

Impacts of ICT Integration in the Higher Education Classrooms: Bangladesh Perspective

Sabbir Ahmed Chowdhury^{1*} ASM Shamsul Arefin² Md. Mizanur Rahaman³

1. Assistant Professor, Institute of Education and Research (IER), University of Dhaka, Dhaka – 1000,
Bangladesh

2. Lecturer, Department of Biomedical Physics & Technology, University of Dhaka, Dhaka – 1000, Bangladesh

3. Assistant Professor, Department of Microbiology, University of Dhaka, Dhaka – 1000, Bangladesh

Abstract

For the last few years, ICT integration in education has been the topic of discussion for researchers. Very few researches have been conducted on ICT integration in the context of higher education, especially in Bangladesh. The purpose of this study is to explore the ICT integration in higher education teaching - learning in Bangladesh. This study is qualitative in design. Data were collected from students and teachers in the University of Dhaka through semi-structured interview schedule, focused group discussion and classroom observation schedule. The major findings of this study reveal that ICT is not integrated effectively in higher education teaching-learning. Furthermore, several obstacles have been identified that impede the effective integration of ICT. The obstacles are teachers' lack of knowledge and skills, teachers' lack of time to take preparations for class, lack of adequate equipment and access to internet and inadequate technical support. It is asserted that proper teachers' training about integrating ICT in education will be able to change the scenario to a great extent. This study has, therefore, implications for policy developers, teachers and students of various departments.

Keywords: ICT, Pedagogy, Social Interaction, Technology, Teaching – learning.

1. Introduction

ICT stands for Information and Communication Technology. According to Blurton, ICT is defined as a varied combination of technological equipment and resources for the purpose of information creation, management, communication, dissemination and storage (Blurton, 1999). Technologies included in ICT are - radio, television, video, DVD, telephone (land line and cellular), satellite systems, computer and network hardware and software as well as the equipment and services associated with these technologies such as video-conference, email and blogs (UNESCO, 2007).

The term “integration” is often used interchangeably with the word “use”. However, ICT integration in educational system is performed with the intention of bringing up a change in pedagogical approach in order to make ICT more central to teaching-learning (Lloyd, 2005). This implies that only installing ICT tools in classrooms does not ensure ICT integration but the effective use of ICT which brings positive changes in traditional teaching-learning approaches will ensure effective ICT integration. In addition, successful integration of ICT facilitates innovative culture, student-centered pedagogical goals and collective learning (Lloyd, 2005).

Government of Bangladesh (GoB) has formulated revised ICT Policy in 2015 in order to harness its power to bring changes in various fields including governance, education and research, healthcare, environment, climate and disaster management etc. To boost use of ICT in higher education in Bangladesh, GoB has installed computers, LAN, reliable high speed internet connectivity in the tertiary level educational institutions bearing in mind to produce effective professionals capable to access the global knowledge resource. Effective integration of ICT in teaching-learning will enhance students' construction of knowledge, establish a student-centered learning environment and promote independent learning. There are several frameworks which explains how to integrate ICT in teaching-learning effectively. However, while working at the university, we observed that most of the teachers used text-based digital content with traditional teaching-learning approach. Most of the teachers perceived ICT integration as using technologies in classroom with no changes in their traditional approach of teaching. This lack of understanding of teachers about ICT integration resulted in the failure to upgrade the quality of teaching-learning in higher education level.

To the best of our knowledge, very few researches have been conducted on ICT integration in the context of higher education in Bangladesh. This study aims to fill the gap in the literature. By exploring this issue, the research can inform the policy-makers, curriculum developers, teachers and other stakeholders about the changes in teaching-learning that ICT integration brings in higher education level to understand the level of implementation of ICT policy in the field of education and research.

