International Journal of Engineering Technology and Applied Science
(ISSN: 2395 3853), Vol. 10 Issue 4 April 2024

SANT HIRDARAM GIRLS COLLEGE, BHOPAL

Lake Road Sant Hirdaram Nagar, Bhopal, Madhya Pradesh 462030

Paper ID: IJETAS/April/2024/07

International Journal of Engineering Technology and Applied Science
(ISSN: 2395 3853), Vol. 10 Issue 4 April 2024

THE INTEGRATION OF ICT RESOURCES IN EDUCATION

Chetna Devkar
Govt. Women's Polytechnic College, Shivaji Nagar, Bhopal.Department of Computer Science & Engineering, Bhopal (M.P), India

ABSTRACT

In many countries, education is more than a means for enabling progress and avoiding poverty, it is also critical for the development of knowledge societies and knowledge-based economies. It has been suggested that information and communication technologies (ICTs) can play a number of roles in education. Although lessons may be learned from best practices around the world, there is no specific or best formula for determining the best level of ICTs integration in the Education. Many researchers suggested that the role of higher education institutions within the context of knowledge-based economies and globalization is to provide individuals the ability to transform information into socially beneficial knowledge, skills, and value, modernize societies and improve the standard of living. This paper examined some key challenges faced by the higher education institutions (HEIs) in integrating information and communication technologies (ICTs) into teaching and learning. This paper argues also that the main purpose of integrating ICTs in education is to provide extra approaches that can be used to address the serious environmental, cultural and educational challenges faced by policymakers, educators, educational administrators and students in higher education. The paper concludes by providing some essential elements that can be used in integrating ICTs use in education.

Keywords: Education, HEIs, ICT, ICTs integration.

I. INTRODUCTION

A The primary point that draws attention in the process of the integration of Information and Communication Technologies (ICT) should be the broadness of concept of integration itself and the variety of definitions related to ICT integration. This variety should encompass a broad framework from a point of view that regards it sufficient to use ICT in lessons, to; the point of view according to which this process should be routine, permanent and should contribute to the learning process of the student. However, the definition of ICT integration in a broad framework should encompass the permanent use of ICT in the classroom to improve student learning. "A general term used to describe any technology that helps to produce, manipulate, store, communicate, or disseminate information. IT refers to the most expensive, complex computers, with devices usually dealing with electronic data in binary format. However, these IT machines are not able to communicate with one another. "And, Communication Technology (CT) is "the term used to describe telecommunications equipment through which information can be sought and accessed". (New Zealand MOE, 1998). Examples include: video conferencing, teleconference phones, and modems.

Fig 1.1 Information and Communications Technologies (ICT)

Globally, educational systems are adopting new technologies to integrate ICT in the teaching and learning process, to prepare students with the knowledge and skillsthey need in their subject matter. In this way the teaching profession is evolving from teacher-centered to student-centered learning environments. "ICT integration is understood as the usage of technology seamlessly for educational processes like transacting curricular content and students working on technology to do authentic tasks" (Kainth and Kaur). Nowadays ICT facilitate not only the delivery of lessons but also the learning process itself.

1.1 The Impact of ICT on education

In educational context, ICT has the potential to increase access to education and improve its relevance and quality. Tinio (2002) asserted that ICT has a tremendous impact on education in terms of acquisition and absorption of knowledge to both teachers and students through the promotion of:

- Active learning: ICT tools help for the calculation and analysis of information obtained for examination and also students' performance report is all being computerized and made easily available for inquiry. In contrast to memorization-based or rote learning, ICT promotes learner engagement as learners choose what to learn at their own pace and work on real life situations' problems.

Fig 1.2 school-computer-lab-clipart

- Collaborative and Cooperative learning: ICT encourages interaction and cooperation among students, teachers regardless of distance which is between them. It also provides students the chance to work with people from different cultures and working together in groups, hence help students to enhance their communicative skills as well as their global awareness. Researchers have found that typically the use of ICT leads to more cooperation among learners within and beyond school and there exists a more interactive relationship between students and teachers (Grégoire et al., 1996).

- Evaluative learning: Use of ICT for learning is student-centered and provides useful feedback through various interactive features. ICT allow students to discover and learn through new ways of teaching and learning which are sustained by constructivist theories of learning rather than

students do memorization and rote learning.And a mentioned in "Teaching of ICT" by MIE/IGNOU (2005), improvements in

1.2 The Information SocietyActive

- Activities prescribed by teacher
- Whole class instruction
- Little variation in activities

Collaborative

- Individual
- Homogenous groups
- Everyone for him/herself

Creative

- Reproductive learning
- Apply known solutions to problems
- Productive learning

II. LITERATURE SURVEY

Aksal, F. A., & Gazi, Z. A. (2015) – Information and communication technologies (ICT) are accepted as enhancing learning as regards the diffusion of knowledge in digital age. However, it is still a problem in developing countries which adaptation process takes time to integrate ICT in education system. Although literature pays attention on evidence of learning outcomes upon ICT practices in learning process, this study aims to reflect critical analysis on ICT in special education. Diifculty of traditional practices, infrastructure and specialisation in the field can be listed as obstacles in ICT integration in special education for developing countries upon documents and interviews results. The critical success factor of ICT integration in special education is the digital literacy which need to be resolved and considered within the system. [01]

