Study on Prospects and Challenges of Using ICT in Madrasha Education at Dhakil Level

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' (Bovée 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 in more child-centered approach than 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 formal education 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). After that it was included at madrasha education as a part of government initiatives. Moreover, the national education policy 2010 also emphasize ICT at madrasha education for creating human capital of our next generation and developing skilled man power for international market.

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), and '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.

Rational 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 educational institutions. 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:

- Teachers must believe that by using technology they are more likely to achieve a higher-level goal than through other means used ('effectiveness').
- They must believe that if used, technology will not disturb the other high-level goals that they want to achieve ('disturbances').
- 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,

5

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. Hawkridge (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 Dakhil level. So, this study attempted 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 study was also endeavored to the present status of ICT training and its' impact on madrasa teachers for improving the ICT teaching learning in secondary schools.

Research objective

The main objective of this study is to explore the prospects and challenges of using ICT in madrasha education at Dhakil Level in Bangladesh. The specific objectives of this study are:

a) to explore the infrastructural capacity of the madrashas having Dakhil level for using ICT at classroom.

b) to find out the manpower capacity in madrasha education at Dhakil level in Bangladesh for using ICT.

c) to identify the challenges for using ICT at Dhakil level classroom in Bangladesh.

Nature of the Study

This study was conducted following mixed method research approach. Multiple instrumental approaches were applied for collecting data. The primary data was collected through checklist, questionnaire, classroom observation and FGD guidelines. The study methodology was consisted of the following activities:

In order to ensure the effectiveness and feasibility of the study, the data was collected from 112 madrashas having Dhakil level in Bangladesh. The madrasha superintendent/principal, assistant teachers who are assigned as ICT teacher and students of Dhakil level were engaged with the study to collect qualitative and quantitative data. The data was analyzed in mixed method approaches.

Population & Sampling of the study

The populations of this study were:

- All the madrashas which have Dhakil level
- All superintendent/principal of the madrashas having Dakhil level

- All the assistant teacher who use ICT
- All the students of dhakil level
- All classroom of dhakil level

The study was covered all the administrative divisions considering the geographical locations in Bangladesh. Thus, the sample categories were:

- A total of 14 districts were selected randomly from different geographical locations in Bangladesh. Among the 14 districts, 2 districts were selected randomly from each administrative division.
- A total of 28 Upazilas were selected randomly. Among those upazilas, 2 upazilas were selected from each district.
- A total of 112 madrashas having Dhakil level were selected randomly where 4 madrashas (available) select from each upazila. In selecting the madrashas, location of the madrashas namely urban and rural were considered to maintain.
- A total of 112 superintendents/principals of madrashas were selected purposively to collect their opinion in this regard.
- A total of 112 teachers use ICT were selected purposively to collect their opinion on ICT and its use in Dhakil level classroom.
- A total of 84 classrooms of Dhakil level were selected randomly to observe the situation of ICT is used or not in that classroom. Moreover, 2 madrashas were selected from each district regarding 1 from urban and another 1 from rural areas.
- A total of 14 groups of Dhakil level students (each group was consisted 6-8 students) were selected randomly to search their opinion on impact and status of ICT training of madrasha teaches.

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
Districts	14	2 from each division	Randomly
Upazial	28	2 from each district	Randomly

Madrashas have Dhakil level	112	4 from each upazila (if available)	Randomly
Superintendents/ Principals	112	1 from each madrasha	Purposively
Teachers use ICT	112	1 from each madrasha (if available)	Purposively
Students of Dakhil level	14 group	1 from each madrasha	Randomly
Classroom observation	56	2 from each upazila	Randomly

Major findings of the study:

- Maximum teachers of Dakhil Madrashas have more than 5 years experience on teaching both at Urban and Rural area. Maximum teachers both of rural and urban areas have graduation and minimum numbers of teachers have post-graduation.

- Most of the Assistant teachers use ICT of both urban and rural area have ICT related training on Basic ICT training, Digital contents and computer operating system. On the other hand, the urban area teachers have more training on digital contents than rural area's teachers.

- For ICT training, the teaching learning process became real, joyful for the students, support to developing the students creativity, developing computer skills and life skills, support to use multimedia in classroom and help to use internet.

- ICT training is improving teacher's personal and professional skills and confidence. The training helps to use modern technology for sustainable learning and enjoy-full classroom activities.

