

Impact and Status of ICT Training for School Teacher

Background of the study

Education has always lived in tension between two functions: education as a matter of assuring continuity and as a matter of fostering change and creativity (Haddad & Draxler 2002). Within these developments, information and communications technology (ICT) brings a new set of challenges and pressures. Research on ICT in education reveals that although teachers are gradually starting to integrate ICT into their teaching strategies, significant differences are observed in the way ICT is integrated in the classroom (e.g. Tondeur et al. 2008b). Some teachers are intrinsically motivated to use ICT in educational practice, while others do not share this affinity. For this reason, many researchers have centered on critical teacher-related characteristics associated with educational ICT use such as their 'computer experience' (Bové et al. 2007), their 'innovativeness' (van Braak et al. 2004) and their personal 'beliefs about education' (Ertmer 2005). However, literature attests to the power ICT can have in teaching and learning processes (Fonkoua, 2006; Newhouse, 2002). It has been suggested that using technology well in classrooms can even prepare students to be more effective citizens (John & Sutherland, 2004) in increasingly open and democratic societies. Research in West and Central Africa shows that ICT for teaching and learning in school environments can contribute to develop a more child-centered approach to pedagogy (ROCARE, 2006). Teachers with pedagogical proficiency who are ready and willing to transmit knowledge and support students to construct knowledge will normally make a difference in any learning process. In this age of ICT and its integration in the educational system, the role of the teacher, just like in the traditional classroom environment, should not be overlooked or underestimated (Boakye and Banini, 2008). Thus, there is a global trend in both educational policy and research to recognize the need to reform education from traditional paradigms of teaching and learning into more innovative forms of pedagogical practice. These areas of practice and change are often described with concepts such as information or knowledge society, emerging pedagogy and 21st century skills (Ottestad, 2010).

The use of Information and Communications Technologies (ICT) in schools is taken very seriously by governments and education systems around the world. Bangladesh, like many other countries, is investing heavily (estimated BDT 17,959 crore annually) in the education system

considering as one of the core strategies to alleviate poverty and facilitate development including to raise the ICT skills of Bangladeshis and move towards the information society (Rahman, 2010). This is testament to the importance being placed on education and training in the use of ICTs and the setting of high priorities to improve learning outcomes to prepare young people for the contemporary information economy. Moreover, Bangladesh has an Information and Communication Technology (ICT) policy formulated for human resource development that states that the country must prepare itself to compete effectively in the global ICT wave. With the development of ICT and its use in education the developed countries of the world change its teaching learning to make it more effective. To compete with this new situation we must introduce and properly use ICT in the existing teaching learning process especially in the field of secondary education in Bangladesh. No doubt, in recent years ICT application appears in pedagogy with such an influential means that can progress the quality of secondary education in Bangladesh.

In Bangladesh, computer science was introduced as an optional subject for secondary level students from the beginning of 1994, and about 150 schools were permitted to start up the subject (Ali, 2003). Many more schools have shown interest, and the quantitative expansion of ICT education at the secondary level is phenomenal. The National Education Policy has recommended compulsory computer courses from the secondary level of education. The Board of Intermediate and Secondary Education, Dhaka introduced computer science as an optional subject in 1991. Already, more than 200 colleges have introduced computer science as an optional subject for science stream students (Ali, 2003).

The distinction between ‘computers as a subject’ and ‘computers as an educational tool’ is the focus in a series of recent studies that aim at obtaining a more in-depth understanding of classroom use of computers. In the study of Baylor and Ritchie (2002), computer use was delineated according to nine subcomponents, including ‘subject-matter content’. Other subcomponents refer to the use of computers as an educational tool, such as ‘the use of computers for collaboration’ and ‘the use of computers for higher order skills’. Computers as an educational tool may fit into a spectrum of instructional approaches, varying from traditional to innovative. Niederhauser and Stoddart (2001) differentiate between two main types of educational computer use: ‘skill based transmission use’ and ‘open-ended constructivist use’.

‘Skill-based computer use’ aims at enhancing pupils’ basic knowledge and skills by supporting drill and practice exercises and embraces two subtypes of traditional software: ‘drill and practice’ and ‘keyboarding’. ‘Open-ended computer use’ presents computers as a tool for helping learners to construct their own knowledge.