Peeraer, J., & Van Petegem, P. (2011).It is clear that important conditions for successful ICT integration are met in Vietnam. At this stage, access to computers is not a main barrier, even though it seems that personal access to a computer in the teacher education institution only implies that the computer is used for other purposes than teaching. Personal access to a computer in the teacher education institution even results in lower use of ICT for teaching practice (b ¼ .099). As described in other research it could be that many teachers own and use computers for their own administrative work, but never use them in their classrooms (Watson, 2001). Analysis of the technology plans for the different institutions revealed moreover that access to teaching technologies such as a data projector and a screen is currently limited. Increased personal access to computers for teaching staff and access to teaching technology could make a difference.[02]

Wang, Q. (2008). –Pedagogy, social interaction and technology are three key components of a technology- enhanced learning environment. A sound design of these components should enable teachers to integrate ICT into teaching and learning in an effective way. Naturally, pedagogy and social interaction are the central focus of a learning environment, and technology provides essential support.The generic model fits well with constructivist learning theories, interactivity design and the definition of the usefulness of a system. Consequently, the pedagogical design of a learning environment can follow the cognitive constructivist learning theory to include basic educational functionalities by focusing on interaction with content. The social design can follow the social constructivist learning theory to provide a comfortable learning space in which students can interact with peers or the teacher. The technological design must ensure the usability of the learning environment by focusing on interaction with the interface.[03]

Haslaman, T., Kuskaya-Mumcu, F., & Kocak-Usluel, Y. (2008, June)–The purpose of this study is to develop a unified model for the integration of ICT resources and applications into teaching-learning processes. With the help of this study, the integration process will gain clarity and thus students will strengthen their learning. In addition, an integration scale is planned to be developed as the continuation of this study. All the structures formed under the guidance of the questions in the model are taken into account both individually and as a whole. Therefore, it is also important for the

continuity of the process; the observation and evaluation processes to deal with the contexts formed in this manner. [04]

III. IMPACT OF ICT ON LEARNERS

The ICT has very strong effect in education and it provides enormous tools for enhancing teaching and learning. There have been many studies that have highlighted the various ways that ICT may support teaching and learning processes in a range of disciplinary fields such as the construction of new opportunities for interaction between students and knowledge and accessing information.

Fig 3.1 ICT on Learners

The five ways to establish and sustain effective learning environments through ICT suggested by the Committee on Developments in the Science of Learning (2000) are:
1. Real world problems
2. Scaffolding
3. Feedback, reflection and guidance
4. Local and global communities
5. Extending teacher learning. (Newhouse, 2002)

3.1 IMPACT OF ICT ON TEACHERS

Roblyer and Edwards (2000) suggested that there are five important reasons for teachers to use technology in education:
(1) Motivation;
(2) Distinctive instructional abilities;
(3) Higher productivity of teachers;
(4) Essential skills for the Information Age and
(5) Support for new teaching techniques (Samak, 2006).

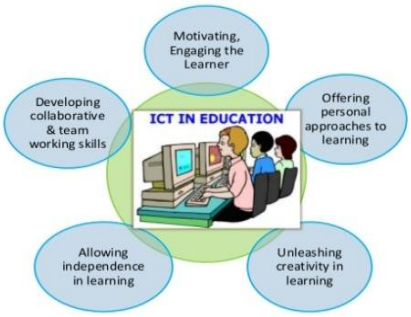

Fig 3.2 ICT a Focus on the learner

In order to make use of technology in the classroom effectively, educators should have a positive attitude toward technology and they should be trained in using the modern technologies in their respective field of education. Chin and Hortin (1994) stated that teachers must act as the "change agent" in the relationship between technology and the students as teachers are more likely to implement the recommended and proposed changes concerning ICT in education.But at the same time there are

many challenges faced by educators as they consider how best to best incorporate ICT tools into their teaching. This is being discussed in the following article.

3.2 FACTORS AFFECTING TECHNOLOGY INTEGRATION IN TEACHING AND LEARNING

Talks about the enormous challenge teachers are facing in our society due to the rapid expansion of knowledge. The modern technologies are demanding that teachers learn how to use these technologies in their teaching. Hence these new technologies increase the teachers' training needs. Gressard and Loyd (1985) asserted that teacher's attitudes toward computers are a key factor in the successful implementation of ICT in education. They pointed out that teachers do not always have positive attitudes towards computers and their poor attitudes may lead to a failure of the computer- based projects.
Also the most commonly cited barriers are:

- lack of time
- lack of access
- lack of resources
- lack of expertise and
- lack of support (Butler and Sellbom, 2002, Leggettt&Persichitte, 1998).

Another barrier given by Butler and Sellbom (2002) and Chizmar & Williams (2001) is reliability. Reliability included hardware failures, incompatible software between home and school, poor or slow internet connectivity and outof date software which are available mostly at school while the students/educators are having more up-to-date software at home.

