Effectiveness of ICT in Strengthening the Process of Higher Education System in India

Debarun Chakraborty, Soumya Kanti Dhara & Adrinil Santra
Haldia Institute of Technology, Haldia, West Bengal, India

Abstract
In today’s era, Information and Communication Technology (ICT) is having a magnanimous influence on higher education system of any country. India is likewise one of them and the examination intends to decide the viability of ICT in fortifying the procedure of advanced education framework in this nation. There are four factors which have been properly identified from various secondary sources and those are availability, usage, knowledge and cost. Analyzing these four factors, the research is trying to explore the impact of ICT. The study has been conducted in various colleges and universities in West Bengal, India. 386 examples have been gathered with the assistance of an organized poll and 5point likert scale has been utilized to lead the overview. Convenience sampling technique has been utilized to gather the examples from different universities and colleges. To test the hypothesis and find out the result Exploratory Factor Analysis and Multiple Regression Analysis have been used. The findings of the survey claim that cost of ICT is one of the most influencing factors on effectiveness of ICT.

Keywords: ICT, Educational Efficiency, Availability of ICT, Top-down, LEA

JEL Classification: M10

Paper Classification: Research Paper

Introduction
Higher Education System in India comprises the educational programs – Diploma, Graduation, Post-Graduation, Doctoral, Post-Doctoral and Fellowship offered to the candidates to enroll under colleges, institutes, universities and research centers in enhancing their knowledge for practical implication. A large number of educational institutions have been set up in India owned by Government or Private Entities. The primary objective of the educational institutions is to deliver knowledge in the most effective manner through proper utilization of their input resources comprising teachers, classrooms, libraries, and laboratories. Every program has specific outcomes, but the most common outcome is to inculcate knowledge among the incumbents for further studies or professional competencies.

Conventional strategies for instructing were common before twentieth Century, however, fast advancement occurred from the mid of twentieth Century in the field of software engineering, media communications and data innovation that are changing the customary arrangement of
training into digitized framework in making the coveted results increasingly powerful and effective.

Aside from learning improvement and reasonable preparing for the occupants looking for advanced education, the job of Information and Communication Technology (ICT) in planning the learning procedure has broad impact later on with an attention on preparing the educator during the time spent on instructive development. With the presumption that educators assume a nonentity job in masterminding the learning procedure, instructor preparing foundations are taking new activities for infrastructural improvements in the field of ICT in setting up the planned educators for fortifying their future job. The nature and degree to which ICT is being utilized in instruction is thought to be an aftereffect of collaboration between ‘top-down’ and ‘base up’ forms. The significant issue lies in the reality of fruitful reconciliation of ICT with the educational programs of advanced education in improving the instructing and learning process. Despite of huge efforts in positioning ICT as a central dogma of higher education system, there lies a fact that many candidates seeking higher education and the teachers concerned are not able to use the benefits facilitated by ICT efficiently in their academic purpose due to certain constraints.

Integration of computer mediated communication, for the purpose of teaching along with supportive tasks poses a big challenge for teachers. There lies another difficulty of creating a powerful learning environment for the teachers via computer mediated network where rich contexts are to be presented and authentic tasks are to be assigned to the incumbents irrespective of time and place. ICT lined up with great learning conditions made by the educators can be compelling if there is advantageous access to registering/cell phones, for example, work areas, PCs, note pads, tablets, cell phones and so on accessible both for the instructors and additionally understudies whenever and at wherever. Moreover, the skill-set of the teachers need to be nurtured in getting acquainted with the digital learning environment.

Issues identified with educators’ preparation, support and upgradation of equipment and programming can be tended to through unified checking framework by the Ministry of Higher Education of being the skillful specialist in India, which may prompt direct supervision on schools, organizations, and colleges of advanced education framework.

It is an easily proven wrong issue that ICT has an important job in giving a stage to the competitors with visual or hearing weakness to guarantee dynamic interest in advanced education. In the utilization of ICT in advanced education for the occupants having visual or hearing disability, appropriate devices should be created, and exceptional preparing system ought to be intended for the educators and additionally understudies for their use. In the event that ICT is to be effectively incorporated into the educational modules of advanced education framework, a full-time ICT organizer is basic. An ICT aficionado who is proficient, dynamic and has great initiative quality can be a full-time organizer in directing and actualizing ICT in the schools, establishments and colleges.

