

Using Educational Technology to Enhance Learning for In-Service Primary Teacher Education Students at Universitas Terbuka, Indonesia

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Abstract

This paper addresses the use of educational technology to enhance learning for in-service primary teacher education students at Universitas Terbuka (UT), Indonesia. The discussion begins with background, introduction, and issues pertaining to in-service primary teacher education, particularly as it is applied to UT in Indonesia. It further addresses teaching, learning and operational support for in-service primary teacher education at UT. The use of educational technology for in-service primary teacher education is discussed in terms of what kinds of technology is used, how technology is used, how in-service primary teachers benefit from the use of educational technology, and how primary teachers use the technology in the classroom. The paper concludes that educational technology enhances the distance learning process of primary teachers, and the teachers adopt the use of educational technology in their daily teaching activities in the classrooms. Educational technology will be more increasingly used to assist students' learning and support institutional management and instructional system, particularly in distance education.

Background, introduction, and issues

This paper is all about the use of educational technology to enhance learning for in-service primary teacher education students at Universitas Terbuka (UT), Indonesia. And we would like to begin this paper with some recent thinking of other scholars on the use of learning technologies and teacher education. About 8 years ago in 2002, Diana Laurillard, a British educator, published a book entitled *Rethinking university teaching: a framework for the effective use of learning technologies*. Laurillard's publication has influenced the domain of thinking in terms of how learning technologies are used and her ideas remain relevant until now.

We would like to quote from Laurillard's rethinking of university teaching, to give us flavour on some of the recent thoughts on educational technology.

“... Learning technologies entail a departure from traditional the traditional modes of teaching at university level, which have always provided adequate opportunities for the teacher-student discussion that has been identified as so important for learning at this level. To improve continually, the development of new technology must have the cyclical character of any learning process. To be successful, the implementation must address the full context of teaching-learning process. To be effective, the design must address all the activities

essential for learning. To be applicable to higher education the design process must acknowledge the special nature of academic learning. ...(Laurillard, 2002, p. 240)

Laurillard's ideas centre around the use of technologies to support learning with appropriate design process and continual improvement of the learning process.

Then, we would like to refer to the work of Ovens (2000) as starting points of departure in discussing the issues on teacher development in this paper.

“... Reflective teacher development would be the main basis for changes such as curriculum development, for a significant component of educational research, as opposed to research on education, and also for the processes of teacher appraisal and the evaluation of educational quality. All of these activities relate to the pivotal role of the teacher as a reflective professional person who has the virtues and qualities illustrated here to transcend the complexity of classroom life in inquiry for professional development. (Ovens, 2000, p. 219)

Ovens' ideas are relevant when we come to talk about development of teachers as reflective practitioners, and it is our institutional duties to develop professional teachers who will teach future leaders of our societies.

Both quotes from Laurillard (2002) and Ovens (2000) are expected to provide insights how we use educational technology in the training and development of teachers. Many of the ideas are relevant, some of those have been implemented, others need to be refined and fine-tuned. It is within these frames of thinking that we would like to address the issue on using educational technology in teacher development in distance education.

Use of educational technology in open and distance learning. The definition of educational technology has evolved. New views of educational technology or learning technology, both terms are generally used interchangeably, have led to the definition of educational technology as the study and ethical practice of learning, facilitating, and improving performance by creating, using, and managing appropriate technological processes and resources (AECT, 2004). The meaning of educational technology, the term that will be used in this paper, includes some of the following characteristics.

1. Educational technology can be said as a separate field of study.
2. The purpose of education is to assist an educational process to achieve expected learning outcome.
3. The educational method and strategy in assisting the education process is through integrated, systemic, comprehensive, and not segmented approaches.
4. Activities that belong into the realm of educational technology are to include all human activities related to efforts throughout the attainment of educational objectives.
5. The term technology contained therein includes a broad spectrum, including hardware such as physical infrastructure and software technologies.

From the above characteristics of educational technology, it can be stated that all strategies are planned, implemented and evaluated in order to support the educational process to go well, then that is the scope of educational technology. Systematic learning design, learning techniques and media used in the classroom learning

process, evaluation process of student learning used by teachers in the classroom can be said as educational technology in classroom practice.

