

Educational Communications and Technology:
Issues and Innovations

Ian A. Lubin *Editor*

ICT-Supported Innovations in Small Countries and Developing Regions

Perspectives and Recommendations for
International Education



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Chapter 6

Implementing Sustainable ICT-Supported Innovation Policies: Case of Universitas Terbuka – Indonesia

Dewi A. Padmo and Tian Belawati

Abstract As a distance learning university, the use of ICT at Universitas Terbuka (UT) is of central importance for both administration and instruction. As technology continues to advance and change very rapidly, the university is pressured to enhance the utilization of ICT even more. It is believed that the use of an ICT-supported distance learning environment can and will increase the quality of student learning as well as enhance the efficiency of the administration. Yet, two important considerations are the nascent national ICT infrastructure and the lack of readiness of students to embrace ICT-supported learning environments. Given the challenging and limited national ICT infrastructure, the challenge for management is how to keep innovating and introducing state-of-the-art ICT-supported learning to facilitate the enhancement of student readiness and their familiarity with online learning. Similarly, strong leadership is needed to convince the entire university faculty and staff to support the university's policies on the development and implementation of ICT-supported innovations. This chapter will describe the experience of Universitas Terbuka (The Indonesia Open University) in addressing concerns about the sustainability of their ICT-Supported Learning System and administration, including discussions about policy-making, action plans, implementation, student participation, student and staff ownership, as well as maintenance.

Keywords Policies in implementing ICT • Sustainable ICT • Open universities • ICT learning systems and administration

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1 Background

Indonesia is the largest archipelago country in the world with over 17,000 islands located in the South-East Asia region. In terms of population, Indonesia is the fourth largest nation in the world with a population of over 255 million people (CIA Factbook, 2016). Amid abundant natural resources, Indonesia's human development index is still classified as medium and ranks at 110 in the 2014 Human Development Index, with Gross National Income per capita of US\$ 9787 (UNDP, 2015; World Bank, 2016). Nevertheless, the McKinsey Global Institute (2016) predict that Indonesia can become the 7th largest economy in the world by 2030 if it can increase its base of skilled workers from about 55 to 135 million. This is based on the fact that Indonesia's dependency ratio – a measure of the percentage of the population too young or too old to work – is about 40. This means that Indonesia is currently enjoying the demographic benefit of a higher productive-age group within the population. However, if Indonesia fails to upgrade the competency and capacity of its people, this demographic bonus will not benefit the country, but instead can become a burden to the economy. Therefore, education has become the top priority for the government, such that in a 2002 amendment to the constitution, the government allocated 20% of the national budget to the educational sector (Republic of Indonesia, 2003).

Indonesia's formal education system consists of four levels. There are the primary, junior secondary, and senior secondary levels with participation rates of about 96%, 74%, and 54% respectively. Then there is the tertiary level which, despite a large number of higher education institutions in Indonesia (about 4200), has a much lower participation rate – at about 32% (UNDP, 2015). This low participation rate is due to several barriers, including the geographical situation, as well as the unequal spread of higher education institutions within the 37 provinces in the country (see Fig. 6.1). As seen in the map, Indonesia is an archipelago, which consists of six big islands (Sumatera, Java, Kalimantan, Sulawesi, Nusa Tenggara, Maluku, and Papua) and thousands of small and remote islands that are underdeveloped in terms of infrastructure. Most higher education institutions can be found on the islands of Java and Sumatera, which are located in the southwest part of the country. The uneven distribution of educational infrastructure, of course, is far from ideal and is jeopardizing the realization of Indonesia becoming a large-economy country.

The advancement of information and communication technologies (ICT) opens up many possibilities for both broadening access to and increasing quality of education (Kozma & Vota, 2014). Today, it is not only that education can be provided online, but also that there are many educational resources available on the Internet. The global movement on openness has resulted in the development of ample open source software, open content, and even open courses that can be beneficial for the development of human capital (Belawati, 2014). It is now possible for any country to enrich its provision of education by taking advantage of what is available in the digital world. Yet, for developing countries, there are numerous impediments to obtaining what value there is in open education through ICT (Hinostroza & Labbé, 2011).