Review of Literature

Nisar, Munir & Shafqat (2011) led an investigation to know the impingement of ICT in scholastic arrangement of Pakistan and the results uncovered that among the four variables – accessibility, use, information and viability of ICT; accessibility and use of ICT have higher effect in improving information and learning aptitudes of understudies. This shows change in scholarly proficiency and in addition commitment for the scholastic framework to gadget new approaches relating to the utilization and advantages of ICT.
Ali, Haolader & Muhammad (2013) found that instructors and executives regularly confront issues on the viable coordination of ICT into classroom rehearses. An exact examination was directed in higher establishments of learning in Uganda to discover the elements impacting the utilization of ICT to make educating and learning successful and distinguish the advancements in the instructing learning process realized by ICT. The discoveries of this examination uncovered that instructors and chairmen had firmly supported the joining of ICT into educating learning forms. ICT might be accounted in bringing the advancements, for example, e-learning, online understudy enlistment, online investigation material, online conference with scholarly specialists, in the educating learning process. The shot of successful combination of ICT in instructing learning procedure can be expanded through every one of these components. More preparing ought to be bestowed to the educators and chairmen in understanding the noteworthiness and use of ICT.

Sarkar (2012) in his examination featured the job of ICT in advanced education in India in the 21st century. The investigation uncovers that the organization of ICT in scholastics is expanding at a quicker pace crosswise over different territories of the nation. One of the often-happening issues of utilizing ICT in scholastics is to organize the decision of innovation as opposed to instructive necessities. Different learning openings can be opened by using ICT to upgrade the nature of training with enhanced showing techniques and better learning results. Utilization of ICT in advanced education may prompt scholastic improvement and also financial advancement of the nation. Meenakshi (2013) recommended that if instructive establishments are to completely misuse the capability of ICT as instructive devices, spotlight ought to be given on both instructive improvement and in addition proficient advancement of the instructor as per his scholarly administrations. The paper uncovered that each one of those instructors who are not well familiar with PCs and other innovation, communicated unmistakable fascination in experiencing and preparing for the same and they can be made ready to make full use of accessible assets. Notwithstanding the above both regulatory and specialized help in the instructive establishment are required for full working of the framework involving PCs and different advancements to make ICT more successful. Eng (2005) studied United States and United Kindom to explore the scientists’ system to comprehend the effect of ICT on learning. The objective is evaluation of the potential of ICT on learning outcomes of the students and its importance in academics for further research. From the consistency of the outcomes with legitimate documentation it was presumed that ICT can be powerful towards positive commitment in the instructive organizations, cognizant endeavors from the primary, educators, understudies and guardians are to be given. Sangra & Gonzalez-Sanmamed (2010) broke down the mix and utilization of ICT in the school level and inspected instructors’ discernments about the change in educating and learning procedures that can be made through the ICT use. Information gathered from four distinct sorts of schools uncovered that ICT favors a few procedures of educating and learning. ICT is thought to be an inventive factor and because of its higher commitment, the schools are coordinating ICT for enhancing the educating learning forms. Such an attainment is possible not only with upgradation of the technological infrastructure, but also with deployment of new models and techniques of teaching. Along with information transmission and knowledge facilitation, ICT favours attentiveness, perceptiveness, comprehensiveness, and responsiveness of the students in the teaching-learning processes, being the common opinion among most of the teachers.

