Using appropriate new technolgies to enhance distance students' learning at Universitas Terbuka, Indonesia

Editors:	Aminudin Zuhairi	Rahmat Budiman
	Universitas Terbuka	*Universitas Terbuka*
	aminz@mail.ut.ac.id	budiman@mail.ut.ac.id

Abstract

This paper presents a case study on the use of appropriate new technologies to enhance distance students' learning at Universitas Terbuka (UT), a large scale open and distance learning (ODL) system in Indonesia. The use of new technlgies in an emerging nation's context poses challenges in terms of culture, cost, accessibility, resources and other barriers relating to innovation to serve diverse groups of students. Along with the use of the traditional printed materials and face-to-face tutorial supports, various kinds of technlgies have been used to enhance students' learning at a distance, including online tutorials, web-based materials, online examination, and other online services. Approriate new technologies can be used wisely and effectively to support distance learning in an emerging nation's context. UT needs to adopt and adapt new technologies to suit the diverse needs of its students and keep exploring innovations in using new technologies to support distance students' learning. This paper is extracted from an official document entitled: *Universitas Terbuka 25 years of making higher education open for all Indonesians* with permission of the Rector of Universitas Terbuka.

Country and institutional context

Indonesia is the largest archipelago and fourth largest nation in the world with a total of over 224 million people living in about 4,000 of total 17,000 islands located along the equatorial line in South-East Asia. According to the UNDP *Human Development Report 2008,* the country ranks 111th or medium in the 2009 human development index, with a GDP per capita of US\$ 3,712 (PPP), and an education index of 0.84. The Indonesian higher education system has for a long time included state and private institutions. The state higher education system comprises 82 institutions and one state national open university, i.e., Universitas Terbuka (UT). The private higher education system includes 2,545 institutions. The national higher education system accommodates more than 4.5 million students, comprising about 1.67 million students in the state higher education system, 2.27 million students in the private higher education system, and 0.6 million students in state higher education institutions operated by the government outside the Ministry of National Education jurisdiction. The national participation rate in higher education is about 15 per cent. Since 2009, legal reform has been introduced to change legal status of higher education institutions to become autonomous state-owned institutions as separate legal entities through the new Law of Educational Institutions as Legal Entities 2009 which has required the institutions to transform themselves as legal entities within a maximum of four years, or by 2012.

Despite the high demand for access to higher education, UT serves as a sole national open university, to cater for the nation's needs for quality ODL at the university level. Established on the 4th of September 1984 as the 45th state university in Indonesia, UT is a single-mode distance teaching university with its main missions have been to upgrade the qualifications of in-service teachers and to provide improved access to quality higher education to working adults and recent high school graduates.

During the first 25 years of its life, UT has developed to become a substantially large open university, or mega-university, enrolling significant number of adult students residing within the country as well as Indonesian nationals living throughout the world. In 2009, UT has an enrolment of over 640,000 students, and so far it has produced over 750,000 alumni, working in various fields of the profession. UT has four Faculties and a Graduate School, i.e., Faculty of Teacher Training and Educational Science, Faculty of mathematics and Natural Science, Faculty of Social and Political Science, and Faculty of Economics. The Graduate School has increasingly growing number of graduate students, currently offering Masters Programs in Management, Public Administration, and Fishery Management.

UT operations involve internal and external networking arrangement. Internally, UT has 37 Regional Offices located in every province of the country, with planning, control and operational management from its headquarter in Jakarta. The UT human resources include a total of over 1,800 staff, distributed almost evenly in Head Office and its 37 Regional Offices. UT further employs course authors, test item writers, tutors, and supervisors on contractual basis in partnership with local public and private universities as well other institutions. Externally, it has networking with various organisations, including with state and private universities for course and test item development, the Post Office and cargo companies for the delivery of learning materials, with television and radio network for broadcasting its programs, local governments and offices for securing students' sponsorship, and other organisation for various purposes.

Use of new technologies at Universitas Terbuka

The *2005-2020 Strategic Plan* and *2005-2010 Operational Plan* of UT focus on continuous improvement in academic quality and relevance, access to services, and internal management (UT, 2004; 2004a). Provision of learning support services is essential, and this will be achieved through increased number of access points to services, improved quality of service and network of partnership, image building, and quality assurance.