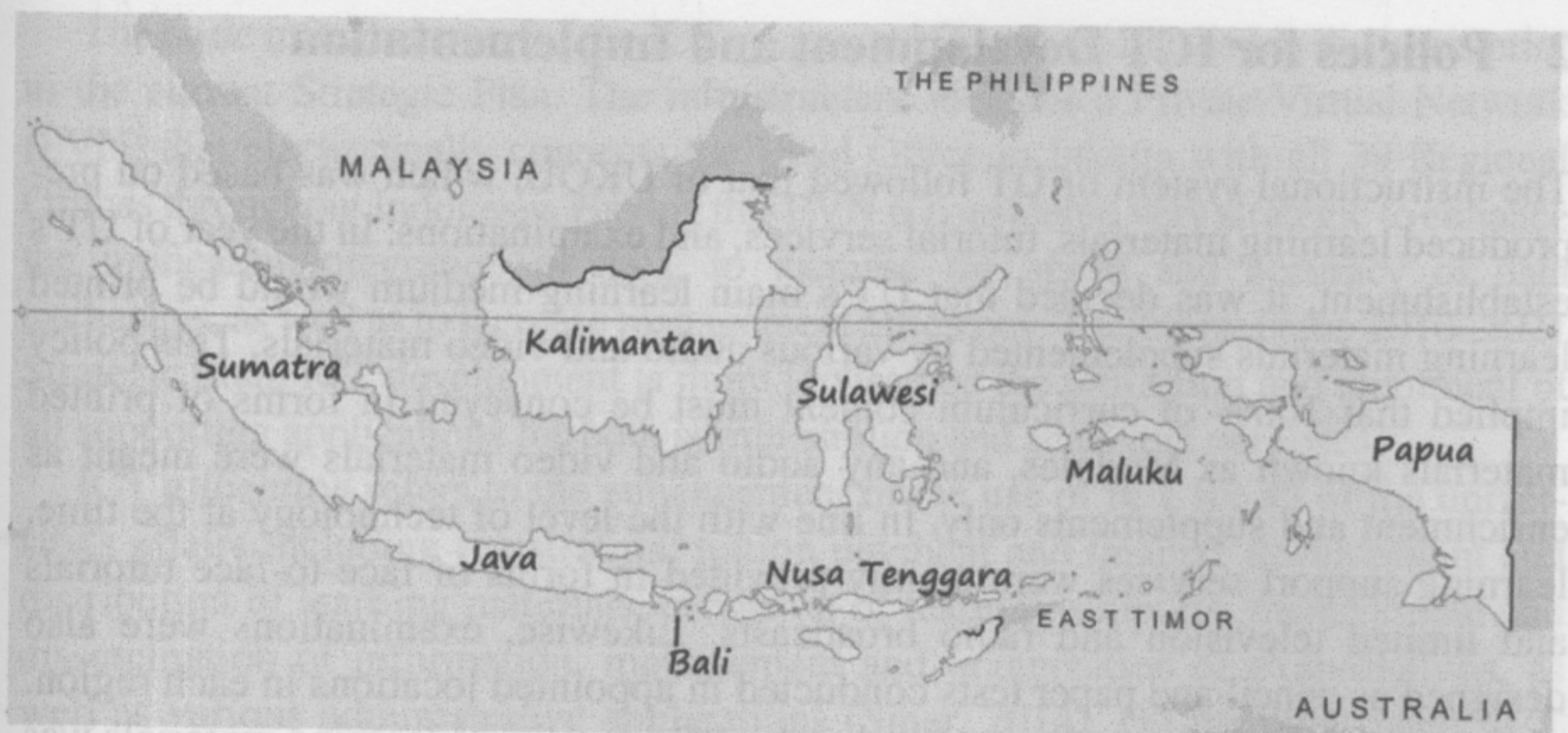


Fig. 6.1 Map of Indonesia (Source: Indahnesia.com, 2017)

For example, as data shows, most of the available open content is in languages foreign to Indonesia, such as English, Spanish, Chinese, French, etc. (Daryono & Belawati, 2013). Another requirement for realizing the benefits of open educational content is the availability of Internet access (Daryono & Belawati, 2013).