Andersson S. B. (2006) recommended that another method called “crossing points imagining” is changing the situation for educating learning procedure and information coordinated effort between peers. The importance of a systematized ICT on scholarly advancement of the instructors can change their jobs. Present day encouraging experts are particularly sharp about the use of
different devices and systems of ICT in the instructing learning process. Machin S. et. al (2007) explained the cause-effect relationship between ICT investment and academic performance in his study conducted in the primary schools. In contrast to his previous literature surveys that could not find any benefit among the students and their related contribution to the firms, this study shows a positive effect of ICT investment towards academic performance of the students that enhances the firm’s productivity. Lynne & Nigel (2005) proposed that all pupils will be able to realize their potential ensuring that the experience gained through learning using ICT is more suitable and precise. In this respect the existing facilities are to be reinvestigated and new strategies are to be formulated to modify them. Although, the general capability of ICT can provide specialized educational tools to make learning more effective among the pupils, but the specific technology concerned to incorporate such tools are not under the purview of ICT. ICT has enormous potential for skill development among wider range of pupils. Tondeur, Valcke & Braak, (2008) through a multilevel analysis explored the combined effect of (1) teacher’s characteristics and (2) school characteristics on academic development. A mapping between school qualities and sorts of PC utilized were built up in the outcomes. The outcome additionally uncovered a mapping between educator qualities at school level and sorts of PC utilized. Johan (2001) proposed that teachers can be successful in future in using computer mediated communication (CMC) if the possibilities of CMC can bridge the teachers’ practices. From the study, although it seems that Language teachers have started using CMC, but no evidence was found regarding their upscaling of technological innovations. Integration of CMC for supportive tasks as well as teaching purposes is a big challenge for teachers. However, CMC networks may offer difficulties in the process of teaching-learning. Alam (2016) illustrated that Information and Communication Technology (ICT), being the building squares of current society, has on a very basic level changed the practices and systems of almost all types of undertaking inside scholastics and administration. The progressive change which is occurring in Data and Communication Technologies (ICTs) affect the way colleges complete their elements of instructing, learning and research, especially on the creation, dispersal and use of information. This requires a move in the conveyance and instructional method utilized in the present training framework. For India to rise as learning super power of the world, it is basic to change over our statistic leverage into information powerhouse by sustaining and sharpening our working populace into learning empowered working populace. In this manner ICT reconciliation is a requirement for building endeavors of instructive foundations. Advanced education ought not to just fundamentally think about learning situations and learning forms for understudies; they ought to likewise think about their job in making a foundation and improve long lasting learning forms. The wide appropriation of ICT calls for mentalities and range of abilities that are versatile to change. ICT in advanced education acquires a change and instructor learning conduct and creates higher request abilities, for example, teaming up crosswise over time and place and unraveling complex genuine world issues.

Youssef & Dahmani (2008) inspected the connection between the utilization of ICT and understudy execution in advanced education. Until now, financial research has neglected to give an unmistakable accord on the impact of ICT speculations on understudy’s accomplishment. The research intends to abridge the fundamental discoveries of the writing and to give two correlative clarifications. The main clarification centers around the circuitous impacts of ICT on standard informative variables. Since an understudy’s execution is principally clarified by an understudy’s qualities, instructive condition and educators’ attributes, ICT may affect these determinants and subsequently the result of training. The distinctions seen in understudies’ execution are in this way more identified with the separated effect of ICT on standard logical factors. Egoeze, Misra, Maskeliunas & Damasevicius (2018) depicts the issue of administration in advanced education, of which organization is critical, is saddled with various difficulties, thus, new methodologies
are being searched out to improve the procedure. Clearly Information and Communication Technology (ICT) is an instrument that improves managerial exercises of advanced education organization. This article depended on expressive review plan which explored the effect of ICT on the managerial administrations/administration of understudies’ records in Nigerian colleges. A poll was the exploration instrument utilized, and survey was created through an audit of related writing. A sum of 200 respondents took interest, including understudies; teachers and directors were haphazardly chosen from ten colleges in Nigeria. Information gathered was broken down utilizing ANOVA. The real effects of ICT in regulatory administrations/administration of understudies’ records in Nigerian colleges were recognized and talked about. Proposals are made on the requirement for Nigerian colleges to enlarge the extent of ICT application in authoritative administrations to completely receive the rewards of ICT. Richard (2015) illuminated that the selection and utilization of ICT in instruction positively affect educating, learning, and research. ICT can influence the conveyance of instruction and empower more extensive access to the same. Likewise, it will expand adaptability with the goal that students can get to the training paying little mind to time and topographical boundaries in the 21st century. It can impact the manner in which understudies are educated and how they learn. It would give the rich condition and inspiration for showing learning process which appears to have a significant effect on the way towards learning in instruction by offering new potential outcomes for students and instructors. These conceivable outcomes can affect understudy’s execution and accomplishment. So, more extensive accessibility of best practices and best course material in training, which can be shared by methods for ICT, can encourage better instructing and enhanced scholastic accomplishment of understudies. The general writing recommends fruitful ICT incorporation in instruction in the 21st century. Singh (2017) expressed that around the world, it has been acknowledged by everything that instruction is the greatest impetus behind the social and financial improvement of any country and its entrance and reasonableness for everyone has now made conceivable by ICT. Yet at the same time a great deal needs to be done to accomplish the coveted level of IT selection in higher training. The utilization of ICT is an image of another period in training. Other than this, ICT adjusts thought designs, gives new preparing models with the advancement of existing instructive models. In our globalizing society, the ever-expanding interest for gifted and able work has seen an exceptional blast. In this situation, the entrance to advanced education with quality is an extremely deciding component for the monetary and social improvement of the person. The utilization of ICT has upgraded separate learning and with this the instructing network can achieve the remotest territories and students are likewise getting profited from any edge of the world. It may very well be said that ICT empowered training has empowered the democratization of training.

