THE IMPLEMENTATION OF ICT BASED EDUCATION IN ELEMENTARY TEACHER EDUCATION (PGSD) IN INDONESIA

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ABSTRACT

In fact, Information Communication and Technology (ICT) have been utilized in schools even though relatively small in numbers. At present, there is a program for Elementary Teacher Education called PGSD program in Indonesia. The PGSD program is an in-service teacher training program especially for elementary school teachers in Indonesia, to improve their qualifications from Diploma-2 to Strata-1 level, conducted through ICT-based distance learning mode. This study uses survey method to examine the accessibility of ICT infrastructure and networks, and the effectiveness of using ICT for teaching and learning in six university member of PGSD program in Indonesia. The results of the study show that the PGSD program needs to improve the ICT infrastructure and networks as well as apply ICT based teaching and learning skills.

Keywords: ICT, ICT readiness and utilization, blended learning, PGSD in-service teacher upgrading program

INTRODUCTION

For higher education institutions to fulfill their role as incubators of knowledge and for elementary, secondary and tertiary students to acquire and use knowledge in the 21st century, they need to be connected with the world through Information, Communication and Technology. To achieve the ideal situation, the cost of internet access must be affordable and equitable across diverse socio-economic sectors of society. The National education Strategic Plan stated that ICT literacy rate among lecturers and students in higher education by 2009 is expected to achieve 80% and 50% respectively. ICT literacy includes proficiency in the utilization of computer and related programs. Teacher education institutions should also reform their curricula by integrating ICT into teacher education programs to increase ICT competencies. (Brodjonegoro, 2006)

To overcome the problem of restricted connection and bandwidth as well as high cost internet access, Ministry of National Education has developed cooperation with Indonesian Telecommunication Company (Telkom) to offer JARDIKNAS programs for school communities. In fact, ICT has been utilized in schools even though relatively small in numbers. More and more internet kiosks, not only at the post office in capital cities in the provinces but also in the districts, are available. The community has also participated in the establishment of internet kiosk. The number of schools using the internet is also increasing.

At present, in Indonesia there is a program for Elementary Teacher Education called PGSD program. The PGSD program is an in-service teacher training program especially for elementary school teachers in Indonesia, to improve their qualifications from Diploma-2 to Strata-1 level, conducted through ICT-based learning mode. The HYLITE program utilizes distance learning mode and is offered by the consortium of 23 universities.

So far, there is no study examining the ICT infrastructure and its utilization in the universities which are members of HYLITE Consortium. In order to gain information regarding the ICT infrastructure and utilization in Teacher Education Institutions, the SEAMEO SEAMOLEC and USINTEC (United Stated/Indonesia Teacher Education Consortium) conducted ICT utilization study in selected Teacher Education Institutions.

This paper will describe the condition at six institutions offering the PGSD program, in term of the ICT infrastructure and utilization, in attempt to reach the National education Strategic Plan of 80% ICT literacy by the lecturers and students in higher education. The study is supposed to come up with recommendation and action plans to accelerate the ICT utilization to support the PGSD program in those institutions or other institutions that wants to participate in distance or blended learning programs.

The ICT utilization study in six Teacher Education Institutions offering PGSD program in Indonesia is to strengthen institutional capacity of Elementary Teacher Education (PGSD) in Indonesia. In detail, the objectives are to assess the existing ICT infrastructure facilities access in in-services teacher training program, especially in PGSD program and to assess the ICT utilization readiness for the lecturers of S-1 PGSD in PGSD program.

Information and communication technology (ICT) generally relates to those technologies that are used for accessing, gathering, manipulating and presenting or communicating information. The technologies could include hardware e.g. computers and others devices, software applications, and connectivity e.g. access to the internet, local networking infrastructure, and video conferencing (UNESCO, 2003)

UNESCO cited the study of Morsund (2003) that provides the range of technology for ICT in more details. First, the full range of computers hardware, computer software, and telecommunications facilities. Second, computing devices ranging from handled calculators to super computer. Third, the full range of display and projection devices used to view computer output. Fourth, the local area network and wide area networks that allows computer systems and people to communicate with each other. Fifth, digital cameras, computer games, CDs, DVDs, cell telephones, telecommunication satellites, and fiber optics. Sixth, computerized machinery and computerized robots. (UNESCO, 2003)

ICT utilization means the using of ICT for word and data processing, presentation, email and internet browsing by the lecturers for teaching. This paper describes the study on the lecturers' utilization of ICT for teaching and learning purposes, for example, utilizing computer programs such as Microsoft word, spreadsheet, Power Point, email and internet. The study does not go into such detail as finding out the detail of ICT utilization such as for production purposes or classroom management.