In educational technology, there are three fundamental principles for use as reference in its development, namely systems approach, student-orientation, and utilization of learning resources (Sadiman, 1984; Suparman, et al, 1999). In general, the applications of educational technology are expected to be able to:

1. Disseminate information widely, simultaneously and fast.
2. Assist, complement, and to some extent replace teachers' roles.
3. Be used to conduct instructional activities both directly and as a by-product.
4. Support community learning activities and invite community participation.
5. Add to diversity of resources and learning opportunities.
6. Add interests in learning.
7. Help change attitudes of users.
8. Affect the views of users towards materials and processes.
9. Have the advantage of cost-effectiveness ratio, compared to the traditional system (Miarso, 1981).

Using educational technology in distance education. The focus of educational technology is on human learning. Learning itself can be interpreted as a change in a person, or in an institution, which is relatively settled and continues growing in knowledge, attitudes and skills, thanks to consistent thoughts and experiences. Learning happens anywhere, anytime, anyhow, from any kind of thing or person, and in many ways.

There are at least five concepts in educational technology that have been integrated into the educational system, and they are stated in the 2003 Act on National Education System and its relevant Laws and regulations. These five concepts include: (1) learner-focused instruction, (2) use of a variety of learning resources, (3) bottom-up approaches in managing learning activities and their implications on the educational unit, (4) an open educational system with multiple-meanings, and (5) distance education (Miarso, 2004).

Universitas Terbuka (UT) consistently applies open and distance education system as one forms of implementation of educational technology concept to overcome barriers to educational access, equity and participation. As described by Suparman et al (1999), activities performed by UT are some examples of good practices and implementation of educational technology principles in Indonesian higher education. UT can be said to be the product of applying the concept of educational technology in implementing good practice in open and distance education, meaning that at UT there can be the absence of entry and selection system, use of a variety of learning resources, and a systematic design of instruction for distance learning.

In-service primary teacher education

Teacher education. The education sector needs professional teachers who must have high competence in planning, implementing and evaluating teaching-learning activities. In order to meet such competency requirement, the educational institution that prepares teachers will have to design appropriate training and professional development programs for teachers. The teacher education institution has to be

properly equipped with prerequisite conditions such as buildings, curriculum, material and effective teacher education system. Indonesia is a country that consists of islands and has the distance edges more than those of the United States. The country also has many distinct domestic tribes that have different local languages, dialects, cultures, values and traditions. The educational system should think over about those differences and diversities as both potential opportunities and challenges.

The curriculum for teacher education will also have to relate and accommodate the society beliefs, including the local habits, traditions, and intellectual heritage. The entire education system will fail whenever it does not facilitate and motivate learners to develop and improve the distinctive local life and cultural system. More or less any local intellectual heritage will indicate the local colour and flavour of the society that will be colouring their aptitudes and thinking perspectives about the future through the education system. Based on the curriculum that has been synchronized into any points of the society views and beliefs, there will be constructed the understandable materials that can be easily derived from the local knowledge.

In teacher education, basic competencies that should be owned by professional teachers are trained to the student teachers. Based on the Act Number 14 Year 2005 on Teachers and Lecturers, it is written that every teacher should have four basic competencies, namely pedagogical, personality, professional, and social competencies. Teachers as learning agents should have pedagogical competence, meaning that they have the ability to manage the teaching and learning process in the classroom. While personality competence means that teachers should have strong personal ability, noble manners that are wise, authoritative, and serve as a role model for students. Professional competence means teachers have to have strong, deep, and broad knowledge in their own areas. Teachers as facilitators and motivators should be able to communicate and interact with their peers, students, students' parents and the community effectively and efficiently. These features describe that teachers have social competence. If every teacher is provided with these four basic competencies, the national education goals can probably be achieved successfully.

Primary teachers. Primary teachers, who teach in primary school from first grade to sixth grade, also have to have the four basic teacher competencies. As primary teachers they have to teach almost all subjects except for Religion, Physical Education, and Arts. A primary teacher usually teaches all subjects in one classroom, and she or he is responsible for all activities in the class. Therefore, primary teachers should be equipped with those strong basic competencies because they are not only being teachers, but also serve as managers of the classrooms. They are responsible for ensuring that the class runs well and that students learn effectively.