**Conceptual Framework**

Certain factors are identified to make ICT effective for higher education.

**Accessibility of ICT**

The principal factor that is used to check the adequacy of ICT in reinforcing the procedure of advanced education framework in India is “Accessibility of ICT”. Whatever degree this variable impact in fortifying the advanced education process, respondents’ responses were assessed at five likert scale and inquiries depended on:
(1) Availability of all-around outfitted Information Technology lab in college/university.
(2) Availability of high-speed internet for IT lab and for personal devices via Wi-fi.
(3) Availability of online multimedia/video-conferencing during lectures in the classroom (Smart Classroom).
(4) Availability of advanced library in IT Labs.
(5) Availability of IT lab for 24 × 7 access within the institute premises or outside through smartphone apps.

**Usage of ICT**

The second factor that has been analysed to check the adequacy of ICT in advanced education framework in India is “Usage of ICT”. What exactly degree this variable impacts in fortifying the advanced education process, respondents’ responses were assessed at five likert scale and inquiries depended on:

(1) Usage of most recent innovation of ICT in college/university.
(2) Use of sight and sound gadget instead of Chalk and Board.
(3) Usage of web for doing assignments and activities notwithstanding ebooks/e-journals.
(4) Usage of Wi-fi in university/colleges to access information via smartphones, tablets etc.
(5) Usage of video-conferencing for live class lectures for the students who are not able to attend the class.
(6) Usage of video-conferencing for monitoring the activities of the students and teacher during the class.
(7) Usage of ICT for attendance recording system.

**Knowledge from ICT**

The third factor that has been analyzed to check the adequacy of ICT in advanced education framework in India is “Knowledge from ICT”. Whatever degree this variable impact in fortifying the advanced education process, respondents’ responses were assessed at five likert scale and inquiries were:

(1) ICT in advanced education framework gives data to work diverse gadgets.
(2) ICT in advanced education framework gives learning that would be useful at the expert level.
(3) ICT produces the gainful information to understudies identified with their investigations.
(4) ICT provides guidelines for the students who are visually and hearing impaired to use the lab facilities concerned.
(5) Announcement regarding examination, form fill-up or other upcoming events can be prompted to the incumbents via smartphone apps.
Cost of ICT

The fourth factor that has been analysed to check the viability of ICT in advanced education framework in India is “Cost of ICT”. What exactly degree this variable impact in reinforcing the advanced education process, respondents’ responses were assessed at five-point likert scale and inquiries were:

(1) IT Lab offices to the understudies bears ostensible charges as a piece of educational cost expenses.
(2) Purchase of personal computing and mobile gadgets for the students is mandatory for 24 × 7 access within the institute premises or outside.
(3) No additional charges to be paid or no special device need to be purchased by the students who are visually and hearing impaired.
(4) Availability of laptops, notebooks, smartphones, tablets at affordable price.
(5) For mobile internet attractive offers for 3G/4G data pack.
(6) Nominal operation and maintenance cost of IT labs.

