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Exploring Access Level and Factors of Hindrances of Using ICTs by Teacher Educators of Bangladesh

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Abstract: *ICT is a tool for effective teaching-learning process. It enhances education in various ways. Technology changes teaching and learning models in teacher education. This study aims to present the status of access level with attention to find out the factors of hindrances of using ICT by teacher educators. These issues were investigated using online survey methodology with a sample of teacher educators (n=88) from six teachers' training colleges of six divisions. Data were analyzed using descriptive statistics. Results show that teacher educators have average accessibility facility to ICT but moderate user of e-mail and internet. It identifies that lack of expertise in ICT and insufficient knowledge of appropriate softwares that causes from lack of appropriate ICT knowledge are major factors of hindering use of ICT that needs continuing professional development supports.*

Key Words: *access level, factors of hindrances, teacher educators, Information and Communications Technologies (ICT), digital divide.*

Introduction:

Literacy spread over in very different spheres and concepts of literacy have extended uttering that clusters of skills need for both students and the teachers in the form of digital literacy or e-literacy (Anderson, 2010). Technology changes teaching and learning models (Becta, 2009). ICT can be an effective tool in supporting teaching and learning along with pedagogical and technical expertise of the teacher (Hennessy, Harrison, & Wamakote, 2010).

Traditional teacher training as well in-service continuing training institutes are experiencing a rapid change in the structure and content of the training, and delivery methods due to speedy development in ICT (Jung, 2005). Correspondingly, it has an evident that teachers receive advantage from computers and the Internet which enabled them greatly to improve their knowledge of subject matter (Hawkins, 2002). ICT can be

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used as a core or a complementary means to the teacher training process (Collis & Jung, 2003). Presently, ICT is using in a broad spectrum. The UNESCO formulated a policy framework of ICT competency standards for teachers in which it is strongly anticipated that ICT will leap forth, both teachers and learners (UNESCO, 2008). The Becta survey reported that ICT helps teachers to personalize learners' learning (Rudd et al., 2009). However, it is surprisingly true that most teachers still unfamiliar with the social softwares. So, harnessing technology is still limited worldwide.

Teacher educators prepare the classroom teachers. So, it is extremely important to be familiarized, make well accessible to ICT by the teacher educators in their work places. Technology literacy is important for both teachers and teacher educators which involves the appropriate level of ease of access. Some hindrances may limit the opportunity of accessibility. This study reveals the level of accessibility and the factors of hindrances of access to ICT by the teacher educators in Bangladesh.

Research Questions:

This research attempts to investigate several questions focus on the teacher educators' access level and factors of hindrances of ICT in teachers training colleges. More specifically:

RQ 1: Which ICT do teacher educators' have access to in their colleges and what is the frequency of their access per week?

RQ 2: What is the adequacy and availability level of ICT in teachers training colleges?

RQ 3: What are the factors hindering teacher educators' readiness in using ICT?

Theoretical Framework:

In the following review, we provide a brief overview of generic term ICT, teacher educators' access level to ICT with adequacy and availability for integration in teaching-learning process, and factors of the hindrances of using it. The review will be followed by the articulation of the set of research questions.

Information and Communication Technologies (ICT):

The generic term ICT stands for Information and Communications Technologies. Various definitions of ICT have been emerged in different literatures. According to Wang & Woo (2007), ICT is basically a tool that

can be hardware such as computers, digital cameras, and software such as Excel, discussion forums, or both. ICT also refers to the technologies which are being used for collecting, storing, editing and passing on information in various forms (Sumalatha & Ramakrishnaiah, 2007). Some studies, like the study of Foley, Alfonso, & Ghani (2002), includes ICT as PCs, mobile telephones, interactive digital TV, PDAs and games machines. The definition of ICT employed in this study is based on the definition pronounced by the UNESCO in 1999. It states that "the Information and Communications Technologies (ICTs) are a diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information (Blurton, 1999, p. 1)". These technologies include computers, the Internet, broadcasting technologies, and telephony. Later, it restated in ICT transforming education: A regional guide published by UNESCO, Bangkok which summarizes ICT as many technologies for capturing, interpreting, storing and transmitting information (Anderson, 2010). Author added that the term ICT is plural, referring to many technologies. But for the convenience use, the study uses it as ICT only. The main three uses of computers are e-mail, Internet access, and work and people usually connect with internet via PCs, WAP phones, digital TV/set top boxes, and games consoles (Russell & Stafford, 2002).

