Enhancing Quality of Education through Information and Communication Technologies

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Abstract – Information and Communication Technology has become an imminent need of today's society. ICT is now considered as the core of education system. It is an assurance for bringing the 'quality' factor in the existing education system. ICT increases the level of accessibility and availability for the students. In this paper, reasons for ICT introduction and how to implement it is explored. Also, setbacks associated with ICT are also discussed, so that it does not overpower other key elements of education system. Conclusively, this paper suggests that application of ICT will improve quality in any of the educational institute.

Keywords- ICT, Education Quality

I. INTRODUCTION

Education is an assortment of activities which imparts knowledge, skills and an appropriate attitude in students' life. It is an amalgamation of learning and following progressive instructions. The activities contained by the education system are structured in such a manner that it provides students with adequate amount of learning in feasible time frame. This structure is modified and exercised in accordance with the requirements of educational group. The problem here is that how to inject quality in the already established education system. A solution to this problem is presented in this paper.

ICT[1] is a term encompassing usage and services of technology and devices, including telecommunications' devices and computers. It covers corners of existing world's dynamics. Competencies of ICT are followings:

- Assistance in critical thinking.
- Aids in expertise knowledge of selected domain
- Assistance in decision making
- Handling dynamic situations
- Effective communication

Hence, ICT goes through all the barriers of cities, states and countries. Injection of ICT in existing Education system is prospected to improve its various dimensions' quality. Following are the dimensions of education which gets affected positively by ICT:

- Students' learning
- Teachers' outcomes
- Community's involvement
- Economic development
- Collaborative work environment and communication
- Global competition and collaborations
- Reporting and evaluation assistance

ICT enriches the education system through technical improvement and making learning resources ubiquitous. In the current scenario it is used to assist students' learning and by providing teachers with a wide range of pedagogies for quality education. Along with this, the emerging technologies are also helping teachers to do administrative work more efficiently. Subsequently, introduction of ICT in the education system is a win-win situation for all the associated ends.

ICT in education system will improve the education quality by increasing the accessibilities of resources and abilities of its users. However, one could not avoid the drawbacks of ICT. In this paper an exploratory study is conducted over ICT and its implementation in education system.

Education and quality goes hand in hand, as it is a way to enhance students' eminence. Before improving student's quality, advancement is required in the procedure followed for educating them. This will certainly aid the present education system. Often it has been stated that learning improves one's knowledge. However, in the context of improving quality of education, there is a realization of gap between learning and implementing. This gap could be abridged through ICT implementation.

This paper is prearranged in the following way. The next section describes the reasons for ICT introduction in the education sector. Section III describes a suitable approach for ICT introduction in education sector. Section IV reflects the drawbacks associated with ICT. Section V throws light on few of the implementation of ICT and section VI concludes that how ICT helps in Quality improvement of education system.

II. RATIONALES FOR ICT INTRODUCTION

Education is the motivating force of economic and social development in any country (Cholin, 2005; Mehta and Kalra, 2006). Considering this, it is essential to find ways to make education of good quality, accessible and affordable to all, using the most recent available technologies. The problems before the Indian education system have following identified nature:

1) *Access to education:* There exist communications, socio-economic, linguistic and physical barriers for people who aspire to access education (Bhattacharya and Sharma, 2007).
2) *Education Quality:* This includes the nature of education provided at various institutions.
3) *Allocated resources:* Central and State Governments reserve about 3.8% of GDP for education as compared to the 6% that has been aimed (Ministry of Human Resource Development, 2015).

The nature of education makes it more complex to achieve the level of quality which it requires. Resources allocated for education by our nation has been increasing year by year. However, still much is required to be done for quality education. ICT aims to increase the resources and decrease the limitations of education. Table I represents the reasons for introduction of ICT in the education system.

[1] Information Communication and Technology

TABLE I

S. No	Rationale	Basis
1	Social	Education increases the strength of society and technology increases the strength of education.
2	Vocational	Technology prepares the students for their respective jobs in future
3	Catalytic	Using technology in improving The traditional ways of teaching and managing.
4	Pedagogical	Implementing technologies in improving learning and adding flexibility in curriculum delivery

Society requires education for uplifting its strength and increasing its awareness; technology acts as a helping hand for fulfilling these purposes. Education prepares a student for future endeavors. But there exist no such way to promise a student with required skills and techniques, which will assist them in exiting working environment. ICT prepares students vocationally for the challenging work environments. ICT acts a catalyst for the traditional teaching methodology. It also further helps in managing academic records and data efficiently. Pedagogy is impressively improved by using technologies which helps in lectures delivery easy and also makes everything flexible.