Access to a variety of learning support services by distance students has to be improved to ensure quality learning process so that students have the motivation to develop independent learning capacity through self-direction. The institution responsibility is to design effective learning support system which encourages students to initiate learning and develop independent learning culture using a variety of methods and appropriate technologies involving capacity building of students, study groups, provision of various kinds of learning and support services for students, and use of new technologies. Enhancing access to services by students is conducted through improving the human resource competencies, enhancing roles of Regional Offices, increasing the number of access points, and establishing partnership with local resources. Widening accessibility and improving quality of services can be enhanced through the use of new technologies. Educating distance learners on the use of new technologies becomes critical, and it must involve stakeholders.

UT has been at the forefront of innovation in the use of internet-based teaching and learning, as a pioneer in the Indonesian higher education sector, in which a substantial student segment still does not have easy access to the internet. However, UT's experience in developing the use of internet in distance education might well illustrate the case wherein the use of the internet for teaching and learning at a distance has been continuously enhanced and improved to note student benefit and also with an increasing trend of using online learning services by UT students. UT has implemented and continuously improved its online services, including those designed for tutorials, web-based supplementary materials, self-exercise, examination results dissemination, online counseling, information dissemination, and online examination. Other online services are being developed to improve teaching and learning as well as administrative services for students.

Students' characteristics

Students of UT are categorised into *Pendas* and *Non-Pendas* Programs. *Non-Pendas* programs are program offered by faculties other than Faculty of Teacher Training & Educational Science while *Pendas* program is offered by Faculty of Teacher Training & Educational Science which manages programs for primary school teachers (known as S1 PGSD) and early childhood education teachers (known as S1 PGPAUD). In 2009, over 600,000 students, residing in different parts of the country and some overseas locations enrolled in UT. Over 95% of these students are working adults. UT has major roles to play in developing high-calibre human resources needed for the nation's sustainable development. Since its foundation, UT has enrolled over 1.5 million students and has produced over 1 million alumni, working in various professional fields. The following figure shows the trend of students enrolment from 1984 up to 2009.
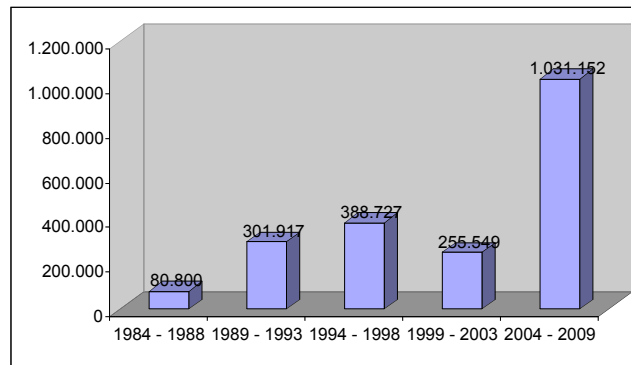
Table 1. Trends of Student Enrolment

The number of students in the *Pendas* program is much higher than the *Non-Pendas* program due to the provision of scholarships from both the central and district governments. The active students in 2009.2 are 622,957, of which 536,974 students are those of *Pendas* Program. Active student is defined as student who registers at least one course in four semesters consecutively. The figure below shows that out of those 622,957 active students, only 477,989 (76.73%) students are actually taking courses (register) in the Semester of 2009.2. The registered students consist of 66,829 *Non-Pendas* and 411,160 from *Pendas* students.
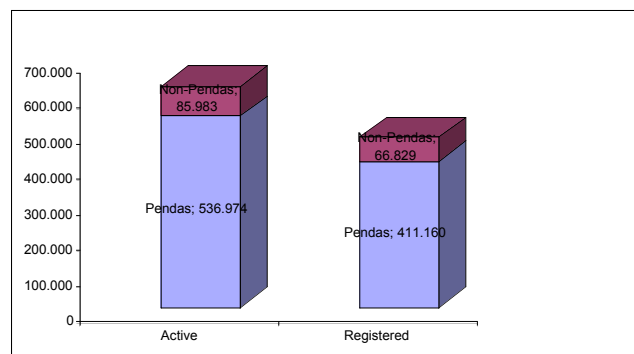

Figure 1. Number of Active and Registered Students

The large number of alumni reflects that UT has successfully carried out its three main missions namely: (1) to widen access to higher education, especially for recent graduates of senior high schools, (2) to train increasing numbers of students in areas demanded by the economic and cultural development of the country, and (3) to upgrade primary and secondary school teachers who graduated from short-term programs to enable them to obtain the full-teaching degree. Total number of UT alumni is 996,728 in 2009.2. In line with the students' occupational status, UT alumni also occupy various important positions either in government institutions or in private sectors.