Adequacy and availability level of ICT:

The B Ed curriculum has a compulsory course on ICT titled "Basic Computer Skills" carrying 50 marks; half of it evaluated in college level as internal assessment (B Ed Curriculum Report 2006). Likewise, every teachers' training college is equipped with some level of essential hardwares and softwares as TQI-SEP, a project functioning for improving teaching quality in secondary level initiated by Ministry of Education, Bangladesh provided Computer Lab with brand PCs and essential accessories.

Use of ICT in education has a long history. ICT has played an educational role in formal and non-formal settings. Teachers and students use ICT, such as computers, personal digital assistants, cell phones, interactive white boards, digital and document cameras, digital video equipment, digital audio recorders and players, and digital projectors to communicate, create, disseminate, store and manage information (Hutchison, 2009). In a study conducted in The Robert Gordon University Aberdeen (2004) in Scotland on teachers' ICT skills and knowledge need reported that the use of ICT is relatively low and is focused on a fairly

narrow range. Surprisingly, it is observed that although the availability of computer facilities was reportedly quite high, actual level of use was quite low and relative to other subject teachers, science teachers came out positively with regard to confidence and using ICT (Gray and Souter, 2004). Another study of Gillwald, Milek, & Stork (2010) builds evident that developing countries have not equitable access facility of using ICTs due to some constraints like high cost of services or equipment.

The study of Russell & Stafford (2002) confirms that usage of ICT has increased along with internet use among all age groups and growth has been largest among 35 to 44 year which is align with the report of OECD (2001) uttering that it is similar across the countries. The study also shows that most of the users work on computer daily and the heaviest users are the age group of 25-34, but less variation in the use of the internet which counts 7.0 hours to 7.9 hours in a week. However, males spend more time on the Internet than females (Russell & Stafford, (2002); Foley, Alfonso, & Ghani, 2002).

'Digital divide' is a new phenomenon emerged in the field of ICT refers to the disparity between those who have use of and access to ICT and those who do not (Foley, Alfonso, & Ghani, 2002; Anderson, 2010). The study reports that recently it has added an extra dimension to this definition by asserting that it should focus on the effective use of ICT for social and economic development and not simply 'access' and 'use'. Moreover, a digital divide exists between high, medium, low and non-users. Furthermore, lack of physical access has been regarded as the key barrier to ICT adoption and use stating that widening access to ICT will help to bridge the digital divide rather providing simple technocratic solution (ibid.).

Factors hindering use of ICT:

Personal ICT skills are prerequisite for using technology in the classroom (Becta, 2009). In a study done by Gillwald, Milek, & Stork (2010) indicates that women generally have less access and use ICT though men and women share similar backgrounds which also supports by OECD (2001) though it has a considerable variation across the countries. In addition, lack of computer skills is one of the main factors hindering men and women from using the Internet while confidence partly responsible for detaining. Authors also argued that formal education should introduce the ICT literacy as an integral part of curriculum, and at the same time on the job training should be provided with incentives. Another study shows that interest and attitude create digital divide, and orderly people

generally do not use computers and are not interested in using ICT (Russell & Stafford, 2002; OECD, 2001). The study also reveals that some interested non-users of computers expect free or cheap lessons as incentives along with cheap or free equipment or software. Hawkins (2002) reports that World Links program bridges the "digital divide". Through this program students and teachers get prepared in necessary technologies, skills, and educational resources to prepare. In a survey report of World Links the teachers reported that the lack of adequate hardware and software as well as unreliable Internet access hinders teachers using computers in instruction along with necessary support services (Hawkins 2002). Concurrently, author urges avidly for professional development of teachers' technology and education program. Rudd et al., (2009) study urges to foster confidence and efficacy in ICT to continue the improvement of teachers with support and additionally at least a little more continuing professional development scheme. Along with others education can be a concern of accessing to ICT (OECD, 2001; Foley, Alfonso, & Ghani, 2002). In the report, Science, technology and industry outlook 2001: Drivers of growth, published by OECD in 2001 elucidated that educational attainment helps to explain the differences in access to ICT. It clarifies that person having tertiary level education has more access to PC and internet than the lower educational attainment.