2. Purpose statement

The study had two major purposes: to determine how teachers integrate ICT in teaching-learning effectively and to explore the changes in the teaching-learning of higher education after ICT integration. The study also tried to find out the obstacles which hampers the effective integration of ICT and recommended some suggestions to

overcome this situation. The following research questions were devised to address the above purposes of the study:

1. To what extent do the teachers integrate ICT effectively in the classrooms of higher education level?
2. What are the obstacles that impede the effective integration of ICT?
3. How can the obstacles be overcome to ensure effective ICT integration in teaching-learning?

3. Conceptual Framework of ICT Integration

Wang proposed a generic model of ICT integration having three components: pedagogy, social interaction and technology (Wang, 2008). These components as in Figure 1 are found in any learning setting and sound design of these elements should ensure effective ICT integration.

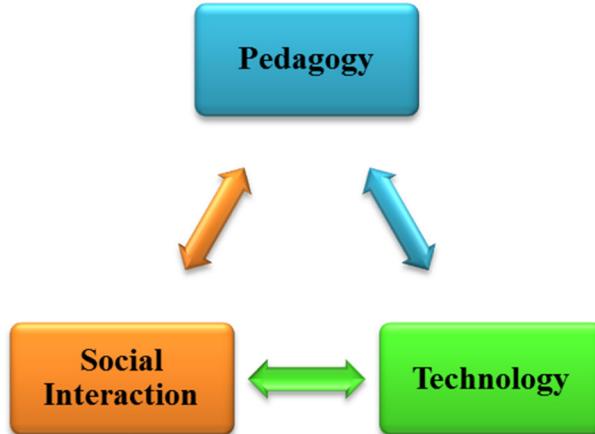


Figure 1. Key components of the generic model (Wang, 2008).

All these components together form a constructivist learning environment. The components can be present in a traditional classroom situation and it would still be aligned with constructivist learning. All these three components have some characteristics and if the characteristics are present in a classroom situation, it can be said that the component is present and the integration of ICT has been effective.

3.1 Pedagogy

Pedagogy is generally referred as the strategies, techniques or approaches that teachers apply to facilitate learning in an educational context (Wang, 2008). A constructivist pedagogical design is designed according to the needs of the learners and scaffolds them during learning. The constructivist pedagogical design enables the students to achieve learning objectives through the development of knowledge based on their prior experiences (Kirschner, Strijbos, Kreijns, & Beers, 2004).

3.2 Social interaction

Learning is a social process in which learners collectively construct knowledge through sharing, negotiating and modifying the information in a group (Gunawardena, Lowe, & Anderson, 1997). The social interaction includes interactions between learner-learner and learner-instructor. In order to promote social interaction the following specifications need to be incorporated:

- Group work needs to be introduced for enhancing social interaction, in which group members could share information, discuss questions and work.
- A seminar room for online discussions is another specification for ensuring social interaction.
- A Q/A forum needs to be set up, in which the learners could interact with among themselves and the teacher. Interactions may be in the form of posting of general questions, answers or comments regarding the course design, assignments or the assessment. In addition, this forum may provide a platform for the teacher to determine the learners' problems and concerns.

3.3 Technological

The technological component plays a vital role in ICT integrated learning environment. Availability and easy access of digital devices as well as internet are the pre-requisites for an effective technology oriented learning environment (Salmon, 2004). In addition, availability of technological reinforcements navigates sound design of pedagogy and social interaction (Mandell, Sorge, & Russell, 2002).

4. Methodology

For this research study, we have chosen 5 teachers from 5 different departments and 6 students from 4 different

departments of University of Dhaka. We have used convenience sampling to select the participants. All three research questions are of exploratory types. The central phenomenon of **R.Q. 1** is determining the effectiveness of current design of ICT integration. The central phenomena of **R.Q. 2** and **R.Q. 3** are obstacles that impede the ICT integration in teaching-learning and ways to overcome the obstacles.

First of all, interviews have been conducted with 5 teachers of 5 different departments including Physics, CSE, Finance, Biomedical Physics & Technology and IER of University of Dhaka to obtain answers for research question 1. Secondly, we observed 2 classes of each department to obtain answers to research questions 1 to 3. Thirdly, 6 students have participated in an FGD to provide information based on research question 1 to 3 as well.