All these explained rationales progress education qualitatively. Another prominent reason for ICT introduction is advancement towards excellent accessibility. Earlier, data and resources were available in libraries. Accessing these resources was complicated and lengthy. Nowadays, academic and intelligent resources are in reach of students. Teachers also gain a ton by accessing data from ICT technologies.

A. ICT Tools

The available ICT tools in educational field are divided into three classes:

1) *Input Source:* These are the technologies which take some document or any other sources as input. For instance, a visualiser takes a transparent slide or any other document as the input source, capture its image and display it to larger audience.
2) *Output Source:* Unlike input source technologies, these are used for outsourcing the input document and presentation. For instance, a projector is used to display an image onto a surface.
3)

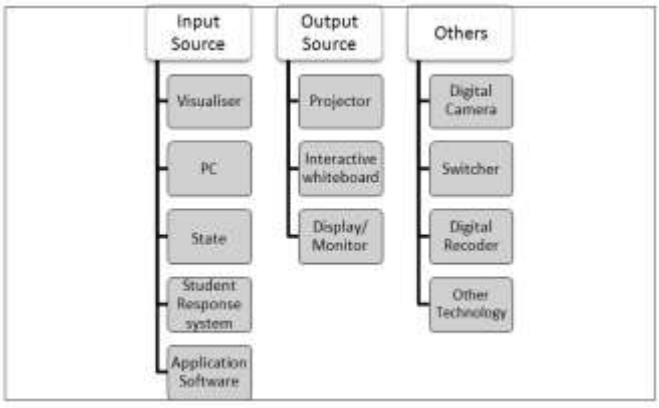

Figure 1. ICT Tools

4) *Others:* Any technologies other than the above stated comes under this class.

Study has shown that ICT can guide to improved student knowledge and better teaching techniques. An increase in student exposure to educational ICT through curriculum integration has a significant and positive impact on student achievement, especially in terms of Knowledge and Comprehension, Practical and Presentation skills in subject areas.

B. Beneficiaries of ICT

Introduction of ICT has benefited various sections of education system. The most prominent beneficiaries are:

1) *Student:* They are most likely to get benefited through ICT. In terms of quality improvement of their learning procedure, they get easy availability and accessibility to existing resources. Their skills improve majorly by various technical enhancement techniques of ICT.
2) *Employer:* ICT is a huge benefit for the employers of any organization, financially and qualitatively. Resources are easy to avail and at lower costs. Their employees improve skills along with increase in productivity. An excellent environment is established with the help of ICT.
3) *Government:* At the top is the government who gain a lot through ICT. The money allotted and invested for education is efficiently utilized through ICT. Targeted groups are reached and the existing educational structure is improved. It also promoted innovation and ideas along with connecting educational organization to latest emerging technologies.

Table II represents all the stakeholders and their respective profits.

TABLE II

S. No.	Stakeholders	Profits
1.	Student	• Accessibility • Flexibility • Skill improvement • Centered learning • High quality education
2.	Employer	• Workplace Development • New learning culture • Employee skill development with increased productivity
3.	Government	• Cost effectiveness of education system • Target group reach ability • Improvement of existing educational structure • To ensure the connectivity of educational organizations to latest emerging technologies • Promotion of innovation and ideas

III. ICT IMPLEMENTATION APPROACH

ICT implementation needs an appropriate approach beforehand. It should be implemented in the context of underlying national regulations. An approach for implementing ICT, at any of the education institution, consists of following stages:

1) *Stage I: Underlying government's national goal fulfillment:* As there already exist national goals regarding ICT introduction and its evolvement, so its implementation must abide by them.

