for large segment of the population, and in particular the disadvantaged group such as those living in remote and rural areas; to upgrade the professional knowledge and skill of in-service personnel, in particular schoolteachers, medical personnel and extension staff, and to provide opportunities for lifelong learning for adults; and provide an innovative system of university level education flexible in regard to methods and space of learning and encourage excellence in new fields of knowledge. This would go in line with the four main rationales for introducing ICT in education as [6]:

- Social: perceived role that technology now plays in society and the need for familiarizing students with technology.
- Vocational: preparing students for jobs that require skills in technology.
- Catalytic: utility of technology to improve performance and effectiveness in teaching, management and many other social activities.
- Pedagogical: to utilize technology in enhancing learning, flexibility and efficiency in curriculum delivery

The challenge therefore lies in understanding how ICT4E is translated by different Stakeholders.

#### *1.4. ICT4E translation by Actors in Tezpur University*

##### 1.4.1. Administration

The Vice-Chancellor exercises general supervision and control over the affairs of the University and gives effect to the decision of all the authorities of the University. The Statutory authorities are: the Board of Management, the Finance Committee, the Academic Council, the Planning Board, the Board of Studies and the Building Committee. Since its inception, the University has placed emphasis in ICT infrastructure to support its academic activities as well as in the administration.

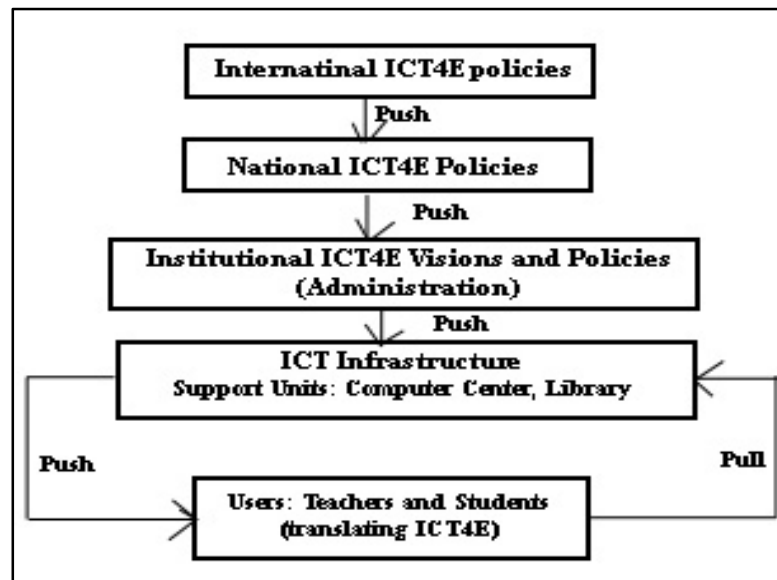


Figure 1: ICT4E Actors and Translation in Tezpur University

#### 1.4.2. Computer Centre

Computer Centre (established in 1997) plays a main role in catering to the academic programmes as well as for maintenance of the other computing resources in the university. A campus LAN with optical fiber backbone connecting the academic as well as administrative departments spread over the the University campus of 241 acres. Internet connectivity is provided throughout the campus with 10Mbps OFC Link (UGC-INFONET), a 2Mbps Leased Line Link and a VSAT link of 512Kbps. Wireless LAN has also been set-up to extend the LAN connectivity to the Hostels and the residential areas. The Computer Centre Committee consisting of one representative from each of the user departments with the Vice-Chancellor as the chairman and the Professor In charge of the centre as its convener. The committee meets at least once in a semester to review the functioning of the Centre and to take major operational and policy decisions. Accommodating the requirements of different departments in the time slots of central computer centre is becoming difficult with time. Moreover, the distance of the central computer centre from many of the user departments is also becoming a hindrance to the use of the centre. As a result the centralization of the computing facilities is viewed as a major drawback by a section of the user community. This has led to a trend of procuring computers for general use by different departments of the University and setting up computer

laboratories of their own. Maintenance of these computing resources has become a cause for serious concern over the years. With the increase in the size of the computing resources in the University a need has also arisen for streamlining the process of procurement, maintenance and disposal of the computing resources in the University. A policy document in this regard has therefore become necessary in the University.