Three subtypes of open-ended constructivist software are identified: ‘educational games’, ‘exploratory programs’ (e.g. LOGO), and ‘tool programs’ (e.g. Word). The results of Niederhauser and Stoddart’s (2001) evaluation study indicate that the majority of teachers centre on skill-based educational computer use. Typologies of computer use are required to construct research instruments in view of empirical studies. Few studies published in the literature report in an explicit way how the research instruments have been designed.

The second information technology in education study (SITES) Module 2 (Kozma, 2003) study is an exception because its research methodology is clearly described. Based on 174 case studies from across 28 countries, both qualitative and quantitative methods were used to identify seven clusters of innovative pedagogical practices building on computers use. Also, in the study of Hogarty et al. (2003), the development and validation of the instrument is transparent. Factor analytic and correlation methods were used to identify two factors delineating types of software use by teachers. The first factor represents the use of ‘instructional software’, including the use of educational software, drill and practice, and educational games. The second factor encompasses ‘application software use’. Typical examples of the latter are the use of word processors, web browsers, and presentation programs. Similarly, two factors were identified regarding student use of software.

‘Application’ of software is explored in many studies, but these studies hardly help to clarify the educational use of the software. The questionnaire designed by Kent and Facer (2004) reflects a range of computer activities (e.g. e-mailing, gaming, writing, and drawing) in order to compare pupils’ home and school use of computers. In Pelgrum (2001), a list of seven items of computer use is presented in order to identify the main obstacles regarding computer integration in education: operating a computer, writing documents, making illustrations, calculating, etc. In only a few studies, the focus is on the instructional objectives that are pursued by adopting types of computer use. For example, Ainley et al. (2002) identified four broad categories, based on a proposal by Rubin (1996): ‘computers as information resource tools’ (to provide access to an

information base), ‘computers as authoring tools’ (to work with and present information), ‘computers as knowledge construction tools’ (to explore knowledge), and ‘computers as knowledge reinforcement tools’ (to engage in drill and practice activities). In Becker (2000), both an instructional and a software application approach can be found when he studied the relationship between types of computer use and teachers’ educational beliefs. The survey asked teachers to select three instructional objectives out of a list of 10, such as ‘communicate electronically’, ‘improve computer skills’, and ‘learn to collaborate’. The survey also asked teachers to name the software that is considered most valuable in their teaching. The data suggest that teachers with a strong constructivist orientation are eager to adopt types of computer use that foster constructivist learning approaches, e.g. Internet browsers.

- ***ICT in Education***

The government has taken some initiatives to use ICT in Education. For example, the government published 61 million results of public exams over internet, 37.4 million over SMS in 2012 and 63 million results of public exams over internet, 38 million over SMS in 2013. Moreover, in last year 2.7 million admission applications received through SMS. On the other hand, government introduced Multimedia Classroom at 503 secondary schools in 2012 and 20500 secondary schools in 2013 to ensure ICT in classrooms. Furthermore, the government arranged ICT training for secondary school teachers through A2I project, TQI project and other projects.

- ***Access to Information (A2I) Project:***

This project is organizing ICT training programme for secondary school teachers. This training programme will try to develop the ICT teaching learning process at classroom, to increase the ICT usability of secondary teachers and develop the teachers’ ICT skills also. It is 12 days training programme. The training will be conducted following participatory method. The main objective of this programme is “How to develop digital content and how it will be applied at secondary classroom.” The major area of contents are use of MS work, use of MS power point, Internet browsing, Picture download & use in power point, Video cutting, clipping, Joining & convert, use of multimedia projector, use of *Shikkok Batayon*, necessary software downloading and installing etc.

- ***TQI-SEP Project:***

The Teaching Quality Improvement II in Secondary Education Project provides mainly subject-based and CPD training for the secondary teachers. Furthermore, in 2014, this project introduces the similar training programmes of A2I with its regular training. The ICT capacity of teachers and their ability to prepare digital contents for improving teaching quality are emphasized along with other aspects in the training programmes. A series of training programmes have been arranged already and also going on across the country through the Teachers' Training Colleges.