Permission has been taken from each teacher and student before conducting interviews and focus group discussion. Total confidentiality and anonymity have been ensured in presenting data in data analysis section.

5. Result and Discussion

Information has been collected from teachers, students along with classroom observations to determine the presence of each component (pedagogy, social interaction and technology) in classroom situation and the integration of ICT in these components.

5.1 Pedagogical component

It has been found that the contemporary pedagogical paradigm (constructivist learning theory) is absent in the classroom. According to Kirschner *et al.*, the pedagogical design of a constructivist learning environment should have the capacity to support and fulfill various needs and learning intentions of the learner and have the flexibility with the learning content and objectives (Kirschner, Strijbos, Kreijns, & Beers, 2004). According to Teacher₁,

Teaching-learning approach has been changed by replacing blackboards with multimedia projector.

This study found that the integration of ICT in the pedagogy is limited only in presenting text-based content which is later on printed and given to students. This finding is similar to the finding of (Yildirim, 2007) where she found out that most of the teachers mostly use ICT tools to prepare course handouts. Similarly, a nationwide survey in the United States revealed that the teaching practices of the majority of teachers were not influenced by ICT integration (Becker, 2000). Moreover, it has been found that the current teaching-learning approach is traditional and Teachers use traditional lecture method in classroom. Stensaker *et al.* asserted in their study that higher education institutions are well known for their preference for traditional teaching-learning activities (Stensaker, Maassen, Borgan, Oftebro, & Karseth, 2007). It can, therefore, be said that all the characteristics of a sound pedagogical design (constructivist learning) are absent in our findings.

5.2 Social interaction component

It was observed in the study that students do not feel safe commenting on teacher's work or course material and the teacher gave the students no chance for asking questions in the classroom. In addition, there was no scope of group work in the class. Furthermore, there was no group sharing corner and friendly and interactive environment for learners to interact with each other. Moreover, instructor did not supervise a question/answer forum or successful online discussion to interact with students. According to Student₁,

Online discussion means Facebook group for sharing course contents by course teacher only.

Thus, there is no chance for students to interact themselves or with teacher in and outside classroom. According to Wang, the social design of the learning environment must focus on interaction between student to student and student to instructor (Wang, 2008). Thus, the classroom environment must include group work, group sharing space, online question and answer forum with instructor and asynchronous online discussions. Since, all the characteristics of a social interaction component and ICT integration to induce the social interaction are missing, it can, therefore, be said that the social interaction component of the generic model is absent in the classroom teaching-learning process.

5.3 Technological component

It is found from the responses of teachers that technological component is present in most of the classrooms. Teachers and students agreed that there is access to computers, fast internet service is available but there are no web blog. According to Student₂,

Wi-Fi connection is available for the students in our premises.

According to Salmon, availability of and easy access to computers and fast internet access is a prerequisite for technological design (Salmon, 2004). That means the educational institution has fulfilled the prerequisite for technological design to integrate ICT.

5.4 Obstacles to the integration of ICT

Participant students informed that due to the burden of too many classes in a day, teachers failed to prepare

materials for ICT classes. According to Student₁,

In many cases it appeared that teachers do not add related information in the slide because he/she was busy.

This is similar to the findings of Mndzebele where he found that for the teachers have a heavy load of classes; as such they do not have enough time to redesign teaching-learning components in accordance with technology (Mndzebele, 2013). Moreover, participant students also agreed in the FGD that the class time is too short for teachers to integrate ICT as they spent half of the class time preparing for the power-point presentations and cannot give students the opportunity to use computers in ICT oriented classes. This is similar to the findings of (Salehi & Salehi, 2012) and (du Plessis & Webb, 2012) where they mentioned that one of the major barriers of integrating ICT is the lack of classroom time for students to use computers. It is, therefore, clear that the current class time is not sufficient for effective integration of ICT.