Methodology:

This study employs non-experimental and quantitative research in order to uncover some possible understandings of the research questions that previously outlined.

Research Design:

The study employs descriptive survey method, as Bethlehem (2009) describes the survey as a powerful instrument to collect new statistical information about a population using a questionnaire to the representatives of the elements in the population. This study uses the Bethlehem (2009) survey process ignoring the 'nonresponse correction' step. In addition, it embraces email survey as Simsek, F. Veiga, & H. Lubatkin (2005) justifies internet survey technique as a process of faster data gathering, error-free data entry, and lowering costs as well having respondents freedom to answer from anywhere, at their own pace and time.

Sampling:

The population of the study is 447 teacher educators of 14 government teachers' training colleges in Bangladesh. Among them, all teacher educators of six teachers' training colleges, one each from six divisions, were selected for sample as the colleges spread over the country.

Instrument:

This study involved in collection of quantitative data. In this instance, a structured questionnaire was adopted from the study of Tella et al. (2007) to gather data with necessary modification. The instrument consists of two sections: one for demographic information and the second section contains some items of inquiry align with research questions. The questionnaire has been piloted before administering among respondents.

Data Collection:

Data was collected from early June to 3rd week in 2010. Among 120 teacher educators 27 sent questionnaire by e-mail and remaining 61 sent through surface mail which calculates 88.

Data Analysis:

Data were analyzed using frequency count and percentages by descriptive analysis and was analyzed by MS Excel 2007. All data were placed on table to interpret appropriately.

Result:

Based on the responses of 88 teacher educators, the results and findings are presented here in brief description and in tables.

Demographic information:

In the sample of 88 teacher educators 72 (82%) were males and 16 (18%) were females. Of them, 51 (58%) have M. A/M. Sc./M. Com degree accordingly 34 (39%) have M. Ed, and only 2 (2%) teacher educators have PhD degree with the remaining 1 (1%) have other degree.

Respondents were divided into five age groups. Most of the teacher educators were in 41-45 age group which accounts 36 (40%) and the less was 4 (5%) in 46-50 age group. Others were 22 (25%), 18 (21%) and 8 (9%) in age groups 31-35, 36-40 and 51 & above respectively.

Three research questions focused in this current study. According to the research questions, following statistical analysis were made.

Research Question - 1

Which ICTs do teacher educators' have access to in their colleges and what is the frequency of their access per week?

Table 1 presents the types of ICT facilities in which teacher educators' have sufficient access. It explored that almost all 87 (99%) teacher educators have access to computers. It also displays that 85% teacher educators' have access to e-mail and internet, 74% to digital camera, 41% to scanner, 32% to video equipment, and 24% have access to data projectors.

Teacher educators' frequency of access to ICT has presented in table 2. The study revealed that one-third teacher educators have 0-5 hours access per week to ICTs in their colleges. It also exposes that 23 (26%) teacher educators have 6-10 hours access per week to computer that positioned 2nd while a good number of teacher educators' have more than 21 hours access per week to computer which counts 18 (21%). But only 13 (15%) and 6 (7%) teacher educators' have 11-15 hours and 16-20 hours access to ICT per week respectively.

Table 1 : Teacher educators' access to ICTs

ICTs	No. of response	%
Computers	87	99
E-mail	75	85
Internet	75	85
Digital Camera	65	74
Scanner	36	41
Video Equipment	28	32
Data Projector	22	25

Table 2 : Teacher educators' frequency of access to ICT

Access to ICT/week	No. of response	%
0–5 Hours	28	32
6–10 Hours	23	26
11–15 Hours	13	15
16–20 Hours	6	7
21 Hours & above	18	21

Research Question - 2

What is the adequacy and availability level of ICT in teachers' training colleges?

Teacher educators rated the various aspects of adequacy and availability level of ICT in their colleges on a five point Likert-type scale and results presented in table 3.

No consistent portrait has seen from table 3 regarding adequacy and availability level. A very little number of teacher educators reported 'very good' and 'very poor' in respect to availability of different ICT that ranges from 2 to 20. Nearly one-third teacher educators have good access to internet and software which considers little in amount. However, ICT technical support and access to Data Projector and Digital Camera reported satisfactory by 35 and 32 respondents respectively. On the other hand, 29 teacher educators reported poor in access and adequacy on computer hardware.