Legal foundation for teacher education in Indonesia. Since teachers play critical and strategic roles in educational process, the government of Indonesia attempts to improve the teachers' qualifications. In Act Number 14 Year 2005 on Teachers and Lecturers, it is written that teachers should have a minimum academic qualification of *Sarjana* Degree or Diploma IV. Therefore, all teachers in Indonesia, including primary teachers, are required to improve their education to meet the qualification as required by the 2005 Act. The Government points the target that by the end of 2015, all teachers have already attained their *Sarjana* Degrees or Diplomas IV.

Moreover, in 2008, the Government released a new decree about teacher that is called *Peraturan Pemerintah Nomor 74 Tahun 2008 tentang Guru [Government Regulation Number 74 Year 2008 on Teachers]*. In the Decree, it is written that every teacher should have teaching certificate after they get *Sarjana* Degrees or Diplomas IV. The teaching certificate is to be acquired through a professional development program conducted by the designated higher education institutions with accredited teacher education programs. Based on this Decree, the Minister of National Education issues Regulation Number 8 Year 2009 on Pre-Service Professional Teacher Education Program, in which all teachers must have Bachelor degrees or Diploma IV certificates and teacher certificates.

Many teachers are still under the qualifications as written in the Act 2005. Some teachers still have Diploma III or Diploma II. Some others have Diploma I, and even some few have High School Diploma only. These teachers have to improve their qualifications. However, they cannot leave their classrooms, otherwise, their students are left unsupervised. Therefore, an education system that is appropriate for their situation is needed. Distance education offers the system that meets the needs of these in-service teachers. It allows teachers to study in order to reach the required qualification while they still can teach their students as usual. Distance education also provides teacher from any level of qualifications to continue their study to upgrade their qualifications to reach the minimum requirements. Furthermore, it provides many kinds of learning to meet teachers' individual learning style. In other words, the distance learning system is suitable to accommodate these teachers.

In-service primary teacher education at Universitas Terbuka

Faculty of Teacher Training and Educational Sciences (FKIP) of Universitas Terbuka. Universitas Terbuka (UT) is a state university established by the government of Indonesia to offer higher education programs exclusively using open and distance learning system. UT is categorised as a mega-university because of its large number of students, currently over 600,000 students. UT has four Faculties, namely (1) Faculty of Mathematics and Natural Sciences (FMIPA), (2) Faculty of Economics (FEKON), (3) Faculty of Social and Political Sciences (FISIP), and (4) Faculty of Teacher Training and Educational Sciences (FKIP). UT also has a Graduate School which currently offers three master programs in Public Administration, Management, and Fishery Management. Other master programs and doctoral programs are under construction and will be offered in about less than 3 years' time.

To date, FKIP currently has over 470,000 students. The primary client of FKIP is in-service teachers, both civil servants and non-civil servants, in accordance with Minister of National Education Decree Number 8/2008). FKIP has four academic departments, namely (1) Department of Mathematics and Science education, (2) Department of Language and Art Education, (3) Department of Social Studies Education, and (4) Department of Basic Education. The Department of Basic Education has three Study Programs, namely (1) Primary School Teacher Education Program (*Pendidikan Guru Sekolah Dasar* or *PGSD*), (2) Teacher Education for Early Childhood Education Program (*Pendidikan Guru Pendidikan Anak Usia Dini* or *PGPAUD*), and (3) Sports Education for Classroom Teachers (*Pendidikan Olah Raga untuk Guru Kelas* or *PENDOR*).

The S1 PGSD Program is the largest Study Program in the Faculty and the University in terms of the number students a program, with over 450,000 students. This Program is intended for primary school teachers, with civil service as well as non-civil service status. This Study Program enrolls students with high school as well as Diploma II certificates. Students with high school backgrounds are required to complete the Program in 10 semesters, while students with Diploma II PGSD have to take the Program in 5 semesters. Since the year 2010.2, the S1 PGSD Program accommodates students with backgrounds in Diploma II Kindergarten Teacher Education Program (*Pendidikan Guru Taman Kanak-Kanak* or *PGTK*) and Diploma II Physical Education Program (*Pendidikan Guru Olah Raga* or *PENDOR*).