In order to maintain and modernise alumni database, UT conducts a tracer study which the objectives are: (1) distribution of alumni, (2) activities of alumni, (3) position and role of alumni in the society, and (4) stakeholders' opinions of UT alumni. The data, furthermore, can be used to fulfill the National Accreditation Board of Higher Education (BAN-PT) requirements that each higher education institution has to possess the newest information about the alumni.

Based on the experience of carrying out tracer studies for 3 years, then in 2009 UT began conducting exit survey. In the survey, questionnaires are distributed to newly graduates to directly capture information on: 1) the current address and occupation, 2) the reason for studying in UT, 3) the initial interest of becoming UT student, 4) the reason for choosing study programs, and 5) the satisfaction of the whole UT service. In the short future, the exit survey will be offered online and the alumni will be able to update their profiles independently so that the UT alumni will be always up to date.

Enhancing distance students' learning through the use of new technologies

Teaching and learning by distance mode at UT has been designed in such a way to enable the development of students' independent learning. Printed materials supplemented with non-print media and broadcast are the usual media for many open universities including UT. More recently teaching and learning at a distance has been enhanced with various kinds of online and asynchronous media using the internet, such as online tutorials, web-based materials, online counseling, online independent assignments, online examination, and online programs.

Multimedia learning packages. To enhance the quality of learning process, UT has developed multimedia learning packages, integrating printed and non-printed (audio, visual, and/or computer-assisted) materials for students' independent learning. The learning package is self-instructional, and so far more than 240 courses have been developed in multimedia package formats. A course team approach has been used in developing the materials to ensure quality. Revision is done to ensure that the content is updated, and life span of the courses must be less than seven years.

Broadcast programs. Broadcast programs include television and radio programs that are still widely used in Indonesia. TV programs have been used to deliver content to a very large number of students residing in various locations throughout the country. Television programs have been produced with a normal duration of 30 minutes in various formats, including features, talk shows, single presentations, and interviews. Radio programs can reach remote students to enhance learning process. Partnerships are developed to broadcast programs with national and local, or community and private television and radio networks throughout the country.

Online tutorials. Provision of online tutorial support for UT distance students is one way of enhancing learning process. During the year 2009, 516 undergraduate courses are supported with online tutorials to facilitate learning for students who have access to new technologies. The number of courses supported with online tutorials grow from year to year, and so is the number of participating students in online tutorials. Participation in online tutorrial for undergraduate courses are voluntary. In the meantime, all of UT graduate level courses are supported with compulsory participation in online tutorials.

To enhance distance learning process, online tutorial is designed for a period of 8 weeks in one semester, in which online initiation materials is presented to students every week by the tutor. Students are given three assignments during one semester, on week 3, 5 and 7 respectively, to be submitted to tutor for feedback and scoring. The assignment and participation score s contribute up to 30 % to the final semester grade of the course. Online tutorial is compulsory requirement for all post-graduate courses, and it is integrated with the face-to-face tutorial mode, and is voluntary for undergraduate courses. The students' constraints to actively engage in online tutorials are attributed to factors relating to the cost of internet access and the limited accessibility to internet due to the poor quality of information and technology infrastructure in Indonesia.

Cost is one of the main constraints of students in using UT online facility, even though online learning support can be used to overcome the constraints of distance and time. There has been increasing trend of participation in online tutorial. The number of courses and students who participate in the online tutorial from 2005 to 2008 increased significantly. Meanwhile, the rate of online tutorial participation from students has fluctuated. In 2007, courses offered in online tutorials increased 23.1%, and increased 12.6% in 2008. In other words, the courses increased 15% in 4 years. In 2009, there was a decrease because online tutorials for some practical courses were not offered through online but in the form of face-to-face tutorials. The number of students who participate in online tutorials raised 500.1% in 2006, but in 2007, decreased 40%. Finally, in 2008, it increased 162.8%. During the second semester of 2008, there were 547 courses supported by online tutorials, and 33,091 students accessed the online tutorials (UT, 2009).

Web Supplements. Web supplements are used to enrich and update existing printed materials, and are accessible to students through the website. Some courses in social sciences, such as tax administration, public policy and finance, need to be revised in a short period of time because of the changing needs of users and government polices. Web supplements are developed to keep the course materials up-to-date and bypass the long process of course revision. Web-based learning materials can also be linked with other relevant online learning resources, discussion groups, or mailing lists.