Effectiveness of ICT in Higher Education System

This dependent variable uncovers that how the understudies can utilize the ICT in their course educational programs to fortify the procedure of advanced education framework in India. Respondent’s reactions were gauged on five-point likert scales and inquiries were:

(1) Due to ICT, the occupants can upgrade their learning abilities.
(2) ICT gives huge online learning storehouse to officeholders by means of computerized library and web.
(3) Use of sight and sound frameworks helps the understudies for better learning.
(4) Use of video-conferencing system for monitoring the student-teacher activities in the class and generate feedback at personal level.
(5) ICT can be utilized to upgrade instructive productivity at the nearby, territorial and national level.
1. Availability of all around outfitted Information Technology lab in college/university.
2. Availability of high-speed internet for IT lab and for personal devices via Wi-fi.
3. Availability of online multimedia/video-conferencing during lectures in the classroom (Smart Classroom).
4. Availability of advanced library in IT Labs.
5. Availability of IT lab for 24x7 access within the institute premises.

- **Accessibility of ICT**
  - Due to ICT, the occupants can upgrade their learning abilities.
  - ICT gives a huge online learning storehouse to offshorers by means of...

- **Usage of ICT**
  - Use of sight and sound frameworks helps the understudies for better learning.
  - Use of video-conferencing system for monitoring the student-teacher activities in the class...

- **Knowledge from ICT**
  - ICT can be utilized to upgrade instructive productivity at the nearby, territorial, and rational level.

- **Cost of ICT**

1. Usage of most recent innovation of ICT in college/university.
2. Use of sight and sound gadget instead of Chalk and Board.
3. Usage of web for doing assignments and activities notwithstanding ebooks/journals.
4. Usage of Wi-fi in university/colleges to access information via smartphones, tablets etc.
5. Usage of video-conferencing for live class lectures for the students who are not able to attend the class.
6. Usage of video-conferencing for monitoring the activities of the students and teacher during the class.

1. ICT in advanced education framework gives data to work diverse gadgets.
2. ICT in advanced education framework gives learning that would be useful at the expert level.
3. ICT produces the gainful information to understudies identified with their investigations.
4. ICT provides guidelines for the students who are visually and hearing impaired to use the lab facilities concerned.
5. Announcement regarding examination, form fill-up or other...
Objective of the Study

- To discover the elements impacting the adequacy of ICT in reinforcing the procedure of advanced education framework in India.

Hypotheses of the Study

- Availability of ICT is having a significant impact on effectiveness of ICT in education sector.
- Usage of ICT is having a significant impact on effectiveness of ICT in education sector.
- Knowledge from ICT is having a significant impact on effectiveness of ICT in education sector.
- Cost of ICT is having a significant impact on effectiveness of ICT in education sector.

Research Methodology

An examination configuration gives the system to be utilized a guide in gathering and breaking down information. For this investigation, the analysts have utilized Descriptive Research and the sort of research configuration is Cross-sectional. The essential information has been gathered for the examination through a pre-tried survey. Optional information is that which will be gathered from doctoral postulations, magazines; articles, valid sources and so on. In this investigation, researchers have gathered the information from different college/university of West Bengal. The places from where the data has been collected are Burdwan, Malda, Siliguri, Kolkata and Medinipur, which are renowned towns of West Bengal. The areas were selected based on the proximity of various colleges/universities there. Convenience sampling technique has been used to find out the responses from various students of schools and colleges, teaching staff and non-teaching staff. Researchers have distributed 450 questionnaires among various respondents and 386 properly filled up questionnaires have been returned to the researchers. A simple, easy to understand questionnaire consisting of close ended questions has been used for data collection from various respondents.

Analysis and Result

Validity & Reliability Analysis

The construct validity mainly contains two kinds of validity, viz. convergent validity and discriminant validity. Here between the different factors of the components are having the solid co-connection coefficient and majority of the co-connection coefficients esteems are in higher extents. Thus, here it demonstrates that the convergent validity exists. Despite there are high co-connection coefficients between the factors of a specific factor, extremely frail relationship likewise exists between the one factor variable to another factor’s variable. Here it likewise demonstrates that the discriminant validity exists.

