

Analysis of mobile device utilization for teacher development - Focus on primary school teachers in Bangladesh

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Abstract: The purpose of this research is analyzing mobile device utilization for teacher development in Bangladesh. The government is promoting IT in various administrative services as well as in education. However, amount of equipment is still in shortage, and teachers do not understand how to use it such as PC. On the other hand, mobile device such as smartphone is prevalent, and many teachers possess it. In this paper, effect by using mobile device in education will be discussed for enhancing teacher development. As a result, it is evident from interview that teacher used it for autonomously learning to find contents not understood through internet. In addition, it became clear that teacher used tablet for showing picture not relying on textbook illustration to promote thinking in science lesson.

Keywords: Primary school teacher, Teacher training, ICT in education, Educational media, International Cooperation in Education

INTRODUCTION

According to “vision 2021” has been issued by Bangladesh government as a manifesto in 2013, they created a slogan called “Digital Bangladesh” for the reduction of disparities caused by wealth and distance (Access to Information Programme Prime Minister’s office, 2009). Accordingly, they provide ICT equipment such as PC, projector for primary schools. However, amount of equipment is still in shortage, and teachers do not understand how to use it such as PC. Instead of using PC, mobile devices such as smart phone and tablet are increasing among teachers in their daily life. Hence, the teachers can use mobile devices. It means they can use equipment autonomously without training for utilizing mobile devices.

In the academic field of ICT in education in Bangladesh, International Conference on Digital Education (ICDE) has been established since 2015. Its study has being done on present-day e-learning or ICT based teaching in higher education, but little research has been conducted on mobile device usage in primary education.

Therefore, this research will find out that improvement of teacher development by using mobile device in primary school.

LITERATURE REVIEW

Possession Rate of Mobile devices

The increase in the global use of mobile devices has also accelerated transformation. According to the statistics provided by International Union of

Telecommunication (2014), approximately seven billion people have contracts with a mobile phone, and this number is equal to 95.5% of the world population (Mobithinking, 2014). In recent years, there has been a huge increase in tablet computer sales. According to International Data Corporation (IDC) (2013) report, tablet shipments will grow 58.7% in 2013 reaching 229.3million units, up from 144.5 million units in 2012. In the case of Bangladesh, the people have a contract with a mobile phone is over 80% of the population (International Telecommunication Union 2015). These studies suggest that utilization of mobile devices in education in Bangladesh is highly feasible.

Educational Improvement by Mobile Devices

In the present study, a mobile learning system is used for the professional development of academics. Mobile devices because these are appropriate technologies to do research, engage in instructional activities, achieve institutional objectives and conduct new approaches in education (Hamm, Drysdale and Moore, 2014). Mobile technologies, which allow access to information in any place and at any time, and which provide learning opportunities while mobile can be used for professional development purposes (Sharples, 2000). Nilgun and Abdull (2015) designed “Mobile Academic Research Support (MARS)” to develop not only learners’ skills in the use of information and communication technologies in higher education, not only to examine the perceptions and experiences of academics using the system. It was developed by design-based action research for tackling actual problems. More focusing on teacher development, the paper by David (2014)

showed that mobiles' potentials and teachers' challenges. For examples, mobiles' potentials are mobility lower demand in electricity supply and more durable, embedded networking through phone calls, SMS, and mobile networks, integrated knowledge creation such as photo, video and audio. In addition, teachers' challenges are shortage of subject knowledge worsened by no access to teaching content, weakness in teaching methodologies, poor pre-service training especially in terms of developing countries. In his research, he mentioned that in resources-scarce setting, mobiles enhance teachers access to relevant teaching content and develops their content knowledge. In the case of Bangladesh, Kamidate (2017) pointed out one of the NGO school in Bangladesh have no teacher training. In addition, the teachers do not have enough learning materials such as teachers guide for improving their lessons. For these reasons, it is thought that utilization of mobile device for teacher development is effective for Bangladeshi teachers.

ICT in Education

ICT utilization has been studied in terms of media education. As Bernard (1995) pointed out that technologies such as ICT were usually simply added to class, not really integrated. For the problem, he said that teacher education was needed including development educational knowledge acquisition, and professional and pedagogical competencies in terms of ICT utilization in education. In the case of Bangladesh, some websites developed for teachers' learning, including lesson plan made by PowerPoint, picture, video content, and audio files, etc. (e.g. Shikhhok Batayon <https://www.teachers.gov.bd/>).