Rationale of the study

Moreover, recent research (e.g. Waite 2004) indicates that although teachers in schools show great interest and motivation to learn about the potential of ICT, in practice, use of ICT is relatively low and it is focused on a narrow range of applications, with word processing being the predominant use, and video/network conferencing, emailing and the Internet being rarely used. International research suggests that ICT as a tool to promote learning is not generally well embedded in teachers' practice (Cox et al. 1999; Pedretti et al. 1999; Zhao & Cziko 2001) and that 'information technology in the classroom is used in an ineffective way and it has proven difficult to integrate within traditional curriculum settings' (Jules Van Belle & Soetaert 2001, p. 38) In the Scottish context, the evidence suggests a similar picture (Williams et al. 1998). Many teachers recognize a range of benefits for pupils and themselves in using ICT, but more often than not fail to integrate it in their teaching, continuing to 'teach ICT rather than teach with ICT'. In primary schools, teachers tend to use ICT to support classroom practice, while secondary school teachers use it more for professional development and personal use rather than for teaching. The same study showed that teachers who use a computer at home tend to use it more in classrooms and that differences exist between subject areas in the practice and attitudes towards ICT, with teachers of business management using it more and Mathematics and science teachers using it the least.

Many reasons have been suggested for the failure of ICT to embed more completely in schools. Pelgrum (2001) reports on an international survey of teachers' perceived obstacles to using ICT and identifies three major factors: lack of resources, lack of knowledge and skills and pedagogical difficulties to integrate technology in instruction. The competence factor and teachers' confidence in their skills as a major factor that conditions teachers' willingness to integrate technology in their teaching is cited by other research (Williams et al. 1998; Mooij &

Smeets 2001). Dawes (2001) identifies the critical importance of the following factors as perceived barriers in teachers' use of ICT: ownership of up-to-date technology; a sense of purpose for ICT use; adequate training; realistic time management; and inclusion in supportive communities of practice. Zhao and Cziko (2001, p. 27) identify three conditions that must be fulfilled for teachers to be motivated and use ICT in their practice:

1. Teachers must believe that by using technology they are more likely to achieve a higher-level goal than through other means used ('effectiveness').
2. They must believe that if used, technology will not disturb the other high-level goals that they want to achieve ('disturbances').
3. Finally, teacher must believe that they are in control, having the ability and resources to use ICT effectively ('control').

These authors suggest that once these conditions achieved, teachers will introduce ICT in their lessons. Cox et al. (1999) talk about a 'technology acceptance model', explaining the interplay between external factors and perceived usefulness and ease of use as conditioning the use of ICT. Teachers were reported to include mainly external factors (training, time to explore software, new computers, appropriate software) when discussing their progress with using ICT for literacy activities (Waite 2004). In the same study, almost 75% of the teachers considered that when using computers and the Internet, they had to change the ways in which they planned their teaching. This may suggest another factor that may act as a barrier in using ICT in classrooms, as teachers may require extra time to prepare a class. A teacher may have to book the computer suite or a laptop, decide activities suitable for computer use, check software in advance and have a contingency plan etc. Many of these issues can be neatly encapsulated by the practicality ethic articulated by Doyle and Ponder (1977). This suggests that teachers may oppose or fail to enact change even where it is congruent with their core values, should such change lack instrumentality (i.e. be difficult to enact) and if there are potentially significant costs (for example professional risks). The practicality ethic may be strengthened, and teachers thus motivated to use ICT, when there exists a supportive community of users among practitioners who can learn collaboratively by exchanging ideas either in face-to-face discussions or in online communities, through emails, discussions, and online staff boards, etc. (Preston 1999; Leask & Younie 2001).

As a result, Information and Communication Technology (ICT) in teaching and learning is high on the educational reform agenda. Often ICT is seen as an indispensable tool to fully participate in the knowledge society. ICTs need to be seen as “an essential aspect of teaching’s cultural toolkit in the twenty-first century, affording new and transformative models of development” (Leach, 2005). Also developing countries are investing in ICT. Especially also Asian governments recognize that this can be the way to enable pupils to connect to knowledge available in the wider world and become active processors rather than passive recipients of this knowledge (Latchem & Jung, 2010). There is a large body of research on factors determining the integration of ICT in education, mainly emerging from research in developed countries. Emerging developing countries can draw on this research. Hawkrige (1990) already advised that nations need to pause for reflection and that policies on integration of ICT in education need to be tested.