For Indonesia, content in local languages and access to the Internet remain issues that need to be addressed. Although English is taught in school from Grade 3 of primary education level, most Indonesians are not fluent in either speaking or reading English. Most Indonesian people speak at least two languages, including their local language and the national language of Bahasa Indonesia. Additionally, with regards to Internet access, although Indonesia ranks number four in Asia, the penetration rate is still only around 34%, which is much lower than Malaysia (68%), and Singapore (81%) (Internet Worldstats, 2016).

The Government of Indonesia (GoI) has responded by trying to increase access to higher education. Understanding the wide geographical context of the country, the GoI realized that it was not possible to build enough campuses to equitably satisfy the population demand. The government's Ministry Education and Culture, following the United Kingdom Open University (UKOU) model, decided in 1984 to establish an open university, which later was named the Indonesian Open University - better known as Universitas Terbuka (UT). The main purpose of UT's establishment was to increase the capacity of the higher education system in providing access to all citizens. Therefore, UT was designed to deliver quality distance learning programs using the most appropriate technology, so that the university would be able to tap students' unreached potential. Those are the people who, due to various constraints including lack of funding, living in isolated rural areas, and lack of time are not able to continue their studies at university level. Thus, the reasons for the establishment of UT were both educational as well as political in nature. UT represents the presence of the government in providing access to education to all citizens, as mandated by the 1945 Indonesian Constitution (Republic of Indonesia, 2016).

2 Policies for ICT Development and Implementation

The instructional system of UT followed that of UKOU, which was based on pre-produced learning materials, tutorial services, and examinations. In the year of UT's establishment, it was decided that UT's main learning medium would be printed learning materials supplemented by various audio and video materials. This policy implied that 100% of curriculum content must be conveyed in forms of printed materials known as Modules, and any audio and video materials were meant as enrichment and supplements only. In line with the level of technology at the time, learning support services were mainly provided in forms of face-to-face tutorials and limited television and radio broadcasts. Likewise, examinations were also designed as pencil and paper tests conducted in appointed locations in each region. The decision to provide self-contained and self-instructional learning materials was taken considering that many potential students might not have any access to other media other than the printed books.

Nevertheless, as a distance learning university with a large number of students, UT has always relied on technology to support its data management and administration. In the beginning, UT's computing system was developed chiefly for administrative purposes, one of which is the main application for the Student Record System (SRS). The SRS stores and manages data on curriculum, student registrations, as well as examinations and grades (Belawati, Hardhono, Sinar, & Patria, 2009). It is this SRS that later became the backbone of the entire university computing system. Since the introduction of the Internet in Indonesia in the mid-1990s, UT immediately developed the university website which later became the basis for the current comprehensive UT Online Learning System.

To ensure sustainability, policies on any development, including the development of various ICT applications, are comprehensively stated in the university's strategic and operational plans. Therefore, the commitment to become a more modern open university by optimizing the use of ICT is also formulated in UT's strategic plan. The current 2010–2021 Strategic Plan (Universitas Terbuka, 2011a) emphasizes the importance and need to improve the quality of administration and instruction through the use of appropriate ICT. The Strategic Plan, which is further elaborated in the 2010–2013 and the 2014–2017 Operational Plans, lays out the annual stages of development and targets to be achieved. Each target is well defined in measurable output indicators and the relevant Vice Rector (Vice President), through respective working units within the university, monitors the progress. Although it is led by the Computer Center, the responsibilities of each stage of ICT development are shared and involve many people and units working to increase the sense of ownership of the output among people and units. This is very important to ensure the seamless process of implementing the ICT applications once they are deployed. To ensure the sustainability of implementations, all policies are well disseminated and actions are all consistently taken through a comprehensive process of development, training, implementation, maintenance, and evaluation based on the outlined targets and indicators of achievements.

The basic infrastructure for the ICT system at UT was established in the years prior to the current Strategic Plan. The infrastructure includes a Private Virtual Network (PVN) that electronically connects the Head Office in Jakarta with all 39 Regional Offices throughout Indonesia. Having this PVN is considered very strategic to enhance the unification/integration of data, to increase the speed and accuracy of data exchanges, as well as to increase management efficiency. Therefore, in the 2010–2021 Strategic Plan, ICT development is more focused on the utilization and alignment of all supporting applications for both administration and academic purposes.