On the other hand, Alam (2009) argued that the problem of science education in Bangladesh. He said Bangladeshi teachers cannot inspire the serious and meritorious students to take up science for their higher studies. As a result, enrollment in secondary and postsecondary science has steadily fallen over the last 10 years. McFarlane & Sakellariou (2002,p.230) said, "To speak of the role of ICT in science education it is necessary first to identify the objectives of that education and then disaggregate the various forms of ICT in order to discuss the potential relevance or otherwise of each." Figure 1 shows a model of the iterative process of science lesson that can be used ICT tools in science with some examples of actual utilization of ICT (McFarlane, 2000). It is used for ICT teacher training offered through the national initiative to train all science teachers in the use of ICT in subject teaching in UK. As Figure 1 indicates, each three scientific skills such as (i) ask questions, predict and hypothesis, (ii) observe, measure and manipulate variables and (iii) interpret their results and evaluate scientific evidence are used different way of ICT utilization. However, this study

has been not paying attention to utilization of mobile device.

Therefore, mobile device utilization based on teaching contents also must be discussed.

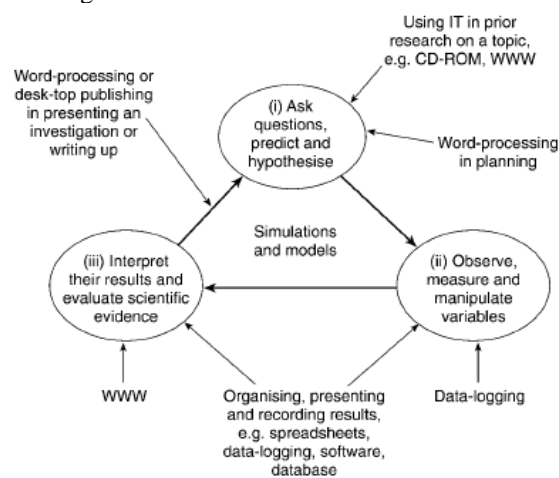


Figure 1. A model of the iterative process of science using ICT

Therefore, it is important that how teachers integrate ICT tools such as mobile phone and tablets into improvement of education in Bangladesh is discussed more related to science education.

RESERCH DESIGN & METHODS

The purpose of this research is to analyze mobile device utilization for teacher development in Bangladesh focusing on science lesson.

Target group

This reach is a part of analysis of teacher developing program. The project purpose is "Thorough training in Japan and the distance mode by utilizing ICT, selected teachers of (name of target NGO) can acquire teaching skills on how to use revised textbooks which will strengthen thinking ability of the pupils of (name of target NGO)". This is conducted by a Japanese NGO since 2017, and there are three components of training.

- e-learning training
- Face to face training in Japan
- Face to face training in Bangladesh

This target are the NGOs' 13 teachers in Dhaka city. The NGO have 20 teachers in 4 schools, and no training regularly. Bangladesh primary school textbook changed in 2015. However, the NGO teachers have not received teacher training about new textbook. In Bangladesh, science lesson starts grade 3. Thus, the participants were selected 13 teachers who teach science. In this training, teachers are distributed one tablet per person for e-learning training. In addition, the teachers had not receive e-learning materials by this research, means they only have

tablet unless training materials. So that, we can focus on teachers' intention to use tablet.

Research method

There are two parts research : Study1 and Study 2. In study 1, is analysis of PowerPoint contents on "Shikkhok Bhatayon" is educational portal site in Bangladesh, to investigate teachers need and interest for using ICT. Because the contents are developed and uploaded by teachers.

In study 2, two kinds of the research methods are taken in this paper to analyze actual usage of mobile device in class. One method class observation to find for what teachers used ICT and the how students reacted. The number of lessons is 13 lessons. We observed directory and shot by video. The second is interview the teachers to investigate the reason why they used ICT in the lesson context.

As a consequence, this research considers the findings how teachers be able to apply mobile device for development lesson and teacher by three points of view based on McFarlanes' model.