Table 1: Overall Reliability Statistics

<table>
<thead>
<tr>
<th>Cronbach’s Alpha</th>
<th>Number of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>.891</td>
<td>23</td>
</tr>
</tbody>
</table>

Total Cases: 386

Cronbach alpha greater than 0.70 for overall and individual factor means the reliability scaling is good under various items & from the analysis it is found that the Cronbach’s Alpha result is 0.891. In spite, the esteem is well over 0.70 so the specialist can presume that the Cronbach’s Alpha outcome is adequate and as need be the analyst can continue the further examination. By the help of expert’s suggestions face validity and content validity have been executed.
Exploratory Factor Analysis (EFA) by SPSS 21 has been utilized in this examination. By the estimation and model, legitimacy test and wellness of the model have been inspected.

### Table 2: KMO and Bartlett’s Test

<table>
<thead>
<tr>
<th>Kaiser-Meyer-Olkin Measure of Sampling Adequacy.</th>
<th>Kaiser-Meyer-Olkin Measure of Sampling Adequacy.</th>
<th>Bartlett’s Test of Sphericity</th>
<th>Bartlett’s Test of Sphericity</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.847</td>
<td></td>
<td>Approx. Chi-Square: 4932.459</td>
<td>df: 213</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sig.: .000</td>
<td></td>
</tr>
</tbody>
</table>

Five different factors have been created with different items (above 0.5 factor loading) which are shown in the Rotated Component Matrix. These extracted factors explain total 74.273% of the variations. Variance explained (%) and Cronbach alpha for individual factors have been given in the following Table 3.

### Table 3: Result of Factor Analysis - Rotated Component Matrix

<table>
<thead>
<tr>
<th>Components</th>
<th>Accessibility of ICT</th>
<th>Usage of ICT</th>
<th>Knowledge from ICT</th>
<th>Cost of ICT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>0.914</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q2</td>
<td>0.883</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Q3</td>
<td>0.816</td>
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<td></td>
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<tr>
<td>Q4</td>
<td>0.772</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q5</td>
<td>0.698</td>
<td>0.842</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q6</td>
<td></td>
<td>0.814</td>
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<td></td>
</tr>
<tr>
<td>Q7</td>
<td></td>
<td>0.797</td>
<td></td>
<td></td>
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<tr>
<td>Q8</td>
<td></td>
<td>0.752</td>
<td></td>
<td></td>
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<tr>
<td>Q9</td>
<td></td>
<td>0.726</td>
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<tr>
<td>Q10</td>
<td></td>
<td>0.703</td>
<td></td>
<td></td>
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<tr>
<td>Q11</td>
<td></td>
<td>0.672</td>
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<td></td>
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<tr>
<td>Q12</td>
<td></td>
<td></td>
<td>0.836</td>
<td></td>
</tr>
<tr>
<td>Q13</td>
<td></td>
<td></td>
<td></td>
<td>0.891</td>
</tr>
<tr>
<td>Q14</td>
<td></td>
<td></td>
<td></td>
<td>0.764</td>
</tr>
<tr>
<td>Q15</td>
<td></td>
<td></td>
<td></td>
<td>0.753</td>
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<tr>
<td>Q16</td>
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<td>0.672</td>
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<tr>
<td>Q23</td>
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</tbody>
</table>

**Extraction Method:** Principal Component Analysis.

**Rotation Method:** Varimax with Kaiser Normalization.

*a. Rotation converged in 6 iterations.*
Here Accessibility of ICT, Usage of ICT, Knowledge from ICT and Cost of ICT are the four major factors extracted from the factor analysis which consist of 23 important variables. In “Availability of ICT” related factor the most influencing variable is “Availability of all-around outfitted Information Technology lab in college/school”. In West Bengal people related to higher education are also influenced by Availability of high-speed internet for IT lab and for personal devices via Wi-fi, Availability of online multimedia/video-conferencing during lectures in the classroom (Smart Classroom), Availability of digital library in IT Labs and Availability of IT lab for 24 × 7 access within the institute premises or outside through smart phone apps. In “Usage of ICT” related factor the most influencing variable is “Usage of most recent innovation of ICT in college/university” and after that other influencing factors are Use of sight and sound gadget instead of Chalk and Board, Usage of web for doing assignments and activities notwithstanding ebooks/e-journals, Usage of Wi-fi in university/colleges to access information via smartphones, tablets etc, Usage of video-conferencing for live class lectures for the students who are not able to attend the class, Usage of video-conferencing for monitoring the activities of the students and teacher during the class and Usage of ICT for attendance recording system respectively. In “Knowledge from ICT” related factor the most influencing variable is “ICT in higher education system provides information to operate different devices” and at last in “Cost of ICT” related factor the most influencing variable is “IT Lab facilities to the students bears nominal charges as a part of tuition fees.”