Furthermore, participant students informed that most of the equipment and internet connections in classrooms for using ICT are either unavailable or broken. According to Student₂,

The Wi-Fi is accessible only for teachers; the sound system does not work.

This is similar to the findings of some researchers where they found that although contemporary technological resources are key features in the propagation of ICT integration, the educational institutions often lack adequate equipment and access to electricity (Mndzebele, 2013) (Yildirim, 2007). Moreover, scarcity of equipment and limited access to internet are one of the roadblocks in integrating ICT in classroom (Salehi & Salehi, 2012). It is, therefore, the lack of resources which prevented teachers to integrate ICT in the classrooms effectively.

In addition, participant students agreed that some of the teachers do not have necessary knowledge and skills necessary for an effective integration of ICT in classrooms. According to Student₃,

Teachers are not skilled enough. Many teachers cannot link up a video in power point slide. They need students' help.

Similar findings have been observed in Mamun and Tapan's study where they stated that teacher's lack of knowledge and skills regarding technology limit integration as well as utilization of ICT in teaching- learning activities (Mamun & Tapan, 2009).

On top of that it is observed that almost majority of teachers still find it is difficult to understand ICT's specific benefits or how it can be used to achieve maximum results. According to Student₄,

Aged teachers' belief system could be a reason they are not positive towards ICT integration.

Moreover, a small group of young teachers do not see any considerable benefit to learners while using ICT rather than as a burden. According to Student₅,

Younger teachers perceive the ICT integration as a burden.

This viewpoint is supported by some researchers who observed that despite many advantages of ICTs in teaching and learning, there is still contrasting perception among teachers regarding the benefit of using ICT (Balanskat, Blamire, & Kefala, 2006) (Korte & Hüsing, 2006).

6. Recommendations for ensuring ICT integration

We have received several suggestions to improve the scenario of ICT integration in teaching-learning process.

- Teacher training is one way to overcome the obstacles. According to Student₆,

I feel that teachers need training on ICT to conduct ICT based class.

This finding is similar to (Toprakci, 2006) where he mentioned that ICT training of teachers at university level would bear positive outcome on their teaching-learning practices. (Salehi & Salehi, 2012) voiced the same by asserting that teacher training institutions should provide appropriate and sufficient support to teachers.

- Participant students emphasized that collective planning to integrate ICT in classroom teaching learning is another way to improve the situation in ICT integration. According to Student₆,

Teachers and students need to share information with each other.

(Hinson, Laprairie, & Heroman, 2006) and (du Plessis & Webb, 2012) voiced the same where they stated that collective planning is essential for any implementation preparation and should include learners, staff members, parents, community etc.

- Teachers must possess positive attitude towards ICT integration. According to Teacher₂,

If the teachers are positive about ICT integration, then they can overcome lacking of technical skills.

According to studies by (Windschitl & Sahl, 2002) and (Zhao, Pugh, Sheldon, & Byers, 2002) teachers' beliefs about their own efficacy play a predominant role in how they conceptualize the integration of ICT in their teaching.

- Participants asserted that that in-service teacher training can be one of the ways to remove the obstacles. According to Teacher₃,

Situation might change if every one of the teachers is provided with ICT training when they join.

(Goktas, Yildirim, & Yildirim, 2009) stated in their study that teachers indicated that in-service training about ICT should be improved in quantity and quality.

7. Conclusion

Based on the findings above, we can conclude that among three of the essential components of learning, two of them, such as pedagogy and social interaction are absent. However, the technology component is present in the learning environment. Since, majority components for effective integration of ICT are missing, it can be inferred that ICT is not integrated effectively in the teaching-learning of higher education in Bangladesh in spite of the presence of technological component.