The UT S1 PGSD Program is one of the first seven teacher education institutions designated by the government to offer the Primary Teacher Education Program. The S1 PGSD curriculum has been developed in accordance with the national curriculum designed by the government. Students are expected to develop competencies in 3 areas, namely core competencies, supporting competencies, and other competencies. These competencies set out in subjects which offered the program. All of these competencies are addressed in the courses offered in this Program.

In addition to offering core courses in accordance with the requirements for the competence of primary school teachers, the UT S1 PGSD Program offers courses that can support the achievement of teacher certification program, such as through the course Classroom Action Research (*Penelitian Tindakan Kelas* or *PTK*), Technique for Writing Scientific Paper (*Teknik Penulisan Karya Ilmiah*), and Professional Capacity Strengthening (*Pemantapan Kemampuan Profesional*). In these three courses students are trained and provided with insights in conducting research and classroom action research, writing research reports, and improving teaching competence. The S1 PGSD also offers contextual and relevant materials in accordance with the global issues on human rights, innovation in learning, and environmental education. In addition, the S1 PGSD offers courses that support the government program to eradicate illiteracy through the course Community Education and Community-Based Instruction (*Pendidikan Kemasyarakatan dan Pembelajaran Berwawasan Kemasyarakatan*).

Teaching and learning/Instructional strategy. Distance learning strategies require students to develop independent learning capacity. The S1 PGSD Program is designed to develop student self-learning capacity with the provision of quality self-instructional materials. Printed learning materials, popularly known by students as the “module”, function as major learning resource materials for students. The learning materials have been developed following systematic instructional design principles in such a way that they meet requirements for self-instructional and self-contained learning materials. The UT printed learning materials serve as a major role as the “teacher” function in student learning process, replacing the “traditional” teacher role in the face-to-face mode of education. The UT learning materials consist of both printed and non-printed materials.

Learning support. In addition to emphasis on the development of independent learning ability, the S1 PGSD Program provides face-to-face and online tutorial services for students. Each semester, the Program provides the face-to-face tutorials

for three to four courses, selected on the basis of difficulty level and practice/practicum requirements. Overall, the PGSD Program provides face-to-face tutorials for 21 courses; and students can also request face-to-face tutorial services for other than these designated 21 courses. The face-to-face tutorial services have to meet certain criteria for quality assurance, such as the number of students in each tutorial class must be 30 students or less. In addition to the face-to-face tutorials, the S1 PGSD Program also provides online tutorial services to support student learning. So far, there are 19 courses supported with online tutorial services, from which distance students can take advantage to support their learning effort.

Assessment of student learning. Courses in the S1 PGSD Program are evaluated using the paper and pencil test for general courses, performance assessment for courses with practice/practicum requirements. Since 2010.2, the S1 PGSD Program will also provide online examination services in addition to the paper and pencil examination system currently being implemented. This online examination services are intended to solve the problem of conflicting examination schedules for students repeating examination for certain courses and a planned absence from the designated paper and pencil examination schedule.

Applying educational technology in in-service primary teacher education. The application of educational technology in the S1 PGSD Program can be seen in the overall design of the program, including in the use of printed materials. The design of the learning materials allows for interactivity and interaction between students and the lecturers who write the learning materials. Additionally, the application of educational technology in the PGSD Program can also be seen in the design of the non-printed materials, such as web supplements, interactive video, audio and radio programs.

Provision of learning support services and the handling of student grievances and complaints are managed through the customer relationship management (CRM) in online forms is also another example of application of educational technology in the S1 PGSD. In recent years, the S1 PGSD Program has been developing dry laboratory (dry lab) through computer-based simulation for the course Practicum for Primary School (*Praktikum Sekolah Dasar*). This dry lab simulates instructional cases and sharing of experiences among primary school teachers through the online *Guru Pintar* portal.