Now, to find out from these factors which are the most influencing factor for effectiveness of ICT in higher education, regression analysis have been used.

The four factors which have been identified from the Factor Analysis are, Accessibility of ICT, Usage of ICT, Knowledge from ICT and Cost of ICT. Here the Effectiveness of ICT in higher education has been used as a Dependent Variable and the remaining four factors have been used as Independent variables.

Table 4: Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>Durbin-Watson</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.750a</td>
<td>0.562</td>
<td>0.567</td>
<td>0.87471</td>
<td>1.782</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Accessibility of ICT, Usage of ICT, Knowledge from ICT, Cost of ICT
b. Dependent Variable: Effectiveness of ICT in higher education

Table 5: ANOVA

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
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<td>4</td>
<td>53.369</td>
<td>69.753</td>
<td>0.000b</td>
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<td>Residual</td>
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<td>381</td>
<td>0.765</td>
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</tr>
<tr>
<td>Total</td>
<td>504.984</td>
<td>385</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent Variable: Effectiveness of ICT in higher education
b. Predictors: (Constant), Accessibility of ICT, Usage of ICT, Knowledge from ICT, Cost of ICT
Table 6: Coefficients

<table>
<thead>
<tr>
<th>Model B</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
<td></td>
<td>Tolerance</td>
</tr>
<tr>
<td>(Constant)</td>
<td>1.554</td>
<td>0.255</td>
<td>6.089</td>
<td>0.000</td>
<td>0.789</td>
</tr>
<tr>
<td>Accessibility of ICT</td>
<td>0.193</td>
<td>0.047</td>
<td>0.181</td>
<td>4.123</td>
<td>0.000</td>
</tr>
<tr>
<td>Usage of ICT</td>
<td>0.267</td>
<td>0.056</td>
<td>0.224</td>
<td>4.800</td>
<td>0.000</td>
</tr>
<tr>
<td>Knowledge from ICT</td>
<td>0.073</td>
<td>0.051</td>
<td>0.065</td>
<td>1.430</td>
<td>0.000</td>
</tr>
<tr>
<td>Cost of ICT</td>
<td>.412</td>
<td>0.042</td>
<td>0.411</td>
<td>9.802</td>
<td>0.000</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Effectiveness of ICT in higher education

Multi-collinearity has been checked through Variance Inflation Factor (VIF) which should be under 3 for agreeableness run. Here all VIF esteems are in adequate range and it presumes that the factors are free from multi-collinearity.

0.750 is the Correlation coefficient (R) for Model 1, it underscores a measure of connection between the autonomous factors and variable (Effectiveness of ICT in advanced education). The R square 0.562 or 56.2% which is very noteworthy. Here the criticality level additionally suggests 0.000 centrality level which implies it is very adequate.

From the coefficient table, the specialists have discovered that Cost of ICT factor is having most elevated un-institutionalized B estimation of 0.412 with most noteworthy t value 9.802. So Cost of ICT is the highest influencing factor on Effectiveness of ICT in higher education. After that the second most elevated will be Usage of ICT with the B estimation of 0.267 and t estimation of 4.800. Accessibility of ICT is the third highest with un-standardized B value of 0.193 and knowledge from ICT is following after that.