ICT *utilization* refers to the enhancement of the use of ICT for all of the university's affairs including registration, tuition payment and finance, development and distribution of learning materials, provision of learning supports, management and dissemination of information, management and organization of examinations, as well as various administrative applications (Sinar, 2014). On the other hand, ICT *alignment* refers to harmonization of all ICT applications to support all activities comprehensively to all users (Sinar, 2014). In 2008, to assist the planning of the enhancement of ICT utilization, UT developed an ICT grand design, which later was integrated into the university's Strategic Plan for 2010–2021. This grand design was updated in 2013. In general, the ICT development in the 2010–2021 Strategic Plan can be categorized into two main streams, which are administration/operational and academic/instructional affairs.

3 ICT-Supported Administration System

As an open university catering to a large number of students, UT has always relied on technology to support its administration affairs. As mentioned previously, the first computer application that was developed and heavily used by UT was the Student Record System (SRS), which has become the backbone of the whole university computing system. A further step in the development of the ICT-supported administration system was the establishment of a Private Virtual Network (PVN) that electronically connected all UT offices (Patria, 2014). All other development to support administrative works is well outlined in UT's Strategic Plan 2010–2021, which is further elaborated in the Operational Plan of 2010–2013 and the Operational Plan of 2014–2017 (Universitas Terbuka, 2014a).

3.1 Policy and Action Plans on ICT-Supported Administration System

The Strategic Plan of 2010–2021 has set several targets to be achieved with regard to the ICT-supported administration system. The priorities of ICT development in the Operational Plans of 2010–2013 and 2014–2017 for administration and

operational affairs include the improvement of the online registration system that is integrated with the payment system, the establishment of a contact center, and the improvement of human resource management that is integrated with the financial system.

As outlined in the Operational Plans, the specific targets for the above development are as follows. At the end of 2017:

- The online registration system will be well established and used by at least 3% of students
- The ICT-based financial management system will be running efficiently and will be used for budget planning, implementing, and reporting
- The ICT-based asset management system will be running efficiently and will be used at both university and unit levels
- The contact center will be well established, and
- The ICT-based human resource management system that is integrated with the remuneration system will be running efficiently and used for payroll

3.2 *Implementation of the ICT-Supported Administration System*

UT began developing online registration in 2011 and gradually implemented it in 2012 (Milwan, 2014). The system is designed to help enrolled students as well as prospective students to register easily by simply accessing the website, <http://sro.ut.ac.id>. Table 6.1 shows the use of the online registration system in the years 2012–2015 for both new students (first registration) and for students who were already enrolled (course registration). Compared to the total registration (approximately 400,000 students), Table 6.1 shows that the use of online registration is still very low. This low number is understandable since students are not yet familiar with an online registration system. However, increases in the number of students using the online registration system, especially in the Diploma/Bachelor program, indicate that the innovation is appreciated.

The application system for financial management is one of the most crucial ICT developments. The financial management applications that have been developed and used are those for planning, budget execution, and reporting. ICT applications that have been used can be divided into two types: the unit-level for generating the internal financial planning to be integrated at the university level, and the university-level for financial planning that is directly connected with the Ministry of Finance of Indonesia (Damayanti, 2014). Similarly, for the realization of the budget, UT has been using applications that are connected directly to the Ministry of Finance. The use of these applications is helpful for financial management, from planning to reporting. As for asset management, UT has also been using ICT applications both for procurement of goods and services, as well as for recording all

Table 6.1 Online registration use

Semester	Diploma/Bachelor program		Master program	
	First registration	Course registration	First registration	Course registration
2012.1	336	4910	–	–
2012.2	472	5687	–	–
2013.1	67	1849	193	1413
2013.2	456	3960	388	1361
2014.1	117	3789	336	923
2014.2	498	4638	699	997
2015.1	349	5608	153	1388
2015.2	544	6.169	693	1180

Source: Universitas Terbuka (2012, 2013, 2014b, 2015)

university assets. Furthermore, since 2013, procurement of goods and services has also been done using e-procurement applications.