Use of educational technology for in-service primary teacher education at Universitas Terbuka

Referring to the scope of educational technology earlier discussed, there are three main aspects of educational technology, namely learning resources, systems approach, and **independent learning**. All of these aspects are carefully considered and serve as the basis for the development of the In-service Primary Teacher Education Program (*Pendidikan Guru Sekolah Dasar* or *PGSD*) and other academic programs in all of UT's Faculties and Graduate Programs.

Learning resources aspects of educational technology in S1 PGSD Program. The term "learning resource" is an expanded term of the educational technology field that originally refers to sets of audiovisual equipments. In its development, the term learning resource has evolved more broadly to include all learning materials that are

already provided and well designed to meet students' learning needs. Just as in other courses at UT, in the S1 PGSD Program, the printed and non-printed learning materials serve as major learning resources for distance students' independent and autonomous learning. The concepts and principles of educational technology are consistently and systematically applied in developing learning materials for distance students

One of the scopes of educational technology applied in the development of learning materials in the Program is S1 PGSD is Instructional Design. In a micro sense, instructional design applied to develop learning materials for S1 PGSD begins with development and review of instructional analysis and course outline (*Garis Besar Program Pembelajaran* or *GBPP*). This first step is then followed by the writing and reviewing of instructional materials, and lastly there is the process of editing and finalization of the learning materials. Instructional design is a systemic process that is performed to obtain a product of instructional materials that can be used by distance students' independent learning activities.

Systems approach aspects of educational technology in S1 PGSD Program. Systems approach can be defined as the process of problem solving that applies systems view as a means of problem solving, including solving problems in learning and instruction. The results from applying a system approach in the learning context are an instructional system (Suparman, 2004). In developing the S1 PGSD Program, the learning patterns refer to planned learning objectives that are clearly stated with measurable target achievements.

Learning activities in the S1 PGSD Program is based on a system design. The S1 PGSD applies a system approach right from the start in developing the curriculum to the end in evaluating the program. The system approach that is applied in S1 PGSD can be described in the steps of identification, development, evaluation, and revision of the program. For example, in providing learning support services to S1 PGSD students in the form of face-to-face tutorials, the activities begin with preparation phase such as selection, appointment and training of tutors in accordance with certain criteria and requirements. This is then followed by other series of activities including development of schedule, selection of location, and the design phase of the tutorial activities and the development of materials by tutor. Then there are monitoring and evaluation activities throughout the process and at the end of the tutorial activities, so that eventually all of these components can be used to improve the quality of the face-to-face tutorials.

Independent learning aspects of educational technology in S1 PGSD Program. As has been previously stated, UT employs the principle of open and distance education in which one feature is the freedom and autonomy in choosing learning activities. In this sense, students are not to be framed into a classroom with fixed schedules to follow. Therefore, the independent learning aspect is prominent, because students are required to develop independent learning capacity and be able to learn independently from the provided learning materials, printed as well as non-printed. In the S1 PGSD Program, learning support in the form of face-to-face tutorials are provided to students, and yet the independent learning aspect remains essential, in which students are required to learn independently from the provided learning resources, i.e., the modularised self-instructional materials.

The S1 PGSD has been established on the basis of the three fundamental aspects of educational technology. Furthermore, the S1 PGSD Program has adopted the concept of educational technology in terms of the utilization of information and communication technology as media for learning. With the introduction of online tutorial services for some courses in the S1 PGSD Program, students are encouraged to utilize and apply the product of educational technology to solve their learning problems. The use of online tutorials that require students to be in touch directly with new technology, i.e., the Internet, is a good practice example in the application of educational technology in the S1 PGSD Program.

The benefit of the applications of educational technology in the S1 PGSD Program is to develop sensitivity and capability of the students to anticipate and respond to challenges in education in a good degree of optimism. However, there may also be some potential constraints in the applications of educational technology in the S1 PGSD Program when students are not well prepared for the change to adopt and use technology wisely and effectively to benefit their learning effort.