## **2. Central Library**

The library holds 47755 volumes of print documents and subscribed 1011 titles of current journals (print 233, online 778) and one databases through INDEST-AICTE Consortium and other publishers. The UGC-Infonet Consortia of INFLIBNET Center is providing access facility to 6624 e-journals and ten databases. The library also holds 81 VCDs and more then 1200 CDs scattering to different thought contents. Specific services are generated on demand to meet the specific needs of patrons in the category of faculties and those involved with specific research projects running under them. Such services includes: Compilation of bibliographies; Channelizing the book order and supply chain; Article alert service against specific titles of print journal (limited way); and Selective Dissemination of Information Service. The library at present is facing the challenge of maintaining a logical and reasonable balance between electronic and traditional resources. Library is providing personalized services like research support service section to assist researchers with their information requirements. There has been a decrease in the number of physical library users. Through ICT library is trying to increase the number of virtual users. “We now have 60% of virtual users and only 40% of actual people using the library.”

## **3. Deans And Head Of Departments**

Deans and HODs are responsible for looking into the overall functioning of their respective Schools and Departments. Permission for setting-up of computing laboratories facility is given by the Vice Chancellor on recommendation by the concerned School Board on receiving proper justification from a department. Such specialized Labs may be funded by other funding agencies through research projects, or through departmental plan grants. Such Labs are maintained either by technical staff of the department, third parties, or by personnel employed under the concerned projects.

#### **4. Teachers**

In ICT in education programs, teachers are ‘the key to whether technology is used appropriately and effectively’ [7]. Categories of ICT users among the teachers in Tezpur University include teachers who have prior exposure to ICT and those who are trying to pick up through assistance of technical staff and/or colleagues. Depending on the understanding of ICT, teachers from different disciplines have administered the usage of ICT4E at different levels. Though the infrastructure availability has served as a major push factor, incorporating ICT4E is still an individual enterprise. The following major trends have been noticed:

##### *4.1. Usage*

In terms of multimedia teaching aids in classrooms and usage of Word processing for routine task related to teaching and research; Access to Knowledge Base - various E-Resources which are facilitated by the university administration, under the broader framework of the UGC policies- e journals INFLIBNET; for Communicating and sharing of information via emails. A more advanced usage by very few teachers includes uploading of lesson materials and providing other resources in their homepages through the university website. ICT is helping in communication, knowledge sharing and networking though innovative use of ICT is still nonexistent. Curriculum is another driving factor for the usage/non-usage of ICT.

“We change curriculum every 3 years- changes are based on feedback from the students, student’s placement/job, developments and changes happening in curriculum in the subject in different places. ICT skills required is also considered, which may reflect about 20% requirement”.

##### *4.2. Attitude Towards ICT*

Though most of the teachers have a positive attitude towards ICT, they are not sure as to how it can be incorporated in pedagogy.

“We are using it. ICT is there, but how to make use of it?” “I do not use ICT”.

“ICT is facilitating but ‘ICT can be intimidating’”.

“Faculties who don’t use ICT are not using it not because they are unwilling, but because they are uncomfortable”.

It is observed that ICT is still understood from the technocratic stance by teachers whose usage of ICT is limited. Policies need to be developed so that ICT can be seen from the socio-technical perspective.

“If we are technology dependent, there will some gaps in learning... Speed of teaching increases, it facilitates but at the same time students might find it hard to catch up since they have been more used to traditional form of teaching since their schooling.’

The teachers feel that ICT has helped them in filling up the location disadvantage by connecting them to the rest of the world; helped in networking with the industry and collaborating with other institutes nationally and globally.

“I completed my PhD from UK by communicating with my guide using ICT, I have students working in Germany now doing their Master’s there, and I guide them from here”.

“School of engineering has all the videos under NPTEL, we have the video streaming facility. Students are also using freely available web resources from Massachusetts Institute of Technology (MIT)”.

However it has been observed that even within the school of engineering, all the faculties are not aware about NPTEL or other such projects, hence its usage depends on the teachers who are aware.

ICT has helped in the preservation of and contribution of indigenous knowledge.

“We are archiving/documenting (films, uploading on the website), digitizing and making indigenous knowledge available on the web – our contribution to the knowledge pool”.

