# LEGAL FOUNDATIONS, PEDAGOGICAL CHALLENGES, AND TECHNOLOGICAL CONSTRAINTS OF DISTANCE EDUCATION IN INDONESIA

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## ABSTRACT

This paper addresses legal foundations, pedagogical challenges, and technological constraints of distance education in Indonesia. Legal reform and policy changes in education have taken place recently in Indonesia, including the ratification of new Laws and regulations in education. These changes have effects on distance education as part of the effort to meet the right to education for its citizens. Distance education is expected to respond to challenges in effective implementation of lifelong learning. Despite some constraints, technology is used in distance education to enhance the implementation of the right to education. Distance education should help reach out the disadvantaged groups of the society and serve as the catalyst in the establishment of a knowledge-based society in Indonesia.

## CONTEXT AND BACKGROUND

Responding to the challenge of human resource development for nation building has been an enormous task for Indonesia. It has been stated in the Indonesian Constitution of 1945 that education is the basic right of every citizen. However, providing access, equity, equality of opportunity and participation in quality education for all citizens is still yet to be accomplished. The demographic characteristics of Indonesia as an island nation with deprived communication and transportation infrastructures have made distance education an alluring testing ground for effective use of distance education system. Distance education in Indonesia has flourished as an attempt to meet the national needs for improved equity and access to quality education, bearing in mind important factors relating to the geography, demography, socio-economy, culture of its society, and availability of technology. Distance education has been used in formal as well as in non-formal education, in academic as well as in professional education, and in primary, secondary and higher education. It has continually evolved, starting with the use of print-based correspondence material in the early fifties, through multi-media learning materials, and currently to increased uses of new information and communication technology (ICT).

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The origin of distance education in Indonesia has its roots in the establishment of correspondence teacher training program in 1950 in Bandung, West Java. Further intensive use of distance education has taken place since the 1970s, and has since then continued until today. In 1984, *Universitas Terbuka (UT)* was established as a national open university system to provide higher education for all, particularly for in-service teachers, working adults and high school graduates. The introduction of the nine-year compulsory education in 1994 had a major impact on the upgrading of in-service primary school teachers which then by law required at least two-year training at the university level. The task of upgrading this group of in-service teachers at a distance has been assigned to UT to ensure that the teaching and learning process could remain taking place in primary schools. With the introduction of the new Law of School Teacher and University Lecturer in 2005, all school teachers must have university degrees, and all university lecturers must have at least Master's degrees. This new Law has effects on the upgrading of the qualifications of teachers up to university degrees using distance education system.

Recent advances in the use of ICT in higher education and the growing demand of stakeholders have encouraged campus-based universities in Indonesia to experiment with distance education programs to support and enrich classroom-based teaching and learning. In the beginning of 2007, as part of the effort to accelerate the upgrading of teachers' qualifications, the Government of Indonesia has facilitated the establishment of a distance education consortium comprising of ten universities. Then more recently, the government of Indonesia has further established a consortium of 23 institutions as part of the effort to accelerate the upgrading of the qualifications of in-service primary school teachers using distance education system. It is interesting to observe these initiatives in distance education will continue to flourish and sustain themselves. It is certain that distance education has enhanced roles in contributing to the implementation of the right to higher education in Indonesia.

## LEGAL FOUNDATIONS

As stated in the Constitution, education is the basic right of every citizen, and Indonesia has applied distance education to improve access to quality education at all levels and sectors. Constitutional mandate has been followed up by the government with Laws and Regulations have been drafted and implemented to ensure that this constitutional mandate can be fulfilled. It has also been clearly stated in the Preamble of the Constitution that the Republic of Indonesia has been established to develop an intelligent nation. Indonesia has continually improved the quality of its educational system, implemented the 9-year compulsory education, and used distance education to support the achievement of compulsory education. Significant legal reforms in education have taken place in Indonesia recently, beginning with the ratification of the new Law of National Education System 2003. Then, with the recent implementation of the Law of Teacher and Lecturer 2005, the Government Regulation on Teacher 2008 has been introduced, and the Government policies have been implemented for teachers to upgrade their qualifications up to the university degree level. Distance education has had continued important roles in fulfilling the right of teachers working in remote areas to upgrade their qualifications through distance education up to the university degree level.

The government has to work hard to implement the right to education for its citizens in response to the human right charter. The right to education includes among other full implementation of compulsory education for up to year 9 of formal schooling, improved access to secondary education through various means of pedagogical methods, widened access to higher education through distance education system, and improved non-formal educational system at a distance focusing on literacy program. Distance education can be an effective instrument for ensuring that the right to education to fulfil the needs of the Indonesian society.