2) *Stage II: National goal analysis:* The broad national goals are analyzed to understand the needs of curriculum. Along with this, learning outcomes will be decided beforehand.
3) *Stage III: Curriculum design and development:* The curriculum is designed on the basis of earlier step. This design must fulfill the pedagogy requirement of the institution and encourage innovation and creativity.
4) *Stage IV: Identification of technologies to fulfill the demands of curriculum:* After the design of curriculum, required technologies for its fulfillment is either developed or brought. This technologies are then evaluated and most suitable of them are selected for the curriculum. This is then followed by design of teaching and learning.
5) *Stage V: Build the capacities of involved teaching and administration staffs:* The competency of all the involved stakeholders are improved in accordance with the technologies in use for better learning outco9mes.
6) *Stage VI: Implementation of the program:* Implementation of ICT initiatives including deployment of hardware and software at the institution.
7) *Stage VII: Periodic monitoring and maintenance of the ICT program:* After implementation, periodic monitoring of the initiative is required to introduce areas of improvement.

Above seven stages is for implementing ICT at any of the educational institute. These stages could be mould in accordance with the ICT requirements.

IV. DRAWBACKS OF ICT

Although ICT is introduced to improve the quality and accessibility of education, there are few drawbacks which could be recovered through proper mechanism. Following are these drawbacks:

1) *Missing Teachers' Expertise:* As not all teachers are expert with ICT handling, so they may lag in uploading updates of the coursework in their respective hands. This could delay the procedure of learning from students' side.
2) *Digital deviation within the class:* There are cases where students are not much technology savvy. Hence, students who have digital knowledge could gain more from ICT than others. This could lead to unnecessary knowledge deviation within the class.
3) *Primary Goal deviation:* the primary goal of education is learning and being fit for survival in the society. However, this goal is hampered if ICT is privileged over it. This shift from primary gal needs avoidance.
4) *Increase in Plagiarism:* Students may start to misuse the availability of information through ICT. This will lead to high Plagiarism rate and less amount of innovation.
5) *Teacher-student relationship:* ICT can decrease the bonding process between teachers and students. After ICT introduction, it will become the primary mode of communication and face-to-face communication will be less preferred.
6) *Training need:* ICT give rise to the need of training for all the stakeholders associated with ICT.
7) *Cost impact:* Cost of software and hardware could be very high.

These drawbacks of ICT will be recovered if the implementation procedure is followed with extreme care. Nevertheless, ICT is a booming factor for increasing availability and accessibility.

V. ILLUSTRATIONS

In India, various reforms has been suggested and implemented in the existing education system. One of such implementation was of introduction of ICT. ICT holds a rightful place in improving quality of education. Various cases of ICT introduction and its impact have been discussed in the following section.

ICT in schools has been a component of Rashtriya Madhyamik Shiksha Abhiyan (RMSA) which has been launched in 2004 and revised in 2010. it consists of establishment of smart classes, teacher training and motivation sessions, and computer aided education in classes [1].

"SAKSHAT" a One Stop Education Portal has been launched by MHRD which is content website for all the available subjects in every discipline [2].

Brihaspati, an open source e-learning platform, (developed by IIT, Kanpur) for the purpose of distribution of study materials to students [3].

Spoken Tutorial is an initiative of national mission on education through ICT by MHRD. Its aim is to improve IT literacy through open source software. [4]

In the budget 2017, two initiatives of ICT by government have been introduced. These initiatives are Swayam and Massive Open Online Courses (MOOC) for the purpose of skill development and increasing employability [5].

The above are few of the numerous ICT implementations in our nation. Government is taking various measures to empower education qualitatively through ICT tools and technologies.

VI. CONCLUSION

Social and economic changes are way to improvement. These changes, however, require new skills and capabilities. ICT is a method through which education can be enhanced. There are various factors which affects ICT, including national policies and undertaking institutes behavior. If it is not taken leniently, then it is supposed to improve quality of education.

ICT impacts various aspects of any education system, namely, delivery, accessibility, flexibility, teaching methodologies, learning methodologies, skill development, etc. All these in turn improve quality of education. In this paper, drawbacks of ICT are also highlighted, which needs to be mitigated accordingly so that ICT emerges as strength of education system. The social-vocational-catalytic-pedagogical rationales highlight the reasons for ICT introduction. Conclusively, wide availability of learning resources and technical adaptability leads to positive outcomes of the education system. At the very end, what matters are the results obtained from any new endeavor. Subsequently, ICT promises positive results and ensures quality of education.

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