A Contact Center, an ICT innovation for opening up a multi-platform communication channel with students, was launched in 2014. Known as ‘Hallo UT’, the center manages and responds to all queries about UT received either through telephone calls, e-mails, faxes, SMS, or social media (Facebook, Twitter, LinkedIn, and Google plus). Through ‘Hallo UT’, students or the general public can access information about UT, convey any complaints or concerns, and ask questions related to the UT services. In addition, UT’s Contact Center has also become an agent for Digital Marketing.

Regarding the ICT-supported human resource management, UT developed SIMPEG, which is an application for handling personnel administration that can be accessed through the website, <http://simpeg.ut.ac.id>. Through this application, employees’ data are stored for easy retrieval. The system is additionally utilized for processing employee promotion, evaluation of performance and productivity, as well as the payroll. Through this application, appraisal of each employee’s performance is processed automatically to calculate the amount of remuneration for each employee. Thus, the human resource application is well-integrated with the financial applications.

4 ICT-Supported Learning System

With a large number of students to be served, UT cannot provide a timely quality learning system without the use of ICT. In fact, this is stated as university policy in UT’s Strategic Plan as well as in the Operational Plans. The main goals of providing an ICT-supported learning system are to address the need for more accessible learning materials, online learning supports, and examinations. Under these umbrellas, the targets include, but are not restricted to, the following: easy access to UT academic products through UT’s Digital Library, availability of online laboratories in

the forms of dry labs for practical work, availability of online self-tests, increased access to UT's learning supports through the online platform and the short text messages (SMS) platform, as well as access to a reliable online examination system.

4.1 Policy and Action Plans on ICT-Supported Learning System

As mentioned earlier, UT's Strategic Plan Year 2010–2021 is further divided into two action plans, namely the Operational Plan of 2010–2013 and 2014–2017, respectively (Universitas Terbuka, 2011a, 2014a). Both operational plans specifically define the objective and targets of their respective ICT developmental programs and activities.

The specific targets outlined in the Operational Plan of 2010–2013 and 2014–2017 related to the ICT-supported learning system include the following, which are expected by the end of 2017:

- All printed course materials will have been digitized and can be accessed through the Digital Library's Virtual Reading Room
- All practical work courses will be available in forms of dry labs in the university learning portal
- All courses will be provided with online tutorial services
- UT will offer online examinations for all courses in both multiple-choice and essay formats
- UT will offer at least three fully-online post-graduate programs including the use of tablet-based learning materials
- UT will offer massive open online courses (MOOCs) for at least one course per faculty as parts of its community services
- All online learning supports will be accessible through a variety of communication devices, including mobile devices

It is envisaged that at the end of 2017, UT students will have the benefit of choices of learning systems. As a result of the continuous development and improvement of the ICT-supported learning system, students will be able to choose whether they would like to pursue their education at UT through the online platform or the more conventional distance learning platform (i.e. printed based materials with a face-to-face tutorial system). Students will also be able to access various learning supports and resources through both online and offline systems at the Regional Offices. Importantly, maintaining the offline system is very important to ensure the inclusiveness of the UT system to people who do not have access to the Internet. Based on the Internet world statistics, the number of Internet users in Indonesia is about 34% (88 million out of 255 million of the total population). Thus, about 66% of the population does not have access to the Internet (Internet Worldstats, 2016).

4.2 Implementation of ICT-Supported Learning System

The implementation of the ICT-supported learning system, in accordance with the Operational Plans, has been conducted purposively and systematically. As intended, a range of innovative uses of ICT in improving the quality of the learning system is now available for students. All innovations are meant to help students improve their independent learning processes, and therefore the benefit of such innovations is measured through the students’ utilization of the products and services.

At the end of 2014, UT had digitized learning materials for about 985 courses, which are made available to students through the Virtual Reading Room (Universitas Terbuka, 2014b). The existence of the Virtual Reading Room is well appreciated by the students. Data show that in its first year of deployment in 2013, the number of visitors to the Virtual Reading Room reached 152,000, 62.5% of whom were unique visitors or repeat visitors (Wahyono, 2014). This shows that UT’s policy on ICT-supported learning materials distribution (digitized learning materials distributed through the Digital Library) has reached almost 30% of its total students.