Students in the S1 PGSD Program are primary school teachers studying at a distance while continuing to work as classroom teachers in primary schools located throughout Indonesia, including those in remote, rural, and deprived areas of the country. This type of students has to cope with challenges in terms of managing and allocating time for learning, and for many of those working in primary schools in remote areas, there are further challenges relating to local circumstances, natural conditions, and inadequate infrastructures, such as electricity and internet connections. For those students, who have already been aware of the distance learning system, they are expected to be able to respond to such challenges in positive and optimistic attitudes. However, for those students who are not aware of the challenges in distance learning in S1 PGSD Program, they will see these challenges as obstacles to their learning process.

Considering the diverse characters of the S1 PGSD students, UT provides the face-to-face tutorial services for students. Moreover, as part of enrichment of learning materials, the PGSD Program develops specific portal accessible by students of S1 PGSD Program and by primary school teachers in general, so that they have easier access to broader and richer learning resources. With the use of internet, the S1 PGSD Program has attempted to widen its reach to primary school student teachers located in many different and remote corners of the country.

How in-service primary teachers benefit from the use of educational technology.

The scope of educational technology includes the use of audiovisual learning resources and the use of computer and internet technology. Since the beginning of the development of the S1 PGSD Program, UT has made the preparation to use technology to enhance the competence of the primary school student teachers. One of the courses offered to this group of students is “Computer and Media for Learning”, which aims to develop S1 PGSD students to have the skills and competencies to understand and utilize computers as tools for learning.

By mastering the course “Computers and Media for Learning”, students are expected to develop the skills and competencies to use computers to explore various learning resources independently and transfer their knowledge and skills to students in their

primary school classrooms. Moreover, students are expected to be able to develop innovative media for learning that can be used in their daily classroom teachings in primary schools. In addition, with the provision of online tutorial services in 21 courses of the S1 PGSD Program to substitute the absence of the face-to-face tutorial services for these 21 courses, students are further expected to enhance their skills and competencies both in terms of mastery of the learning materials and use of internet technology. The UT learning support system for the S1 PGSD Program has been designed in such a way that it can be used effectively the students to foster a sense of confidence, motivation and enhanced self-concept among primary school teacher students.

Operational support for in-service primary teacher education at Universitas Terbuka

As an ODL system, teaching and learning at UT relies on the students' autonomy and independence, supported by media and other learning support services designed to meet the specific needs of distance students. The teaching and learning system has been designed in such a way that it accommodates the diverse needs of students in various regions with different conditions and circumstances. Primary teacher students get the learning materials and kits, study on their own or in groups, attend face-to-face tutorials, and conduct practicum and practice supervised by appointed instructors.

Learning support for primary teacher students is provided in the form of tutorials (face-to-face and online), and practice and practicum supervision. Students are required to attend the face-to-face tutorials for eight sessions, in which they are requested to submit their assignments during the 3rd, 5th, and 7th sessions respectively. Primary teacher students are encouraged to establish study groups, in which they can interact, communicate and learn with peer teacher students. Peer study groups are developed by the students' own initiatives among themselves who live in the same areas in order to facilitate discussion group meetings.

During the course of their studies, students' learning processes are assessed in various ways. Students' learning progress is assessed based on their submitted assignments, participation in discussions during face-to-face as well as online tutorials. Similar to UT students in other programs, primary teacher education students are required to take different kinds of examination.

Managing a distance education system requires careful planning and control, and to a large extent it involves the applications of industrial management principles in its large scale supporting operations. An effective distance education system should be able to serve a large number of students and reach the most remote and rural locations as well as the disadvantaged groups of the societies. The logistic support for a distance education system includes development and production of learning materials, distribution of learning materials, administration of examination, information services, and other academic as well as administrative services.

To ensure effective logistic and operational support for a large distance education system, since 2004 UT has established a dedicated Institute of Learning Materials Development, Examination and Information System (*Lembaga Pengembangan Bahan Ajar, Ujian dan Sistem Informasi* or *LPBAUSI*). The Institute serves as an academic

support unit with specific responsibilities to coordinate and manage the development and production of learning materials, distribution of learning materials, administration of examination, and management of information system. The Institute manages and coordinates 4 operational Centres within its responsibilities, namely: (1) Multimedia Learning Development Centre, (2) Learning Materials Service Centre, (3) Examination Centre, and (4) Computer Centre.