Table 3 : Adequacy and availability level of ICT

Sl.	Items	Very Poor	Poor	Satisfactory	Good	Very Good
1	Computer Hardware	11 (13%)	29 (33%)	15 (17%)	24 (27%)	9 (10%)
2	Software	10 (11%)	14 (16%)	28 (32%)	29 (33%)	7 (8%)
3	Computer Consumable	4 (5%)	19 (22%)	31 (35%)	26 (30%)	8 (9%)
4	ICT Technical Support	10 (11%)	13 (15%)	35 (40%)	23 (26%)	7 (8%)
5	Internet Access	2 (2%)	15 (17%)	19 (22%)	32 (36%)	20 (23%)
6	Others (Data Projector, Digital Camera etc.)	7 (8%)	18 (20%)	32 (36%)	20 (22%)	11 (13%)

Research Question - 3

What are the factors hindering teacher educators' readiness in using ICT?

Teacher educators' identified factors hindering their readiness and confidence of using ICT and results presented in Table 4. It exhibits that the main factors hindering teacher educators' readiness of using ICT are "lack of expertise with ICT" and "insufficient knowledge of appropriate softwares" which accounts 53 (60%) and 48 (55%) respectively. In addition, 40 (45%) teacher educators identified "insufficient knowledge of how to use ICT equipments", 35 (40%) identified "lack of knowledge of how to evaluate the use and the role play by ICT in teaching and learning", and 27 (31%) identified "lack of confidence in using ICT".

Table 4 : Factors hindering teacher educators' readiness of using ICTs

Items	No. of response	%
Teachers' lack of expertise with ICT	53	60
Lack of confidence in using ICT	27	31
Insufficient knowledge of appropriate software	48	55
Insufficient knowledge of how to use ICT equipment	40	45
Lack of knowledge of how to evaluate the use and the role play by ICT in teaching and learning	35	40

Discussion & Findings:

The demographic information shows that participants were well balanced in respect to age. Most of the participants were having M. A/M. Sc./M. Com degree and all other have a kind of tertiary level education that is line up with the OECD report 2001. The data explains that participants were from diversified background and were spread over in homogeneous set-up. So, it can be inferred that the sample was consistent.

Regarding access to ICT, the result shows that teacher educators have more access to computer, e-mail but have very limited access to the scanner, video equipment and data projector. This result differs from the study of The Robert Gordon University Aberdeen (2004) since it described that big proportion of teacher educators have good access opportunity to ICT equipments in their colleges. Consequently, it is understood that teachers' training colleges of Bangladesh are moderately equipped with ICT which confirms the study of Gillwald, Milek, & Stork (2010) as the teachers' training colleges has not good and equitable access facilities to ICT.

As well, an unpleasant picture has seen in connection to frequency of access to ICT. Right away, it learned that teachers' training colleges are moderately equipped with ICT. But, it has revealed that frequency of using computers per week by teacher educators' is not satisfactory. More than a half of teacher educators are using ICT less than 11 hours per week and only one-fifth uses ICT above 21 hours per week. This depicted that around 80% teacher educators' are using ICT in the rate of less than 3 hours per day. This result indicates that teacher educators' are moderate level ICT users. It confirms the opinion of Gray and Souter (2004) as actual level of use was quite low while the availability of computer facilities in teachers' training colleges was evidently average. As opined

by Gray and Souter (2004) it is due to teachers' lack of interest and lack of enthusiasm whenever the ICT equipments are made available in their reach. Availability and presence of ICT equipments can motivate teacher educators to get access to those facilities. To increase the rate of access to an expected level, there is no alternative way but to motivate them by training, tangible reward and promotion.