In addition, the results of some studies reveal that unavailability of modern ICT tools, lack of motivation and training, job satisfaction and attitude towards the use of ICT tools in teaching learning activities (pedagogy) are the main constraints in secondary education level. So, this project will attempt to motivate the teachers to use ICT in their daily teaching in classroom with train up on some skills on using ICT in pedagogy. This proposed research project will also endeavor to the present status of ICT training and its’ impact on school teachers for improving the ICT teaching learning in secondary schools.

Purpose of the Study : This study aims to explore the present status of ICT training and its’ impact on secondary school teachers. More specifically, this study tries to identify the status of ICT training, opportunity to use ICT at secondary classrooms and the reflection of ICT training on secondary school practices. Finally, this study tries to discover the challenges faced by the secondary teacher to use ICT in classroom.

Research Questions

The main objective of this study is to discover the present status of ICT training and its’ impact on school teachers. The specific objectives of this study are:

1. What is the status of ICT training for secondary school teachers?
2. To what extent the teachers have opportunity to use ICT at schools?
3. To what extent the outcomes of ICT training reflected at schools?
4. What are the challenges faced by the secondary teacher to use ICT in classroom?

Methodology

Nature of the Study

A mixed method approach (Both quantitative and qualitative data analysis) was used to conduct this study. This study has been conducted following mixed method research approach. Multiple instrumental approaches have been applied for collecting data. The primary data has been collected using checklist, questionnaire, classroom observation, semi-structured interview and FGD guidelines. The study methodology is consisted of the following activities:

In order to ensure the effectiveness and feasibility of the study, the data have been collected from 100 secondary schools in Bangladesh. The secondary school head teachers, assistant teachers, ICT trainers and students have been engaged with the study to collect qualitative and quantitative data. The data has been analyzed in mixed method approaches.

Population of the study

The following are the populations of this study are:

- All the secondary schools of Bangladesh
- All Head teacher of secondary schools
- All the assistant teacher of secondary school
- All the students of secondary schools
- All classroom of secondary schools
- All ICT trainers of secondary schools

Sample & Sampling Procedure

The study has been covered all the administrative divisions considering the geographical locations in Bangladesh. Thus, the sample categories are:

- A total of 02 metropolitan cities and 07 districts have been selected randomly from different geographical locations in Bangladesh. Among the districts, 01 district has been selected randomly from each of the administrative divisions.
- A total of 14 Upazilas have been selected from the selected districts i.e., 2 upazilas from each district. In selecting the upzilas within the selected districts the sadar upzila has been selected purposively while the other upazila within the district has been selected randomly.
- A total of 100 secondary schools have been selected randomly from the selected metropolitan cities and upazilas. Among the schools, 30 secondary schools have been selected from the metropolitan cities i.e., 15 schools from each city and 70 secondary schools have been selected from the upazilas i.e., 5 from each upazila.
- A total of 100 Head Teachers have been selected purposively to collect their opinion in this regard.
- A total of 100 teachers have training on ICT have been selected purposively to collect their opinion on ICT and its use in secondary schools classroom.
- A total of 100 classrooms of secondary school have been selected randomly to observe the situation of ICT and feasibility in the classrooms.
- A total of 10 groups of students (each group will consist 6-8 students) have been selected randomly to search their opinion on impact and status of ICT training of secondary teaches.
- A total of 05 ICT training providers have been selected purposively to search their opinion regarding Teacher Training on ICT and its impact at school level.

The Table 1 showed the overall picture of sample and sampling techniques of this study.