References

- Balanskat, A., Blamire, R., & Kefala, S. (2006). *The ICT impact report: a review of studies of ICT impact on schools in Europe*. Brussels: European Schoolnet.
- Becker, H. J. (2000). Pedagogical Motivations for Student Computer Use That Lead to Student Engagement. *Educational Technology*, 40(5), 5-17.
- Blurton, C. (1999). *New Directions of ICT use in Education*. UNESCO World Communication and Information Report.
- du Plessis, A., & Webb, P. (2012). Teachers' perceptions about their own and their schools' readiness for computer implementation: A South African case study. *Turkish Online Journal of Educational Technology*, 11(3).
- Goktas, Y., Yildirim, Z., & Yildirim, S. (2009). Investigation of K-12 Teachers' Competencies and the Contributing Factors in Acquiring These Competencies. *The New Educational Review*, 17(1), 276-94.
- Gunawardena, C., Lowe, C., & Anderson, T. (1997). Analysis of a global online debate and the development of an interaction analysis model for examining social construction of knowledge in computer conferencing. *Journal of Educational Computing Research*, 17(4), 397-431.
- Hinson, J., Laprairie, K., & Heroman, D. (2006). A failed effort to overcome tech barriers in a K-12 setting: What went wrong and why. *International Journal of Technology in Teaching and*, 2(2), 148-158.
- Kirschner, P., Strijbos, J. W., Kreijns, K., & Beers, P. J. (2004). Designing electronic collaborative learning environments. *Educational Technology: Research and Development*, 52(3), 47-66.
- Korte, W., & Hüsing, T. (2006). *Benchmarking Access and Use of ICT in European Schools 2006: Results from Head Teacher and A Classroom Teacher Surveys in 27 European Countries*. Empirica.
- Lloyd, M. (2005). Towards a definition of the integration of ICT in the classroom. *Proceedings AARE '05 Education Research - Creative Dissent: Constructive Solutions*. Parramatta, NSW.
- Mamun, M., & Tapan, S. (2009). Using ICT in Teaching-Learning at the Polytechnic Institutes of Bangladesh: Constraints and Limitations. *Teacher's World-Journal of Education and Research*, 33-34, 207-217.
- Mandell, S., Sorge, D., & Russell, J. (2002). Tips for technology integration. *TechTrends*, 46(5), 39-43.
- Mndzebele, N. (2013). Teachers Readiness in Using ICT in the Classroom: The Case of a Developing Country. *International Journal of Information and Education Technology*, 3(4), 409-412.
- Salehi, H., & Salehi, Z. (2012). Challenges for Using ICT in Education: Teachers' Insights. *International Journal of e-Education, e-Business, e-Management and e-Learning*, 2(1), 40-43.
- Salmon, G. (2004). *E-Moderating: The key to online teaching and learning* (2nd ed.). London: Taylor & Francis.
- Stensaker, B., Maassen, P., Borgman, M., Oftebro, M., & Karseth, B. (2007). Use, updating and integration of ICT in higher education: Linking purpose, people and pedagogy. *Higher Education*, 54, 417-433.
- Toprakci, E. (2006). Obstacles at integration of schools into information and communication technologies by taking into consideration the opinions of the teachers and principles of primary and secondary schools in Turkey. *Journal of Instructional Science and Technology (e-JIST)*, 9, 1-16.
- UNESCO. (2007). *The UNESCO ICT in Education Programme*. UNESCO Bangkok.
- Wang, Q. (2008). A generic model for guiding the integration of ICT into teaching and learning. *Innovations in Education and Teaching International*, 45(4), 411-419.
- Windschitl, M., & Sahl, K. (2002). Tracing Teachers' Use of Technology in a Laptop Computer School: The Interplay of Teacher Beliefs, Social Dynamics, and Institutional Culture. *American Educational Research Journal*, 39(1), 165-205.
- Yildirim, S. (2007). Current utilization of ICT in Turkish basic education schools: A review of teacher's ICT use and barriers to integration. *International journal of instructional media*, 34(2), 171-186.
- Zhao, Y., Pugh, K., Sheldon, S., & Byers, J. (2002). Conditions for classroom technology. *Teachers College Record*, 104(3), 482-515.