Development and production of multimedia learning materials. The development and production of multimedia learning materials is one specific feature of a distance education institution. At UT, learning materials are authored by senior professors and academic from established campus-based universities, coordinated by the respective Faculty. These learning materials are then processed into self-contained learning materials ready for use by students for independent learning. The multimedia learning materials comprise printed and non-printed materials that are used by students independently, systematically and autonomously in accordance with their learning pace and interests. The design and development of learning materials for distance students require specific expertise and professional competence. Production of master copies is conducted in the Multimedia Development Centre, while re-production of the printed materials are outsourced to the printing companies outside the University through a bidding procedure following government guidelines. Accurate prediction for reproduction of the learning materials are based on data on course enrolment trends and students' purchases of the learning materials through the UT's online bookstore.

Distribution of learning materials. The distribution of learning materials resemble the industrial distribution system, in which the learning materials are received in the Learning Materials Service Centre warehouse, recorded electronically, stacked systematically, pre-packed and then delivered to Regional Offices, study groups, and individual students following certain procedures. Most of the delivery of the materials are outsourced to service providers for efficiency. Managing stock effectively and delivering the learning materials to students accurately, timely and efficiently are the core business of the Learning Materials Service Centre.

Administration of examination. Examination serves a critical role in the learning process in order to assess students' learning. Examination papers are developed by the Faculty, and the Examination Centre is responsible for administering examination securely and effectively in locations throughout the country. Regional Offices are responsible for conducting examinations in designated sites and locations. The Examination Centre has a computerised item banking system to prepare examination papers for courses. The electronically assembled examination papers are then printed in the Centres' printing shop, pre-packed and then delivered to Regional Offices in sets of 20 examination papers per examination room. The results of the examination are returned to the Centre for processing to produce individual grades for courses registered by students. Online examination system has been offered and it has become more attractive options to many of UT distance students for some reasons.

Information technology services. As a large and complex distance education system, UT has relied on effective use of information and communication technology (ICT) to support its management system as well as teaching and learning services. The UT has implemented a variety of online services for teaching and learning, counselling,

information dissemination, and other services. As access to ICT is getting easier, many UT students have used online services regularly to assist them in learning and getting other services. In the future, UT will rely more and more on the use of newer technologies to support learning and management.

Conclusion

There is no doubt that educational technology has enhanced students' learning in open and distance education system. Any open and distance education system relies on the application of educational technology in order to operate well. For UT, there has been increasing uses of new technologies because of easier access, decreasing costs, and improved information and communication technology (ICT) infrastructures in Indonesia. Moreover, the Government supports UT and other higher education institutions implementing distance, online and blended learning by making optimal use of educational technology in the learning process, management, and access to information (Depdiknas, 2005).

In-service teachers have benefited from the upgrading of their qualifications and the exposure to educational innovation in the use of new technology throughout their distance learning process. It is expected that students teachers can then adopt and adapt innovations in the use of technology in their daily classroom teachings. It is the challenge of teacher educators to continuously improve quality, innovate, enrich learning experience and build capacity of teachers using various means of older as well as newer technologies.

Trends in the use of new technologies in distance and blended learning in Asia, and the rest of the world, have been emerging strongly. In a recent publication, Latchem & Jung (2010) have addressed the use of new technologies in Asian distance and blended learning and the significance of the necessary prerequisite in terms of e-readiness, e-learning readiness, e-innovation, and e-transformation. They further remind us about the use of older as well as new technologies.

“... It is important to consider the older as well as the newer technologies and methodologies, to avoid techno-determinism and to train teachers and trainers in how to apply technology in education, training and community development and not simply how to operate the hardware. It is important to consider the culture, needs and circumstances of the learners rather than being reliant on Western theory, research and practice. ...” (Latchem & Jung, 2010, p. 21)

To ensure credibility and reputation, any open and distance learning system must be built upon solid foundation of quality assurance system in which quality improvement is continuously taking place and the needs of learners and stakeholders can be satisfactorily met. We all look forward to seeing more effective integration of technology into education, particularly teacher education at a distance.

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