Table 1: Sample and sampling techniques

Respondent type	Sample size	Specification of sample size	Sampling techniques
Division	7	All administrative division	Randomly
Metropolitan	2	Among the metropolitan cities	Randomly
Districts	7	1 from each division	Randomly
Upazial	14	2 from each district	Randomly

Schools	100	10 from each metropolitan and 5 from each upazila	Randomly
Head Teachers	100	1 from each school	Purposively
ICT trained Teachers	100	1 from each school	Purposively
Students	10 group	1 from each school	Randomly
Classroom observation	100	10 from each metropolitan and 5 from each upazila	Randomly
ICT Trainers	05	From the TTCs	Purposively

Results

The major results of the study are:

- A total of 546 Teachers and office staff received ICT training from different organizations. The Ministry of Education is the main provider of ICT training along with the Ministry of ICT.
- All ICT teachers of secondary schools have basic ICT training, training related to the use of ICT in classroom and how to prepare power point. Majority of the training programmes focus on internet browsing and using e-mail.
- All the secondary schools located in the metropolitan areas have computer and laptop to use. Majority urban secondary schools and only less than half rural secondary schools have computer. 16.7% schools have less than 5 computers in the metropolitan areas while 5.7% in urban schools and 11.4% in rural secondary schools. A total of 5-10 computers are available in 20% schools located in metropolitan areas while same number of computers is available in 34.3% urban and in 25.7% rural schools.
- The laptop is found lower in terms its number considering all areas. One-third of the rural secondary schools have only 1 laptop while nearly half (42.9%) of the urban secondary schools have 2 laptops and most of the secondary schools located in the metropolitan areas have 3 laptops.
- All the secondary schools located in the metropolitan areas and urban areas have computer at Head Teacher's room while 42.9% rural secondary schools have computer at Head Teacher's room.

- All secondary classrooms of metropolitan have electric connection, computer, laptop, internet line, overhead projector and multimedia projector. Most of the rural and urban secondary classrooms have electric line. Majority (76.7%) metropolitan secondary classrooms have white board and 62.8% have electric board in classroom.
- The Head Teachers use computer mainly for official purposes while use in classroom teaching learning is rarely found. A good number of computer teachers and general assistant teachers are also use computers for official purposes while the Science and Mathematics teachers use it in lower proportion.
- All teachers of metropolitan, most of the teachers of urban and rural secondary teachers' have enough ability to use computer. ICT training helps the secondary teachers to develop their skills as well as their teaching quality for effective teaching-learning in classrooms.
- Most of the training programmes provide to develop ICT materials and Video materials in secondary school. Most of the trainer mentioned that ICT training helps to develop teachers' skills.
- Almost all the ICT teachers are using ICT while taking their classes in the secondary schools irrespective of locations.
- Most of schools of all areas are facing three major problems like lack of ICT teacher training, lack of skilled teachers and lack of students' opportunity to use ICT in classroom.
- ICT trainers identify the scarcity of training, skilled teachers, inadequate ICT materials and infrastructural facilities as the major challenges of using ICT at secondary schools.

Recommendation

The following recommendations have been identified based on the findings of this study:

- All the teachers of the secondary schools should have ICT training. The Ministry of Education might take initiatives to arrange training programmes for all secondary school teachers through its existing projects like TQI-SEP II.

- The focuses of ICT training might be given to teacher's basic ICT skills and its application in classrooms irrespective of subjects. The most relevant and necessary aspects should be come first and then the supplementary components would come. Teacher's motivational development would also be considered while designing the training programmes.
- Have to provide sufficient computer for every school so that every classroom have at least one computer. In this regard Govt. might take necessary initiatives through its different projects for improving secondary education quality.
- Should increase awareness of the authority about using of ICT in classroom for ensuring quality education.
- To create interactive classroom environment ICT facilities such as projector, multimedia, electric white board and smart board should be ensured. Each classroom should have power supply and alternative power supply facilities to smoothly use ICT in classrooms. Internet facilities could be ensured in every classroom so that teachers can easily download and use necessary materials available.
- The computers should be used for classroom teaching-learning not for official purposes only. It should be ensured by the school authority as well as higher authority.
- There should be an opportunity for the children to use computers so that they can use the ICT materials for their learning. Specific time schedule might be designed for these purposes considering the schools schedule.
- Government can supply computer in reasonable price for the schools and also for teachers and students. It would be feasible to supply necessary computers through the A2I project to each and every school.