It is also evident from the result that all the independent variables; Accessibility of ICT, Usage of ICT, Knowledge from ICT and Cost of ICT are statistically significant and all the variables are below 0.01, which means all are statistically significant at 1% significance level. Though it is statistically significant, so the hypotheses are explaining that null hypotheses have been rejected in all the cases and alternate hypotheses have been accepted. Along these lines, the multiple regression equation can be communicated as,

\[
\text{Effectiveness of ICT in Higher Education} = 1.554 + .193 X_1 + .267 X_2 + .073 X_3 + .412 X_4
\]

[Where, Accessibility of ICT = X_1, Usage of ICT = X_2, Knowledge from ICT = X_3, Cost of ICT = X_4]

Findings and Conclusion

The discoveries for Effectiveness of ICT in Higher Education Model clarifies that all the free factors Availability of ICT, Usage of ICT, Knowledge from ICT and Cost of ICT are measurably huge and have a solid positive effect on viability of ICT. It is additionally obvious from the exploration that, Cost of ICT is the most noteworthy impacting factor on Effectiveness of ICT in advanced education and utilization, accessibility and learning are following that.

It tends to be inferred that ICT in instructing can support a few procedures identified with educating and learning through transmission of data and assistance of information. ICT makes
educating and learning process less demanding on the record of being broad and orderly and in this manner fundamental abilities can be produced to take additional profit of the same. In such manner, it ought to be thought about that change in the learning results is by and large connected with the utilization of imaginative mechanical practices in training. It is normal that an easy to understand and proper condition can be produced in the schools, establishments and colleges by the instructors and managers to expand the utilization of ICT.

ICT likewise centers change of the educators’ job during the time spent on advanced education where notwithstanding classroom instructing, different abilities and obligations of the instructors would lead them to go about as virtual aides for understudies utilizing electronic media. The learning encounters of understudies will be upgraded using ICT that would likewise make them energetic in deduction freely and imparting inventively. The understudies can assemble fruitful vocations and lives, in an undeniably focused world. Quick changes in the innovations are demonstrating that the job of ICT in future will develop massively in the training. Accordingly, the job of ICT in the training is repeating and unavoidable. It may very well be reasoned that the way ICT is utilized during the time spent on advanced education framework can be a key achievement factor for development, instructing and change of learning forms which can inspire the educators, chairmen and understudies.

Future Scope of the Research

- The capability of the cutting-edge data and correspondence advancements must be misused keeping in mind the end goal to broaden the extent of essential instruction towards avoided and underprivileged gatherings; and change in classroom educating.
- To supplant inflexible, costly and socially alienating scholarly structures with savvy conveyance frameworks that are more expanded, better adaptable and generally satisfactory with long haul consistency in quality.
- To make advanced education administrations open to everything that incorporates the poor, ignorant grown-ups, youngsters outside the educational system, extra important administrations are to be produced through a methodology that includes both the formal training framework and every conceivable option offered by the non-formal division. A definitive point is to make the higher instruction framework free from different types of special case and segregation.

These are the methods for building up a real instructive framework that can be open to financial, progressive and all-around satisfaction. Every individual will be furnished with the keys to enhanced and practically perpetual learning through such framework.

References


Authors’ Profile

Debarun Chakraborty is working as an Assistant Professor in Haldia Institute of Technology, Haldia, West Bengal, India. He did his BE in Chemical from VTU Belgaum, Karnataka, India, MBA in Marketing from IEM Kolkata (MAKAUT), West Bengal, India qualified UGC NET in Management (twice) in June 2012 & December 2012 & completed Ph.D. in Management from Vidyasagar University, Midnapore, West Bengal, India. He has rich cross functional exposure across various organizations in India for more than 10 years with 8 years in academics & 2 years in industries.

Soumya Kanti Dhara is working as an Assistant Professor at Haldia Institute of Technology (HIT), Haldia, West Bengal, India. His areas of academic interest include Information Technology Management, Production & Operations Management, Database Management Systems, Networking, E-Commerce, Project Management, Consumer Behavior and Advertising & Sales Promotion.

Adrinil Santra is having 10 years of teaching experience and has served in various premier institutes and universities of India. He started his career at TexCorp Pvt. Ltd and subsequently served various other companies like Windflower Hall and Sify.com. He started his teaching career at Christ College, Bangalore and is currently serving Haldia Institute of Technology, Haldia, West Bengal, India in the Department of Management and Social Science.