#### *4.3.Barriers And Challenges*

In spite of the number of initiatives taken by the National policies with regard to ICT4E, there are very few teachers who are aware of the Policies and benefits associated. Using ICT4E requires extra time and effort as the teachers have not received any training on ICT for pedagogy.

“I had attempted to create a Blog, upload my lessons for students to be able to access lessons that they missed, or other teaching material which I have to distribute in class, for students to come back and refer and also to post their problems (attempt to provide Flexibility that ICT gives). Ultimately it did not happen because our network, there are certain restrictions there, Blogging etc. to a certain extent are restricted – so when I faced a little bit of trouble, I gave up that idea – Extra effort and extra Time”.



Fear of the type of knowledge created in pedagogy by the students (plagiarism) and teachers (bad teachers) is an obstacle/barrier in adoption of ICT.

“ICT cannot take the place of good pedagogy, because ICT is just a tool. A bad teacher can sometimes use ICT to cover up”.

“Fear of technology is always there among the humanities people”

“I am scared of making mistakes in the classroom while using ‘that’, and taking up a lot of time in trying to fix that and loose/waste time”

Regulation- As per the computer usage policy of the university, accessing undesirable websites using the University computing resources is prohibited. Hence, each user is tracked and access to certain websites are blocked which might be containing certain string of words. Youtube and Orkut were blocked earlier. You tube is now partially open.

“Certain restrictions are there which does not look into the extended social sciences frame work of looking into new media, of researching and working on new media”.

“For a University like TZU which has a stated objective towards being a Science and Technology University, for social science and humanities disciplines like our’s where we believe that Youtube and other sites are an academic resource, we have problems”.

However for certain websites which are blocked but are required for academic purpose, the faculty in charge can write a request form to the Computer center so that a particular URL can be accessed.

There is a divide between ICT as a technology and teachers using ICT in pedagogy.

## **5.Students**

ICT has enabled quick and more information through ICT and has helped in collaboration and networking. The following points can be noted in relation to student’s translation of ICT in Tezpur University:

- Capacity Building: 20% of students who come from rural areas do not have any prior knowledge in using ICT. They also face language problem. So a Basic skills programme in Computers was introduced for all the newly enrolled students. This has helped in bridging the gap. Some of the challenges faced in such programme was that the interest level of the student did not match as some of the students in the class were already quite computer savvy. In certain cases since the courses were conducted by staff from computer science background, the humanities and social science students had a problem in relating. The course has been revoked in

some streams and in some it is kept optional. Contextualizing the course as per the requirement of different departments would help.

- There is the need for skills on Information and Knowledge management. Students have mentioned the need of such courses as most of the time they are overwhelmed with Information overload in the internet. Students are receiving training from the library department to help them with Information search in locating E-Resources.

The top five most visited websites ranked in the order of:

- Google
- Face Book
- Orkut
- Gmail
- Alter Bridge
- INFLIBNET and E-Resources are heavily used by research students as each student is provided with an internet access point in the department. Students enrolled for Integrated and Master's programme, use ICT as per the need of curriculum or the initiatives taken by their teachers. Comparatively they rely more on text books and traditional method of knowledge acquisition. Lack of time and erratic internet connection, limited computers for individual use are other factors pointed out which restricts their usage of ICT4E. Usage of EDUSAT facility is also limited because in some disciplines, the required lectures are not available. However, the major hindrance is the problem in synchronizing the time with the experts who are to deliver their lectures using EDUSAT as the time schedule and time slot given do not go well with the class timing of the students.
- Depending on their individual level of interest and skills some students are also making use of Web2.0 and other ICT networks to enhance their knowledge gathering and creation. Hence, there is a digital divide among the students.
- Students are still juggling between traditional medium and the new medium of learning.
- Some of the students are not aware about IPR issues and plagiarism.

Motivation to use ICT4E, access to ICT, conflicting time/other priorities, learning style, technological confidence and curriculum are factors which effect ICT4E in the context of the students.

### **6. Discussion and Key Insights**

The students and faculties have benefited with the usage of services provided by services like INFLIBNET and ERNET. The actors are still at the initial stage of subscribing to NKN and NME-ICT. A major effort has been made at the policy level and infrastructure level to provide access to ICT. To incorporate it at the user's level more flexibility will be required in terms of making ICT4E learner oriented and not institution oriented. Contextualized capacity building is one of the key areas where there is a scope of development. There is a lack of trained pool of teachers, who can efficiently train the students and incorporate ICT in pedagogy.