There are various stages in integrating ICT into the school community and in learning about ICT as well as for effective use of ICT in teacher education, they are emerging, applying, infusing and transforming stages. Emerging means that administrators and teachers are beginning to explore the potential of ICT. Applying means teachers may be using computers for words processing, databases and to explore subject-specific software. Infusing means that a variety of ICT tools are being used and ICT is becoming integrated into the curriculum. Transforming involves a major reconstruction of the classroom into one that is learning-centered and where ICT is used to explore a variety of real-world problems. A transformed classroom is an inquiry-oriented learning environment (UNESCO, 2003).

Gaible, Edmond and Burns (2005) stated that computers raise many concerns among teachers, including: (1) Technical concerns, example "How do I use the computer?" (2) Functional concerns, example "What can computers help me do?" (3) Logistical concerns, example "How can I use so few

computers with so many students?" (4) Affective concerns, example "Will these computers replace me as a teacher? Will my students lose respect if they think the computer knows more than me?" (5) Organizational concerns, example "How do I organize my classroom to support the use of computers? How can they be used as part of what I already do in the classroom?" (6) Conceptual concerns, example "How can I learn from and with computers?" (7) Instructional concerns, example "How can computers help my students learn in different ways? How can they support the curriculum? How can they support my teaching? How should I teach using computers?" (8) Evaluation concerns, example "How do I assess student learning in computer-based projects? How does this new way of learning fit with national exams?"

The ICT plays an important role in ensuring quality of education through the improvement of access and promote equity in education, efficiency of education management, and quality of teaching and learning (UNESCO, 2005). The conditions of ICT utilization in education has been studied by UNESCO. An examination of countries in the Asia-Pacific region has shown that ICT is not being used to its full potential in enhancing the quality of teaching and learning. There are both technical and capacity-related barriers that have to be overcome. Many countries of the region do not make use of ICT at all in their education system due to technical barriers such as lack of infrastructure, equipment and internet connectivity. ICT is used simply as a supplement for existing pedagogical practices. In order to fulfill the potential of ICT as a tool for enhancing teaching and learning, ICT must be fully integrated into pedagogical processes, which requires a cognitive shift on the part of policy makers, educators, curriculum developers, and administrators (Tatang, 2007)

A survey by SEAPREAMS in eleven Pacific countries has identified five main barriers in implementing ICT program in schools that are physical obstacle like remoteness and an unreliable electricity supply, scarcity of fund, lack of staff development, insufficient and inappropriate software, and the speed of technological development (UNESCO, 2003). The findings from Poon (2013), indicated that teachers who intend to use blended learning in the future, it is suggested that the teaching style should be kept simple, but that the individuals must be prepared to be experimental. Different modules and courses require different forms of blended learning to suit the course, the content, and the students' needs; therefore, having a flexible approach is important. The study by Jeffrey, Milne, Suddaby& Higgins (2014) concluded that the emergence of blended learning is a major trend in tertiary education. This trend is being fueled by the accumulation of evidence that points to the efficacy of a blended approach over either online or classroom alone. However, there is a danger that blended learning courses will fall far short of the potential if teachers do not change their attitudes and practices to developing blended experiences.

In Indonesia, there is a training program for teachers called PGSD. PGSD program is an in-service teachers training program, especially designed for primary school teachers, to improve their qualification from Diploma (D-2) to Sarjana (S-1) level, conducted via open and distance learning mode. It is one of the delivery mode taken by Minsitry of Education, in providing access for quality education for all, especially for primary school teachers in all areas in Indonesia. It is designed for primary school teachers aiming to especially upgrade their competencies and qualification through a continuing process of education with a lifelong learning spirit. Specifically, the PGSD Program is an innovative program to overcome the issue of scarcity of quality primary school teachers, especially through the extensive use of ICT-based learning (Pannen, Riyanti, and Pramuki, 2007).