The constitutional foundation of education has been clearly stated in the Preamble of the 1945 Constitution of the Republic of Indonesia that one of the main goals of the Republic is to establish intelligent life of the nation. The subject of education is further addressed in Chapter XIII Article 31 of the Constitution, stating in point (1) that "Every citizen has the right to education", and in point (2) that "The government provides and administers a national education system regulated by the law". In response to the changing needs of the society, significant constitutional, legal and administrative reforms as well as policy changes have taken place since 1998. In 2002, Amendment 4 of the 1945 Constitution was added, and Chapter XIII Article 31 addressing educational matters extended from 2 points to become 5 points, which are elaborated in specific, well-defined and measurable statements in the amended Constitution as the followings.

- ➢ Every citizen has the right to education.
- ➢ Every citizen is compelled to attend primary education and the government has the obligation to fund it.
- ➢ The government provides and administers an educational system, which aims to enhance spiritual belief and obedience as well as respectable behaviour in connection with the establishment of intelligent life of the nation such as regulated by the law.
- ➢ The state gives priority to the allocation of budget for education up to a minimum of 20% of the total budget of the state as well as provincial/district budget in order to meet the provision of national education.
- ➢ The state advances science and technology through adhering to high religious values and national unity for the sake of the advancement of human civilization and prosperity.

It is thus clear that all citizens are granted the right to education, and the government has the obligation to administer and meet the educational needs of the citizens. It is the government's responsibility to establish an intelligent of the nation as mandated by the Constitution's Preamble. The state is also obliged to allocate budget for education up to a minimum 20% of the total state budget. Such measurable criteria for educational budget allocation will have to be the government to ensure that national unity and prosperity can be achieved.

Chapter III of the Law of Education 2003 Article 4 states the principles of education as applied in the Republic of Indonesia, which gives the basic foundations of educational practice in different sectors and levels, as the following.

- Education is conducted democratically and justly and indiscriminatingly, upholding human rights, religious values, cultural values, and national diversities.
- Education is conducted as a systemic unity using open system and ensuring multiple meanings.
- Education is conducted as a process of cultural development and empowerment of students and is continuous lifelong learning process.
- Education is conducted through setting of good examples, establishing goodwill, and developing creativity of students in the learning process.
- Education is conducted to develop the cultural literacy (reading, writing, and arithmetic) of the citizens.
- Education is conducted by empowering all societal components through participation in implementation and quality assurance of educational services.

As regards distance education, the mandate stated in the 1945 Constitution of the Republic of Indonesia is translated into the reformed Law of Education 2003, in which distance education is specifically addressed in Chapter 10 Article 31 in 4 points as the followings.

- Distance education is administered in different streams, levels and types of education.
- Distance education has the function to provide educational services to the group of society who is unable to attend face-to-face or regular education.
- Distance education is administered in a variety of forms, modes, and scopes supported by learning facilities and services as well as assessment system which assure the quality of graduates in accordance with the national educational standard.
- All matters regarding the administration of distance education as stated in points (1), (2), and (3) will be further directed in government regulations.

The Law of Education 2003 is to be implemented with proper Government Regulations Government Regulation on Higher Education, Government Regulation on Compulsory Education, Government Regulation on Primary and Secondary Education, and Government Regulation on Distance Education. Although the new Law of Education has been introduced since 2003, it has taken some time to translate them into relevant Government Regulations. Discussions between the Government and the Parliament for the construction of these Government Regulations are still in progress up until now to issue the proper and relevant Government Regulations.

Then in response to the changing needs of the society the Law of Education and as Legal Entity has been introduced since 2009. The new Law has required all educations institutions to transform themselves to become legal entities, and the government has set up time frame until the year 2014 at the latest. As stated in Chapter 2 Article 2 of the 2009 Law, the educational institution as a legal entity has the function to give formal educational services to students. Then, Article 3 further states that the purpose of the educational institution as a legal entity is to advance national education through implementation of school based management in primary and secondary education, and autonomy in higher education.

Article 4 (1) elaborates independent financial management by the educational institution as a legal entity is based on the not-for-profit principle, meaning that the principle of the educational activity is not aimed at making profit, so that profits

generated from the revenues must be re-invested to develop the capacity and quality of educational services of the legal entity.

Then, Article 4 (2) of the 2009 Law further stipulates nine principles in the overall management of the educational institution as a legal entity, namely autonomy, accountability, transparency, quality assurance, services to stakeholders, access, diversity, continuity, and participation. The educational institution as a legal entity can be owned by the government and/or the society, all of which must respect the 2009 Law. All educational institutions as legal entities will have to meet these principles in their operational activities. This new Law is an effort by the government to grant greater autonomy to institutions with responsibilities rest with the Government to ensure participation of citizens in educational process at all levels and sectors as required by the Law.