3.3 ICT AND MATHEMATICS

There are many potentials uses for computers in the teaching and learning process of mathematics. According to Old know and Taylor (2000), the role of ICT in the teaching and learning process of mathematics are as follows:
In terms of teachers, the use of ICT: -

- Improves their efficiency
- Reduces their administrative burden since less paperwork
- Releases more time to address students individually
- Provides better records of students' progress
- Improve their test and examination results since they learn by own pace and learn through feedback provided to them.

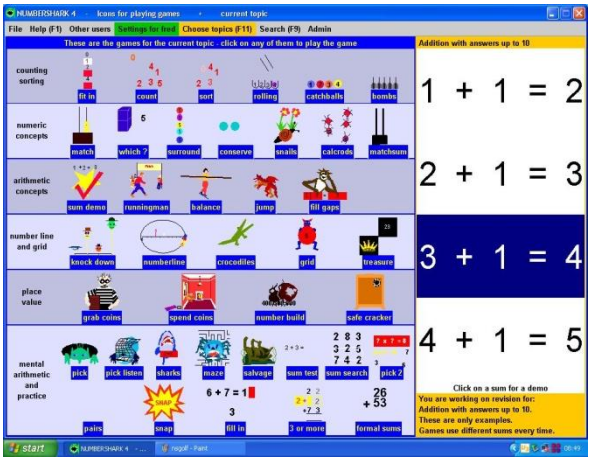

Fig 3.3 ICT And Mathematics

Mathematics lessons are associated with real life situations and increases the relevancy of the lessons to the real world. The curriculum needs to be updated continually to take account of the technology prevalent in society. Mathematics has tended to be very abstract while most students tend to operate on a concrete level. The use of concrete materials in some lessons is useful but often not convenient. The

computer can provide experiences with virtual concrete materials. In approaching problems associated with remedial and extension students' computer use can provide appropriate material and overcome classroom management problems.

IV. UNDERLYING ICT INTEGRATION IN SCHOOL EDUCATION

Principles underlying ICT integration in schooleducationIt is important to discuss the principles underlying this exercise, since these would infl uence the direction andthe priorities for the investments in ICT integration. These principles are the bas is on which assumptions forprogram design have been made. 6.1 Situating ICT firmly within education.The aim of ICT implementation should be to support the achievement of educational aims, n othing more and nothing less. While this may seem obvious, the history of ICT implementation has oft en seen a disproportionatefocus on technological aspects, which have compromised educational possibi lities.

Education is complex and multidisciplinary and a deep understanding of the aim, philosophies, context s, needs and priorities of education is necessary for a meaningful and effective design of ICT programs in education. Hence, it is critical that ICT policy/ program design be shaped by educationists, and not b y technology companies / or the IT business sector.

V. CONCLUSION

The timing has never been better for using technology to enable and improve learning at all levels, in all places, and for people of all backgrounds. From the modernization of E-rate to the proliferation and adoption of openly licensed educational resources, the key pieces necessary to realize best the transformations made possible by technology in education are in place.

REFRENCES

[1.] Aksal, Fahriye Altinay, and Zehra Altinay Gazi. "Examination on ICT Integration into Special Education Schools for Developing Countries." *Turkish Online Journal of Educational Technology-TOJET* 14.3 (2015): 70-72.

[2.] Peeraer, Jef, and Peter Van Petegem. "ICT in teacher education in an emerging developing country: Vietnam's baseline situation at the start of 'The Year of ICT'." *Computers & Education* 56.4 (2011): 974-982.

[3.] Jimoyiannis, Athanassios. "Factors determining teachers' beliefs and perceptions of ICT in education." *Encyclopedia of information communication technology*. IGI Global, 2009. 321-334.

[4.] Wang, Qiyun. "A generic model for guiding the integration of ICT into teaching and learning." *Innovations in education and teaching international* 45.4 (2008): 411-419.

[5.] Haslaman, Tulin, Filiz Kuskaya-Mumcu, and Yasemin Kocak-Usluel. "Integration of ICT into the teaching-learning process: Toward a unified model." *EdMedia+ Innovate Learning*. Association for the Advancement of Computing in Education (AACE), 2008.

[6.] Wang, Qiyun. "A generic model for guiding the integration of ICT into teaching and learning." *Innovations in education and teaching international* 45.4 (2008): 411-419.

[7.] Tondeur, Jo, Johan Van Braak, and Martin Valcke. "Curricula and the use of ICT in education: Two worlds apart?." *British Journal of Educational Technology* 38.6 (2007): 962-976.

[8.] Samuel, Robinson, and Zaitun Bakar. "The utilization and integration of ICT tools in promoting English language teaching and learning: Reflections from English option teachers in Kuala Langat District, Malaysia." *International Journal of Education and Development using ICT* 2.2 (2006): 4-14.

[9.] Bryderup, Inge M., and Kazimierz Kowalski. "The role of local authorities in the integration of ICT in learning." *Journal of Computer Assisted Learning* 18.4 (2002): 469-479.