The PGSD program model is developed and implemented by distance learning or blended learning model. Blended instruction is defined as the appropriate mix and use of face-to-face instructional methods and various learning technologies to support planned learning and foster subsequent learning outcomes (Lim & Morris, 2009). The PGSD blended learning model can be seen in the following figure.
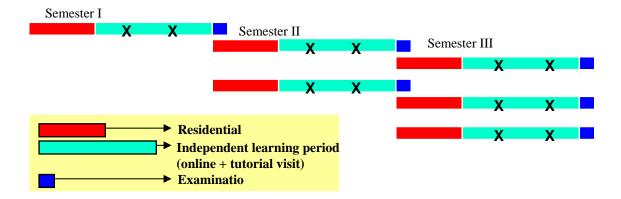
Figure 1 PGSD Program Model

The PGSD program employs one curriculum for the 23 consortium members, with the load of 82-credit semester. Those credits include the professional and physical education courses. The PGSD program utilizes the distance or blended-learning model, which is the combination of residential and independent learning. The distance learning mode employs in blended delivery system, such as residential program and independent learning using print, web-based, and multimedia to accommodate the teaching and learning activities. The PGSD program is supported by ICT owned by each of the consortium member institution.

The residential program is conducted for one month at the beginning of each semester. During the residential period, the students will be engaged in various tutorial activities, including laboratory works, and sit in the examination for the previous semester. After the residential program, the students will go home and study independently using the available learning resources. The web-based courses and facilitation of the learning process are accessible through the ICT centers and internet facilities. The facilitation of students' learning process is provided through the online interaction utilizing five online interaction within five months of the semester, and or synchronous interaction in the form of teleconference once every semester; such as group discussion forum and video conferences.

Based on monitoring and evaluation, it is found out that PGSD program has been seen to have several benefits, among others, teachers can upgrade their qualification without leaving their daily jobs in schools, teachers (as well as lecturers and administrators of PGSD program at the teacher colleges) can improve their ICT literacy and skills, teacher colleges can improve their collaboration and mutual acknowledgement to implement the PGSD program. (Pannen, Riyanti and Pramuki, 2007)

METHODS

The method of the study is survey using questionnaire, observation and interview techniques. The instruments was developed and modified from available instruments to meet the objectives of this study. The survey includes question items to establish and document the current ICT infrastructure and utilization in PGSD program. The ICT utilization study was conducted on August 2007-2008. Small team was assigned to conduct the assessment at each of PGSD member universities. The team consists of Instructional Specialist, Content Experts and ICT specialists. The responses are collected directly on site at the six universities in PGSD program.

Problem statement includes to what extend the access of ICT infrastructure and network facilities for lecturers support ICT based learning and to what extend the effectiveness of ICT infrastructure and utilization in PGSD program towards the ICT based learning. Respondents are all

lecturers of the six universities members of PGSD program offering S-1 PGSD program, they are Universitas Negeri Semarang, Universitas Negeri Yogyakarta, Universitas Negeri Malang, Universitas Negeri Makassar, Universitas Pendidikan Ganesha, and Universitas Negeri Gorontalo.

RESULTS AND DISCUSSIONS

Data was gathered from the lecturers of six universities in PGSD program. The total number of respondents was 93 (55 males and 36 females). The data distribution of age was 12 persons under 30 years; 42 persons between 30 to 50 years; and 39 persons over 50 years old. Educational level of these respondents was 23 persons S-1; 56 persons S-2; and 14 persons S-3. The length of using computer was also difference: 12 persons less than 1 year, 11 persons between 1–2 years, 7 persons between 3-4 years, and 56 persons more than 5 years.

The data of lecturer's capability in using ICT software particularly offices application such as word processing, spread sheet, power point, e-mail, internet, and statistical tools are shown in Table-1. The capability in using ICT software (office applications) is categorized as capable is regarded as good, very good and excellence while the rest are not capable.

Table 1 The Capability in Using ICT Software

No.	Office Application	Capable (%)	Not capable (%)
1	Word processing	43.8%	56.2%
2	Spreadsheet	71.0%	29.0%
3	Powerpoint	58.8%	41.2%
4	E-mail	58.0%	42.0%
5	Internet	29.3%	70.7%
6	Statistical tools	37.9%	62.1%

The data analysis of PGSD program lecturer capability in using ICT software (office applications) as shown in Table-1 indicates that the capability of lecturer in using word processing is relatively fair (43.8%), spreadsheet is very good (71%), power point is good (58.8%), e-mail is good (58%), internet is fair (29.3%), and statistical tool is fair (37.9%). Based on the observation and interview data in each university, the university generally has already had ICT infrastructure. The computers were already connected to the local network and internet. However, there was an exception that PGSD program did not have access to these equipment and facilities. This fact might be the cause of the lack of capability in using office applications in teaching and learning activities.