On the other hand, respondents rate on adequacy and availability level of ICT on a five point Likert type scale evident that moderate number of teacher educators' has access to internet, computer consumable, data projector and digital camera, and softwares. In contrast, teacher educators' have very limited access to computer hardware and technical assistance. This result indicates that computer hardware, softwares and technical support are less available and lacking in comparison to other facilities. Even though it happens in their colleges, this is not so important for the teacher educators' and a minimal skill in this area can provide an additional confidence in using ICT. The overall level of using ICT depends on level of motivation as this facet is justified by the report of The Robert Gordon University Aberdeen (2004). In this report, it is mentioned that teacher educators' reasonably confident in using ICT if more support and professional development can be ensured. And this premise further supported by the study of Gachago et al., (2007) which explains that support staffs should charged with the responsibilities of providing assistance to the teachers that endorsed by Rudd et al., (2009) study.

Hence, an inference can be drawn that level of use of ICT in instructions by the teacher educators' depend on their level of motivation and professional development as an effective interventions. In addition, some may have ICT phobia and are afraid of using ICT. This finding is justified by a study on e-learning conducted by Gachago et al, (2007) at University of Botswana. The e-learning support staffs were charged with the responsibilities of providing assistance to the teacher on how to teach their students through this medium and how to train those who don't have knowledge of teaching through ICT. So, continuing professional development support for a number of ICT activities, including using learning platforms is needed (Rudd et al., 2009). Authors also informed that it may needs to be supported with face-to-face guidance, encouragement, and possibly training. Teachers and learners need to be fully informed about how they can make optimal use of the various dimensions of learning platforms. Besides, the Becta (2009) review

articulated funding for continuing professional development (CPD) to have an integrated technology which described as important predictor of e-maturity.

Likewise, in association to factors hindering using ICT, several issues appeared in considerations. All of the participants have tertiary level education. So, education is not a factor of hindrance of readiness in using ICT as it mentioned by Gillwald, Milek, & Stork (2010) and OECD (2001). Moreover, females were calculated very less as why the result does not influence mostly while females reported less access and use ICT though men and women share similar backgrounds described in preceding study.

Furthermore, the finding exposes "the lack of teacher educators' expertise" and "lack of knowledge of appropriate software" are the two major important hindering factors of teacher educators' to readiness and confidence in using ICT. "Insufficient knowledge of how to use ICT equipment" and "lack of knowledge of how to evaluate the use and the role play by ICT in teaching and learning" is the consequence of appropriate ICT knowledge. In reality, the major cause of their poor confidence is lack of appropriate ICT knowledge that can be intervening through need based training (Hawkins, 2002). It is clearly depicted that generic ICT skills training and software specific training are need for teacher educators to make them confident in using technology that promulgated by Hawkins (2002). Similarly, the relevant study of JISC (2004) on techniques of developing ICT skill revealed that the most important factors identified teacher's lack of knowledge in ICT use and ICT skill in general. This is because of newly ICT introducing in teachers training colleges in Bangladesh.

Conclusions:

From the study it is illuminated that all the teacher educators of teachers' training colleges of Bangladesh are not using ICT at satisfactory level. Internet access and pertinent infrastructure has already been developed by this time across the country. Teachers' training colleges should be equipped with ICT infrastructures at a certain level as ICT and related issues changes rapidly. But lack of complementary policies and interventions need to integrate ICT in education taking initiatives for increasing and sustaining access level to ICT by the teacher educators. Apart from these, some kind of motivational factors like empowering of teacher community, performance based reward system, merit based

promotion should be considered. are some complimentary issues to integration of ICT in teaching and learning process of teachers training colleges of Bangladesh.

According to findings, ICT equipments must be provided at the premises of the colleges for the best uses. ICT technical support, computer software and hardware should be bestowed within the reach of all teacher educators' and trainee-teachers of teachers' training colleges of Bangladesh. In addition, an initiative should be taken to train, re-train teacher educators phase by phase on the basis of need assessment. This must be in the form of continuing professional development (CPD) for enabling teacher educators to keep in touch with ICT developments, new knowledge and research on teaching and learning with the appropriate pedagogical aspects. So, funding for ICT CPD and ICT facilities is recommended to have an integrated technology in teachers' training colleges which can be initiated by Ministry of Education or any other mechanism that may be an issue of further study.

Lastly, making all the ICT facilities and providing training are not the only issues which can ensure ICT integration in class room instruction rather effective monitoring and follow-up mechanism are two obvious measures that must be ensured. Simultaneously, reward system for ICT based outstanding performance must be ensured and constraints for sub-standard performance must be undermined.

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