The online tutorial provision is at the core of the ICT-supported learning support system at UT. As targeted, at the end of 2013 UT had provided online tutorial services for all courses using the Moodle-based Learning Management System (LMS) (Moodle, 2016). The improvement of the online tutorial services is not only in terms of the number, but also in the quality (Zuhairi, Adnan, & Thaib, 2007). Online tutors are trained and required to enrich their tutorial materials with visualization of concepts, including those taken from open educational resources (OERs) available from various Internet sources. By adding OER materials to the online tutorials, students are likely to be more motivated and interested in their learning, as well as to expand their horizons. The use of OER by academic staff relates to an effort in providing pedagogical supports for learners, such as “exciting learners about new ways of learning, providing learners with current knowledge, and supporting learner

Table 6.2 Total number of online tutorials offered and the number of participants Year 2011–2015

Semester	Number of tutorials offered	Number of tutorials with participants	Total number of participants in courses
2011.1	664	649	23,504
2011.2	660	628	31,578
2012.1	747	698	64,118
2012.2	752	719	105,078
2013.1	930	849	108,942
2013.2	930	843	123,960
2014.1	1021	985	222,905
2014.2	1044	1013	226,479
2015.1	1063	1045	277,397
2015.2	1076	1070	319,235

Source: Universitas Terbuka (2011b, 2012, 2013, 2014b, 2015)

creativity” (Dhanarajan & Abeywardena, 2013, p. 11). To illustrate the impact of policy on online tutorials, Table 6.2 shows the increase in the number of online tutorials and their participants from 2011 to 2015.

As seen in Table 6.2, the number of online tutorial courses offered had increased steadily. Similarly, the number of online tutorials with participants attending and the number of overall enrolled participants has also increased significantly. In the second Semester of 2015, the number of students who participated in online tutorials was 319,235 – an increase of 1,258% within the duration of 4 years. Participants in the second semester of 2015 were participating within the online tutorials of 1070 courses and were divided into around 4000 virtual classrooms, with each virtual classroom attended by 35–112 student participants.

In addition, as part of the online learning support system, UT also developed an online self-test system as an exercise platform for students, especially in preparation for the final examination. Similar to the online tutorials, this service is also well appreciated by the students as shown by the steady increase in utilization as presented in Table 6.3. The table shows the number of online self-tests accessed by students and the total number of students accessing the online self-tests. Moreover, to help students with practical work, all courses needing such work have been supplemented with dry labs that are integrated within the online tutorials. A dry lab is a computer-based simulation of experiments that helps students to become familiar with conceptual, logistical, and numerical aspects of a practical experience before coming to the laboratory (Learmonth, 1996). These efforts demonstrate the consistency of UT policies in optimizing the use of ICT in all aspects of learning services.

The steady increase in the utilization of both online tutorial and online self-test services suggests that the policy on ICT-supported learning system is well valued by the students. Students’ Internet accessibility has improved as well, as reported by Internet Worldstat (2016). The Internet penetration in Indonesia in 2016 was about 34% (88 million out of the total of 250 million population). While still small, it represents an increase of about 1.0% from 2015 (Internet Worldstat, 2016). The increased accessibility to the Internet has also been influenced by mobile device penetration. Data show that mobile phone or smartphone usage in Indonesia is very high, reaching 270 million mobile phone numbers – a penetration rate of over 112% (Gusti, 2014).

Another core element of learning support services is the provision of Digital Library facilities. The Digital Library and its Virtual Reading Room are very instrumental in providing students with easy access to the learning materials. Complimentary to the digitization of learning materials, the Digital Library also supplies students with numerous collections of digital books and journals (Wahyono, 2014). The services through the Digital Library have been well utilized by the students – a total of 636, 585 visitors were recorded during 2014 alone.