RESULT

Result of Study 1

Table 1 shows the number and content of materials in science in Shikkhok Bathayon. From this, it is cleared that teachers have needs and interests in the content on food and the contents on resources. Regarding the grade level, it is found that the number of content increases as the grade rises. The contents are made as a lesson plan, about 70% are photographs, the remaining about 30% are letters and sentences. For this reason, it was found that it is supposed to be made for the (ii) of McFarlanes' model such as observation. In these lesson plans, the teacher of these lesson plan was not planning to use other ICT equipment during the class.

Table 1. Number and content of materials in science

Grade	Number	Content
Grade 3	5	food (3), resource of water (1), plant (1)
Grade 4	6	health (2), food (1), plants and animals (1), plant (1), animal (1)
Grade 5	11	natural resource (4), environment (2), technology (1), health (1), rock (1), water (1), plant (1)

Result of Study 2

Lesson ocservation

It is found from the class observation that 2 out of 5 teachers used tablets during class and showed pictures to children. Learning activities part of using tablet were introduction part or summary part. The teacher who used for introduction part to show students photos, and then used it for activities that make the students think about what kind of things are in the pictures

The teacher who used tablet for summary, when entering the summary of the learning activity, showed pictures taken around the actual school and used to relate the learned contents to daily life.

In other countries, ICT equipment sees examples of using tablets as an activity of shedding music or sound and taking pictures of students output, but we did not observe such activities in Bangladesh. There was no problem with teacher 's use of the tablet, and the equipment could be used smoothly.

Teachers Interview

According to the results of the teacher interview, the teacher who used for introduction said that she used tablets to attract interests of students.

The teacher who used to summary part answered that they used the tablet so that the learning contents are easier to understand for children, specifically to make images easier to understand.

In addition, we asked teacher when teachers using tablet outside classes, 2 teachers answered, "I would search on the Internet when I had something I did not understand teaching content". In addition, when the pictures and illustrations written in textbooks are difficult to understand and see, they answered that they downloaded pictures on tablets to show students. In addition, it is cleared that teachers used to record not only own class but also other teachers class observation.

CONCLUSION

From Study 1, it was found that some of the teaching materials being uploaded to Bangladesh's portal site is supposed to apply to lesson. Because it can be used on mobile devices due to constructed by many pictures. However, because ICT utilization in various activities such as recording of student' note taking not assume. Thus, it is needed a lesson plan that including variety of utilization of mobile device is necessary. Regarding contents of digital teaching materials, there are many teaching materials on health and the environment. It also found that there is a need for biological fields. In Japan, ICT teaching materials are often used in the field of geology because it is difficult to show the actual thing. The reason why teachers in Bangladesh are not making lesson plans in

the field of geology may be that the materials for making lesson plans are not enough and that teaching materials with movement can not be made by teachers. Therefore, these contents are needed to develop various digital materials.

From study 2, it turned out that some teachers thought and practiced the method of tablet utilization on their own initiative in the class. In addition, teachers used tablet to search teaching method or to find teaching materials picture for developing teaching. However, Bangladeshi teachers prefer to use only picture, they did not use sound or movies. One reason for not using music is thought to be that the classroom is very noisy from outside school, sound is difficult to hear. Therefore, for preparing teaching materials by using mobile device for using in class, it is better to create visual teaching materials compare to sound.

Although it is not the main subject of this study, it is suggested that the message by facebook may lead to teacher's motivation in the interaction with the teacher. In this study, we asked the current situation of teachers and schools through facebook, Then, some teachers independently sent photographs of classes and state of students from the teacher, and some teachers actively trying to contact the program implementer side. Frequently, learning engagement is an issue in e-learning. As one of the methods, BBS (Bulletin Board System) function that enables learner to interact with each other and teachers is recommended. Therefore, the BBS have important role for remotely intervention for Bengali teachers. In addition, the fact that teacher independently sent photographs of classes and state of students to program implementer suggested the possibility of being applicable to monitoring in teacher training.

Based on the overall results, it can be decided that it is possible to intervene in education improvement using mobile devices in Bangladesh. In addition, the possibility of teacher 's autonomous learning is suggested.

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