The use of ICT by lecturer of PGSD program in teaching and learning activities including teaching specific subject, finding and accessing information and educational materials, making presentation and lecture, preparing lesson, communicating with students, and preparing reports are shown in Table 2. The utilization of ICT which is categorized as using ICT is regarded as often and very often in using ICT in teaching and learning, while not using ICT is regarded as seldom and never using it as seen in the following table.

Table 2 The ICT Utilization for Teaching-Learning Activities

No	Activities	% of Using ICT	% of Not Using ICT
1	Teaching-learning specific object	20.0%	80.0%
2	Finding and accessing information and educational materials	31.4%	68.6%

Table 2 The ICT Utilization for Teaching-Learning Activities (continued)

No	Activities	% of Using ICT	% of Not Using ICT
3	Making presentations and lecture	40.3%	59.7%
4	Preparing lessons	27.9%	72.1%
5	Communicating with students	24.3%	75.7%
6	Preaparing reports	25.8%	74.2%

Table 2 shows that it is still far from the target of the National Education Plan in 2009 that 80% of lecturer should have ICT literacy. In fact, only 20% of the lecturer used ICT in teaching specific courses and 31.4% used ICT in finding educational materials. In face-to-face lecturing, presentation of materials is important. By using good presentation, many things can be done effectively. Time consumption in writing on the white board can be reduced and students can focus their attention to the presentation. However, data shows that only 40.3% of lecturers used ICT in their class presentation.

ICT can be utilized by lecturers in preparing their lessons. When the material is already prepared, lecturers can optimize the use of time in the class with the students. The data shows that only 27.9% of lecturers used ICT in preparing their lessons. In PGSD program, one mode in delivering course materials is by using e-mail. Lecturers should using e-mail in corresponding to their students or vice versa. However, only 24.3% of lecturer used ICT in communicating with students. As lecturers, they have to make reports for some activities, either for class activities or for research activities. It can be seen that only 25.8% of lecturer used ICT in preparing reports. The rest of respondents probably just asked other people to write the reports for them.

CONCLUSIONS

As far as the ICT utilization in PGSD program is concerned, there are several improvement needed for lecturer, particularly the capability in ICT literacy, ICT software utilization, as well as integrated ICT based-education of the PGSD program. The PGSD program is still in the position of applying stages. This means that the lecturers and staffs of the universities of PGSD program have to learn more about how to use ICT. The ICT utilization of lecturers in PGSD program remains below average. Therefore, there will be a lot of training and motivation needed to improve ICT literacy for lecturers as well as technical supporting in the implementation of ICT based learning. The ICT utilization should be focused on improving teaching and learning activities for PGSD program.

This result of the study concluded that lecturers of PGSD program have average capabilities in utilize the word-processing, Power Point, and spreadsheet, and email. The lecturers gradually developed the abilities to adapt the demand of ICT-based distance learning system, i.e.: utilizing internet to communicate to the distance learners and using the spreadsheet to manage large amount of data from the students' assignments. The PGSD program necessitates for the lecturers to connect with students at anytime and anywhere. It means that each lecturer should develop capability in e-mailing and send the initiation materials to all students who participate in his/her course. They also need to develop the capability to utilize internet to help students in using the web-based course materials or to provide references to answer students' questions.

In order to improve the ICT infrastructure and utilization in the PGSD program in the future, it is recommended that the program do as follows: (1) the ICT infrastructure including software, teleconference and web based learning facilities, should be upgraded according to the numbers of lecturer's needs for implementing ICT based learning. (2) University's staff for ICT specialists'

development, ICT instructional design development, ICT content based development should be added more. (3) Training and mentoring for S-1 PGSD lecturers and students in implementing and using ICT should be improved. (4) The utilization of ICT to support academic program, collaborative research, and to share the teaching experience of field experience practice should be distributed. (5) ICT literacy and English language capacity for lecturers, staff and students should be improved.

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