An additional milestone for the ICT-supported learning system was the online final examination system. As known, final examinations measure the learning achievement of students. In an effort to provide a better examination service for the students, UT already had an established ICT-based Item Bank System to store its test items for easy retrieval. As students demanded more flexible examination times, in 2004 UT then started to develop a computer-based examination system that was integrated with the

Table 6.3 Total number of online self-test and students accessing online self-test Years 2011–2015

Year by faculty	Total number of online self-tests accessed by students					Total number of students accessing online self-tests				
	Economics	Social sciences	Education	Math & natural sciences	Total	Economics	Social sciences	Education	Math & natural sciences	Total
2011	82	108	316	136	642	19,689	15,456	31,334	8368	74,847
2012	102	109	324	138	673	35,108	25,876	53,616	13,811	128,411
2013	108	101	300	139	648	58,713	41,224	74,195	18,453	192,585
2014	143	117	142	345	747	72,402	32,368	72,871	15,782	193,423
2015	145	129	355	245	874	145,200	55,300	104,300	24,500	329,300

Source: Universitas Terbuka (2011b, 2012, 2013, 2014b, 2015)

Table 6.4 Number of courses and number of participants using the online examination system

Semester	Number of courses with online exam	Number of students/ examinees	Number of students-online exam courses
2011.1	509	966	1811
2011.2	491	1063	2123
2012.1	595	2361	4120
2012.2	592	3248	5641
2013.1	634	3848	6474
2013.2	634	4111	6180
2014.1	662	5152	7526
2014.2	674	5735	8224
2015.1	713	7342	11,444
2015.2	717	7772	12,169

Source: Universitas Terbuka (2011b, 2012, 2013, 2014b, 2015)

existing Item Bank System (Sapriati & Pardede, 2014). The implementation of computer-based examinations started in 2007, and after going through the stages of piloting and revising, in 2008 the system was converted into a fully online examination system using the university’s VPN. Subsequently, students were able to take online examinations in one of the university’s Regional Offices starting in 2009. The online examinations cannot be taken outside the Regional Offices for security reasons. Table 6.4 shows the number of online examination courses and the number of examinees taking the online examinations from 2011 to 2015.

As seen in Table 6.4, the number of students who take the online examination is still low compared to the overall number of students. However, it can be seen that the number of students participating in the exam online has increased from 2011 to 2015. Starting in 2015, to provide more flexibility for students to take the online exam, the exam window has been extended to 4 months, from 2 months. Furthermore, as the current online examination system is designed only for multiple-choice, and as exams must still be taken at the regional offices supervised by the proctor, UT is now developing an online examination system for essay questions. This new feature hopefully will be implemented in the near future. Similarly, UT is currently conducting research on online proctoring, so that in the future, the online examination can also be taken outside the Regional Offices.

With regard to the goal of offering fully online post-graduate programs, UT started to offer fully online master’s programs in 2013, namely Master of Management, Master of Public Administration, and Master of Fisheries Management. It is expected that at the end of 2017, the fully online master’s programs will also be integrated with tablet-based learning materials.

Regarding the goal of providing online community services through the offering of massive open online courses or MOOCs, UT launched its first four MOOCs in 2014 through UT’s website. To increase the visibility of its MOOCs, UT decided to collaborate with an Indonesian MOOC platform called Indonesia X to also offer its MOOCs through their platform. As a result, the registration for UT’s MOOCs increased from a range of 80–250 participants to over 1000 participants per course. This MOOCs provision is envisioned to deliver UT’s promise for community services, providing free courses to the masses.

In accordance with the target of having all online learning supports accessible through a variety of communication devices, including mobile devices, UT continuously explores the different devices for extension of services. By the end of 2013, the main online service, that is the online tutorial, was already accessible through mobile devices. Based on a survey conducted by Padmo, Idrus, and Ardiasih (2015), it was revealed that 94% of the surveyed students often accessed online tutorials through their mobile devices (laptops, tablets, and smartphones). This data reinforces the belief that to enhance the optimal utilization by students, online learning services should be made available using various devices including mobile devices.