Online examination. To provide students with a more flexible and secured examination process, in 2009.1, UT has developed an internet-based examination system, referred to as online examination, which is an improvement over the Computer Based Examination (CBE). The main difference between CBE and the online examination lies on the item retrieval process. For the CBE, the item retrieval and test construction process are carried out at the Examination Centre and then the digital files of these item sets are sent and stored in the Regional Office computer server awaiting use.

For the online examination, a certain subset of items is uploaded to a different server that serves as a mirror of the item bank. Retrieval of items and construction of tests are directly processed through the server which can be directly accessed by the Regional Offices. Pilot testing of the online examination system was carried out in 2009.2 in 6 Regional Offices. By 2010.1 the online examination with approximately 600 available courses should be offered at 12 Regional Offices. To increase the efficiency and accuracy of assessing student's ability, especially for the fully online courses, the online examination should be geared towards the use of adaptive testing or tailor-made testing that suits the specific needs of students accessibility. Adaptive testing will enable students to receive test items that are suited to their ability and thus will result in a much shorter test.

Other online learning support services. UT also provides other learning support services that complement and enrich the process of student learning. Several other websites have been developed and integrated into UT's portal, such as *Portal Guru Pintar Online* (Online Smart Teacher Portal) and *Portal E-Humaniora* (Portal E-Humanities), which contain features and facilities to strengthen the learning process through clinical counselling based on real cases in some aspects of courses. In addition, the online learning services also include provision of supplementary learning materials, open courseware as well as links to various open educational resources available in the internet.

Online programs to widen access to quality higher education

Delivering programs online is an option to widen access to quality higher education. Diverse groups of students can be met to suit their needs for flexible learning. Within the past two years, UT has been working on selecting and developing two programs to be delivered entirely online, i.e., the Master of Management (MM) and Bahasa Indonesia for non-native speakers (BIPA).

*Master of Management (MM) Online Program.*The MM Online Program has been designed to respond to the needs of students residing throughout Indonesia, overcoming the barriers of attendance in face-to-face tutorials. These typical students may be living in remote areas, or working overseas. The MM Online Program is intended to transform the regular MM program into a hybrid multimodal learning system. In this way, UT can offer alternatives to prospective students to choose the most suitable program mode.

The MM Online instructional system has been developed by a team involving lecturers, curriculum and instructional designers, web designers and multimedia developers. The program has been constructed in several phases, and a resulting prototype, a full-fledged elearning module for Business Research Methods, will later be used as a model for the development of other courses. The program follows the general pattern of the MM traditional distance learning program, which requires independent learning by self-study of the printed and non-printed material, four (4) face-to-face tutorials, eight (8) online tutorials, and assessments. In the MM Online Program, face-to-face tutorials will be replaced by more online tutorials, in the form of more intensive discussion of material, and more in-depth assignments, and other forms of online communication, such as the use of blogs, synchronous communication, and video conference.

The development process of the course began by mapping the overall strategy and content of the learning process, then by breaking down the course into lessons. The course contains eight lessons, each lesson contains introduction of the lecturer in charge of the lesson, learning 'triggers' in the form UT online learning centre website of key issues for discussion, supplementary references (articles or multimedia programs), assignments and wrap-up sessions. Printed material, as the main learning material, will be provided to the students, studied in tandem with the online program.

The MM Online Program employs online communication for academic services, beginning at registration, online tutorials and online assessment. By design, program student activities can be implemented anytime and anywhere, as long as students have access to the internet. In the later part of the program, i.e. thesis writing, some residential, face-to-face components will be included. In order to provide students with optimal references and support to learn effectively, there are links to digital sources of journals, ebooks and relevant open source material, and to the existing *JARDIKNAS* (National Education Network) and IMHERE (Indonesia Managing Higher Education Resources), all for extending reach and building resource capacity.

Bahasa Indonesia for Non-native Speakers (BIPA). Bahasa Indonesia for Non-native Speakers of Bahasa Indonesia (*Bahasa Indonesia untuk Penutur Asing Universitas Terbuka* or *BIPA-UT*) was launched in June 2009. This language program is designed for non-native speakers of Bahasa Indonesia through the online system at *Universitas Terbuka* (UT) and offers systematic and comprehensive online courses that will enable the participants to learn Indonesian (*Bahasa Indonesia*) effectively and efficiently at their convenience. The program is delivered through the E-learning platform including multimedia learning materials, assignments and learning activities which stimulate

language competence in listening, reading, writing, and speaking in Indonesian. The competent and professional tutors of BIPA-UT assist the participants in learning the material in a meaningful and enjoyable atmosphere.