- Most of the madrasha at urban level have laptop (80.9%) and more than 50% have desktop on average 1-5 number. In rural level, maximum madrasha have on an average 1-5 numbers of laptop (72.4%) and desktop (75.3%).

- Most of the madrashas (93.6%) located in urban areas have on an average 1-5 numbers of computers and 55% at rural areas have on an average 1-5 numbers of computers at the office room.

- Maximum computer teacher and office assistant use the computer at madrasha. At urban area nears, about 50% of the superintendent/principal use computer whereas it only 37.7% in rural areas. On the other hand, very few number of other teachers were using computer at madrasha.

- The computers were using for computer teachers' work, superintendents' work and teachers' personal work both rural and urban area.

- There were black board, white board, electricity (urban-96.8% & rural-78.3%), multimedia projector(urban-645% & rural-62.3%), internet facilities (urban-45.2% & rural-50.7%), computer (urban-48.4% & rural-59.4%) facilities for ICT based teaching learning process.

- Most of the teachers were using computer for MS Word, maximum teachers were using computer for MS Excel, MS Power Point and Internet browsing. Near about or more than 50% teachers both in urban and rural area were using computer for you tube, facebook, Shikhak Batayon and web browsing.

- ICT has made teaching and official work easy, ensuring quality education, developing professional skills and experiences; computer has made the learning sustainable, joyful, easy and interesting for the students.

- After training it had developed teaching methods, subject based skills and confidence, done more work in short time, ensuring effective teaching learning activities, improving personal and professional skills. It had easy to proper utilization of time, easier to assess the students' performance, teaching became students' centered; students became more satisfaction than before using of multimedia and internet.

- Urban (87.1%) teachers used more ICT in class room than rural (73.9%) teachers. Almost all the teachers at urban area and most of the teachers at rural area (94.2%) agreed that using ICT in teaching learning activities at class room was effective.

- ICT based teaching learning activities had increased students participation in group study, easily teaching the students, exchange the information in short time, students became attentive, attractive for audio, video and picture based joyful and effective learning, students' creativity and practical knowledge became increased.

- The teachers also claimed that ICT had made easy to solve any problem, provided real life examples through audio and visual materials and exchange of information in short time.

- There were available of information, audio, video and real materials in internet had made the teaching learning activities easily applicable. Besides laptop, projector, visual text materials and contents had made teaching effective and taking short time to have preparation for effective teaching.

- Most of the urban teachers (90.3%) and 82.6% of rural teachers mentioned that there were lacks of sufficient training on ICT for the teachers and lack of in-fractural ICT facilities.

- After ICT training, teachers are now improving their lecture, taking participatory methods for joyful teaching, motivate the students learning and official work became easier. On the other hand, the superintendents also explained that there was no change after the training. The teachers were going to class as usual; they did not apply their knowledge at class room.

Recommendation

Based on the emerged findings of this study the following recommendations regarding the direction for further research have been made:

✓ Most of the teachers who use ICT have training on ICT and its uses. However, it is necessary to ensure ICT training for all teachers so that they can use this technology in the daily classroom teaching-learning. In this regard the authority could take initiatives to train up the teachers and the trained teachers could assist others for developing their capacity in using ICT in classroom.

✓ Adequate computer or laptop is necessary developing capacity and its utilization for classroom purposes. The teachers should have available computer/laptop at the classrooms so that they can use ICT in the everyday teaching at Dakhil level.

✓ Supervision and monitoring as well as mentoring are needed to be emphasized for ensuring use of ICT at classroom level. Mentoring would also help teachers for effective uses of ICT which would foster teachers' capacity as well.

✓ The necessary facilities are the pre-requisites of ICT based teaching-learning activities as institution level. Therefore, infrastructural facilities especially computer/ICT lab, electricity and alternative power supply are required in every madrashas. Moreover, Computer/Laptop, internet, white board, multimedia and projector for every classroom are needed to be supplied for ensuring interactive classroom.

✓ Knowledge is always dynamic and changes as required. The trained teachers would need further training for acquiring new knowledge and skills about modern ICT devices and their using modality for effecting interaction in classrooms. Therefore, refreshers' training is needed to be planned for the training teachers to transmit the updated information and skills of using ICT for effective teaching learning.