5 Sustainability of ICT-Supported Innovation Policies

Sustainability is one of the key principles for implementing ICT innovations at UT, as explicitly stated in the strategic and operational plans. This is to ensure that policies and programs of innovation in the use of ICT in both the administrative and academic aspects will take place continuously. Therefore, the stages of conceptualizing, developing, implementing, and evaluating are emphasized for all innovations at UT. The preparation of human resources is included in all these stages through various training programs for both the developers and users. For this, UT allocates sufficient funds for the whole process including for procurement and maintenance of ICT hardware and various applications, for various training programs, and procurement of any outsourced developments.

5.1 Human Resource Training and Development

As mentioned above one of the essential aspects to ensure the sustainability of ICT implementation in UT is the human resources training and development. These activities are carried out for all UT's human resources associated with the use of various ICT applications, as outlined in the operational plans both for administration and learning system.

A number of training activities associated with the use of ICT are carried out consistently and continuously, and include, among others training for: online tutoring, web-based infrastructure, Linux, UX Design, search engine optimization, service-oriented architecture, web design, Drupal programming, Data Quality Control, student records system, video conferencing system, optical fiber, and creating interactive multimedia. These training programs were carried out to ensure the readiness of UT's staff or external parties, who help UT to provide services or develop various computer applications. These types of training programs are and will be conducted regularly to ensure the sustainability of ICT-supported programs and services.

5.2 Budget Allocation for ICT Development and Implementation

Funding is an essential consideration in ensuring sustainability. UT has been consistently allocating sufficient funds for the purpose of ICT-related innovations and solutions, starting from the development of the grand design of ICT UT, the development of the applications, procurement of hardware and services related to the implementation of ICT, the cost of operations, such as annual payments of Internet network and communications, as well as funding for training and preparation of human resources in order to take advantage of related applications. Table 6.5 shows the budget allocation for ICT development and implementation for the 3 years 2013 to 2015.

As shown in Table 6.5, the budget allocation for the development and implementation of ICT-related programs is considerably adequate, with an average total allocation around IDR32.7 billion (around USD2.4 million) per year. As the table shows, a substantial amount is allocated for the cost of Internet connection, procurement of hardware and software, and maintenance of all ICT-related equipment and networking. In addition, the budget allocation for training is also adequate ensuring the sustainability of innovation in the utilization of ICT.

Table 6.5 Budget allocation for ICT development and implementation in Indonesian Rupiah (IDR)^a

No	Activities	2013	2014	2015
1	Development of grand design ICT UT			3,210,400,000
2	Consultant for computer system design, database, computer programming, computer network	540,000,000	486,000,000	–
3	Procurement of ICT equipment	15,000,000,000	12,500,000,000	12,500,000,000
4	Computer maintenance	4,028,971,000	5,996,950,000	6,177,950,000
5	Establishment of Call Center	–	4000,000,000	–
6	Development of TIER 3 UT's Data Center	2,750,000,000	–	–
7	Internet connection	9,572,640,000	10,000,000,000	10,000,000,000
8	Training on ICT	536,179,000	535,059,000	311,642,000
	Total	32,427,790,000	33,518,009,000	32,199,992,000

^a1 US\$ = 13.000 IDR

6 Closing Remarks

The challenges of providing education to a large population (millions) scattered across nearly 17,000 islands are innumerable. ICT are at the core of the open education movement, as they are thought to break down various barriers or critical impediments to the access to quality education. These impediments are typically socioeconomic and cultural in nature and disproportionately affect the poorest, such as those who are geographically isolated. While open universities have the potential in developing countries to provide opportunities for accessing education, issues of quality, equity, and sustainability remain. Policies must be designed and enacted that address these issues in systematic ways.

In a distance learning institution with over 400,000 students and with a wide scope of services throughout Indonesia and abroad, ICT becomes a necessity. At Universitas Terbuka, innovation in relation to the use of ICT is based on the ICT grand design and the university's Strategic Plan for 2010–2021 (Universitas Terbuka, 2011a, 2011b, 2014a). Further specification of each innovation is elaborated in the university's various operational plans that provide stages of annual targets of achievement. It is clear that the university's policies for ICT utilization are to improve the quality of learning support services to students. The stages of development and implementation of all activities are well formulated in the operational plans, and the commitment to execute the plans are closely monitored and measured using the stated indicators. All this is to ensure that the policies will produce sustainable innovations in terms of ICT utilizations.

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