This certificate program is designed to give opportunities for non-native speakers of Indonesian to learn *Bahasa Indonesia* through the online system. The competencies expected from the participants are (a) pronouncing the Indonesian vowels and consonants, words and understanding the basic form of sentences, (b) communicating using *Bahasa Indonesia* in informal communication for daily interaction, (c) using *Bahasa Indonesia* in formal communications, and (d) using *Bahasa Indonesia* for academic purposes and presenting papers and proposals in formal interactions or business interaction. This program is designed for foreigners who wish to learn Indonesian, are at least 17 years old, and understand English.

The BIPA-UT Certificate Program employs an open and distance learning system in which participants are required to implement self-directed learning. The open and distance learning system enables the participants to proceed at their own pace. Various media, such as web materials, audio, and video, permit the participants to enhance their knowledge and skills using various modes of learning. To gain optimum results from the learning process, the program provides online tutorials in a six or nine week period. Each week the participants are to learn a topic initiated by the tutor and then they do some assignments and read other supporting/learning materials. It is recommended to remain active and engaged with course materials every week. The participants are expected to be online several times every week for an hour or more each time.

The learning system for a BIPA-UT Program is implemented based on scheduled online tutorials. The participants are encouraged and motivated to learn the material by themselves through self-learning, facilitated by supplementary materials, additional practice, and other supporting materials such as downloadable dictionaries and software for learning BIPA online. The number of online tutorials differs from each course depending on the competency requirements of the course as indicated by the number of credits in each course. The online tutorial in BIPA-UT applies a team of tutors in a course. It means that one course in BIPA-UT will be delivered and managed by a team consisting of one course manager and some tutors. A course manager is the leader in the implementation of tutorials in one course. The course manager's duties are to coordinate tutors in planning the scenario for online tutorials; developing assignments and determining evaluation; developing assessment of student learning, marking and correcting; sending online tutorial grades based on content, participation and overall result; and writing reports for the implementation of the online tutorial for certain courses. A tutor's duties are conducting the online tutorial, designing and giving assignments, designing and correcting assignments, managing discussion forums and chatting for teaching and learning, providing academic and administrative services for the participants, reporting all grades to the course manager.

Preparing online tutorials consists of planning the implementation of the online tutorial as coordinated by the Institute of Research and Community Services (*Lembaga Penelitian dan Pengabdian kepada Masyarakat* or LPPM), gathering together the team of tutors and course manager, giving orientation to the tutors and course manager, preparing the online tutorial system in BIPA-UT, trying out and finalising the online tutorial system in BIPA-UT, deciding on the schedule for the online tutorial, and finally activating the online tutorial for BIPA-UT.

The participants who have been accepted into the BIPA-UT program can access the full course by entering through their personal usernames and passwords to login and access all enrolled courses. Evaluation is conducted to measure the learner's achievement through the learning processes of the language course objectives. There are two kinds of learning assessment: namely content assessment and final assessment, in form of an objective test and/or essay test.

The content assessment is conducted on a weekly basis to assess the learners' learning achievement of a specific module's objectives. The number of these tests depends on the number of course credits. The final assessment is conducted once every semester at the end of the course tutorials. The final grade for each course will be based on a percentage. The final grades will be announced to every student through email. The final grades are based on the cumulative of test scores. The assessment results will be announced to the students so that they can monitor their own achievement and motivate themselves to study independently. Any feedback obtained is evaluated against module objectives.

Prospects and future development in using new technologies

The major challenge for UT is to provide quality university education at a distance, accessible to students from different economic backgrounds, to maintain access to resources through the information and communication technology (ICT) facilities, and to decrease a low ICT literacy. Since

2002 UT has launched UT Online services, aiming at introducing web-based academic and administrative services for students. UT has conducted socialisation and training in online learning services to improve ICT literacy of the students. In the future, UT distance services will very much depend on the development and enhanced uses of ICT. Educating distance students and the society at large to use new technology for lifelong learning is one major challenge for UT.