“We are not yet ready because somehow there is a problem of interpretation- the way we interpret knowledge, we interpret technology which would really bring a change in the way we understand knowledge... interpretation - there is a problem there”.

Though most of the teachers acknowledge the importance of ICT4E, teachers are still comfortable with the Traditional form. ‘Still prefer chalk n board’ method of teaching. Hence, capacity building is required so that faculties can implement ICT in their teaching and learning practices. Gap is also seen in terms of lack of individual enterprise. Access to ICT does not ensure Equity; Digital Divide can be seen in the rate of diffusion of ICT among peers in institutions. Incentives to motivate teachers who are using ICT4E should help in creation of conducive learning environment to encourage Peer to Peer influence. Technophobia, issues related to plagiarism, fear of Dependency on Technology, reliability of information from the internet; Concept of Knowledge: what kind of knowledge is produced with the use of ICT? Tacit Knowledge vs. Explicit Knowledge gives rise to the need of awareness on Knowledge Management using ICT.

### **7. SWOT Analysis**

The following have been listed as the Strengths, Weaknesses, Opportunities, and Threats (SWOT) of ICT implementation by different stakeholders in Tezpur University.

### *7.1.Strengths*

Pro-ICT Visions and Policies; adequate and continually upgraded ICT infrastructure; Self managed ICT services, skilled faculties in technology oriented departments; cost effective adoption methodology; Collaboration with external experts in place to strengthen ICT4E; human and infrastructural backup; good range of E-Resources subscription; Good LAN connection; good work culture; flexibility in adopting technological changes as far as the computer center is concerned.

### *7.2.Weaknesses*

Lack of ICT policy framework; inadequate support staff, end user technical support is poor, insufficient manpower for ICT support; inordinate delays in administrative procedures related to ICT infrastructure and maintenance; Non uniform ICT4E skills and awareness across departments; remoteness of location; lack of training; slow learning process of non IT staff in use of ICT; VSAT speed inadequate at present; technical infrastructure inadequate; erratic Wi-Fi connection; lack of proper focus in policies; impersonal approach; lack of publicity of materials available under national projects and funding opportunities available; insufficient budget for ICT; lack of coordination between the different government projects.

### *7.3.Opportunities*

Funding agencies ready to support ICT initiatives; Favorable ICT4E national policies; good amount of technical students available for support, they can be associated with ICT infrastructure (software and hardware) development; supportive staff and students; teaching and research targeting regional indigenous knowledge; cloud computing, grid computing etc. with high speed connectivity; collaborative and multi-institutional research and services; ultimate aim of paperless office.

### *7.4.Threats*

Data storage plan insufficient; no disaster recovery plan; potential misuse of ICT-plagiarism; unrealistic expectation regarding ICT facilities; technology obsolesce; classroom face to face interaction may be disrupted; expert visit might be hampered by relying on virtual lectures; stereotype learning.

ICT4E change agents would involve the policies, process, ICT tools, Knowledge enablers and learners. Constant progress Monitoring and Evaluation of implementation of policies is required to increase accountability.

### **8. Conclusion**

India is a vast geography with varying levels of development in different parts of the country, and therefore experiences of using ICTs for education across the country also reflect this diversity. While some interventions have been immensely successful in one area the same interventions in another part of the country have not succeeded. A wide spectrum of initiatives exists in the country. Better coordination between different government departments, with responsibility for IT and education initiatives would result in more streamlined and effective implementation of major schemes. Curriculum decisions, infrastructure decisions, content decisions, policy making, and policy implementation are all taken up by different bodies at different levels. Some harmonization and coordination is required [8].

For a young University like Tezpur University located in a remote area, ICT has helped in networking and connectivity. The University still faces several challenges in the aspect of ICT4E as it is at an Adoption stage where technology is being used to support traditional instruction. The threat would be if ICT is understood from a technocentric perspective by the users. The university is responding to the Global knowledge paradigm and is planning of launching Distance Education which will make maximum usage of ICT4E and is also proposing a digital campus in the near future.

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