UT has continued to improve the capacity of its online programs and services, and has developed and applied an intranet to be used in teaching and learning, management, and other services. The intranet covers both Head Office and Regional Offices. To enhance its online services, UT has also launched mobile learning services (mlearning) to accommodate students' needs for flexibility and online customer relationship management (CRM) to ensure customer expectations can be effectively met. Upgrading of ICT infrastructure and facilities as well capacity building of all staff is the UT's main priority so that the institution and its staff can anticipate changing needs of students and stakeholders and advances in new technologies.

Target audiences for CRM service application are students, staff, and others who are willing to have their problems solved by UT through an online application system. Through this application, students can ask for help to solve their problems in many aspects such as in registration, tutorials, and student examinations. To start this service, the customers can login to the program and write their problem on the New Ticket Gate. The program will automatically give the customers a complaint ticket number which functions for checking responses via the same webpage of the application. Responses are also sent through email directly to the customers. As a pilot project, the application will only be implemented for UT staff. This will help the staff become accustomed to the program.

In the future, new technologies will be used more intensively to enhance teaching and learning as well as to ensure effective and efficient management of a large Open University system. New technologies that have developed and utilised include such things as virtual laboratory for science courses, more extensive uses of online examination system, online registration, and further possibilities that new technologies allow for an ODL system to operate effectively. Some future developments of UT can be described as the following.

Academic programs. In terms of academic areas, UT has focused its future plans on the following programs. UT is considering to digitise its learning materials accessible by students online, to respond to the global movement for the use of Open Educational Resources (OER). There are issues to take into account relating to copyright, access rights, and the cost impacts of opening up access to learning materials in digital formats. Continuing education programs are also on UT priority lists, as there seem to be increasing demands for such programs in response to the needs for lifelong learning. These continuing education programs focus on certificate or non-degree programs. Graduate programs will also be the future direction for UT academic program development. In the near future up to 10 masters programs and a number of doctoral programs will be offered within the next three years. To ensure credibility of UT's academic programs, accreditation of all study programs will be sought from the National Accreditation Board for Higher Education, as well as other independent international accreditation body.

Enhancing examination system. Online examination has become the future target to achieve by UT to provide quality and secure examination that allows for flexibility for the students in taking the examination. The preparation and production process of the examination papers is undergoing modernisation through the use of digital printing that allows the printing of individualised examination papers for students. The Examination Centre is also preparing the database of cases for examination results in which problems or cases can be identified, categorised and followed up accordingly to respond to students' queries satisfactorily. A management information system for examination papers (*Sistem Informasi Bahan Ujian* or *SIMBU*) is currently under construction. Following the format that has been developed for management information system for learning materials, *SIMBU* will be used as effective information database of test items, life cycle, usage, writers, and so forth for use in decision making for the development and use of examination papers for specific semester examination.

Information technology uses. The future IT uses in UT is aimed at improving teaching and learning services and supporting efficient management for a large open university. The UT uses of IT-based database and networking will be enhanced. The UT will establish a live back-up of database unit in HO outside the Computer Centre Building. Another important plan is to develop data centre for HO to ensure that all data is maintained by the Computer Centre. To enhance effectiveness of IT services, UT will also develop IT Help Desk services under the management of the Computer Centre. In the near future, an electronic billing system for payment of students' fees in cooperation with partner banks will be developed to facilitate electronic and online payment of fees by students. The use of IP-telephone utilising the existing VPN (Virtual Private Network) will be applied with the aim to minimise operational cost of the institution and optimise the use of VPN. The IVR (Interactive Voice Response)

will be further developed to enhance student support services and thus minimise costs on the part of the students. The LAN capacity will be enhanced to control transactions and networking in HO. Online registration will be implemented to improve services to students with internet access.

Conclusions

Despite the fact that Indonesia still suffers from the limited ICT infrastructure within easy access by the public, including UT students, it is obvious that there have been increasing trends in uses of new technologies in various fields, including in open and distance learning. UT responsds to the increasing uses of technology to enhance teaching and learning at distance through various online courses and services. In the future, new open and distance learning will depends upon greater uses of technology, and UT has to continuously innovate and improve its learning and teaching technology, invest in new technologies, and develop its human resources to suit the needs for new technology uses. Any open and distance learning institution, including UT, should anticipate advances in new technologies, and wisely use appropriate new technologies for teaching and learning that meet the needs and requirements of the students which it serves.

The Editors

Aminudin Zuhairi is Head of Institute of Learning Materials Development, Examination and Information System and senior lecturer in distance education; and *Rahmat Budiman* is a lecturer in English Language and Literature Department, all of them at Universitas Terbuka, Indonesia.