Recent legal and administrative reform in Indonesia has had significant effects on the governance and regulations in the public sector. Based on the review of the existing legal and regulatory documents, it seems that these will provide stronger foundations to support the roles of distance education in the implementation of the right to education in Indonesia.

## PEDAGOGICAL CHALLENGES

Distance education has been established on the grounds that there are interaction and communication processes, learner's autonomy and independence, and application of industrial management principles. Distance education system operates to provide teaching and learning services to students, using a variety of media and available technology to deliver learning. Contemporary distance education has involved the use of a variety of educational media, including print and non-print media, and it has expanded along with advances in the use of ICT.

In brief, there are pedagogical challenges in implementation of distance education in the Indonesian context to effectively respond to the principles of distance education, and solution has to be sought for. The geographic and demographic conditions, economic capacity, technological infrastructure and facilities of Indonesia reflect good practice of distance education in the most difficult context.

The challenge for communication and interaction is critical as Indonesian learners are those who are socially bound to the face-to-face mode of interaction. Recent advances in information and communication technology (ICT) pose some challenges to train and educate the society in news ways of communication and interaction using new technology, such as the internet and mobile technology. This will take some time for the society and distance learners to have ICT awareness, develop ICT literacy, and eventually familiarise themselves with the use of ICT for communication and interaction in distance learning.

The reading culture of the society also needs to be enhanced. In distance education interaction and communication takes place using a variety of media, particularly in printed and non-printed formats. For the case of Indonesia, distance education uses printed materials as the main learning resources for the students.

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Transforming the society from the oral to reading culture is essential to ensure the success of learning at a distance. The specific challenge Indonesian distance education is to design the learning materials using instructional design principles in such a way that it motivates students to read the materials and facilitates their learning process.

Universitas Terbuka (UT) has been founded to give opportunity to the society irrespective of geographical locations to have access to quality higher education. With the geographic conditions of Indonesia consisting of islands and waters, it gives specific challenges for UT to provide quality higher education to diverse characteristics of its society. These geographical factors have contributed to constraints relating to access to information and communication technology, knowledge, and quality educational resources and services. Distance education is important to promote literacy and reading cultures among the disadvantaged groups within the society.

It is noted that participation rate in higher education is relatively moderate at around 15% level, and this indicates the need to improve access and participation in higher education. The population of Indonesia is predicted to reach 253,7 million people, including some 24,7 million people in the 19-24 years of age group, who needs to have access to quality higher education. Population distribution poses serious challenges for Indonesia, 60% of the people live on the island of Java, which contributes only 6% of Indonesian land areas. Equality of opportunity in education is a challenge to meet through distance education to ensure that people have equal access to quality education irrespective of geographical locations, economic capacities, social and cultural constraints, gender, and physical disabilities.UT gives considerations on aspects related to loneliness and dispersed locations of students learning at a distance, and it has designed  a distance learning system that it facilitates the learning process of students with different social and economic as well as literacy backgrounds, or rural versus urban locations. Multimedia learning materials for distance students have been designed to meet communicative and interactive criteria in order to facilitate students' learning. The UT multimedia learning packages include printed materials supplemented with audiocassettes, video, web-based leaning materials and computer assisted instruction.

The following cases illustrate some of the most recent practice of distance education in Indonesia. Since the new Law of Education was introduced in 2003, the Indonesian Government has targeted that by 2010 all citizens will have at least passed from the compulsory basic education, i.e., a 6-year elementary education plus a 3-year junior secondary education. The challenge of the Indonesian geographical and demographical characteristics has encouraged the use of distance education as the realistic solution to respond to the increasing needs to address the problems of community illiteracies of the Indonesian people. Distance education in Indonesia has a wide spectrum of practice, beyond the formal education sector, to address the illiteracy problem. The government has priority for 16 provinces with serious problems of adult illiteracy through the Illiteracy Elimination Program (*Pemberantasan Buta Aksara*). Since 2006, the UT in-service primary teacher students have been required to take a course with field practicum to eliminate illiteracy in the community.

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A course entitled "Society-based Learning and Instruction" has been offered in the in-service primary teacher education program, intended to provide teachers with the needed competency to actively participate in the "Illiteracy Elimination Program" to abolish adult illiteracies.

Since 1996, UT has developed a course in the multi-grade approach to teaching for handling classroom management in remote schools with limited number of teachers. The multi-grade approach to teachings has been a response to the limited number of competent primary school teachers in primary schools and the limited capacity of the local government particularly in remote areas. The lack of competent teachers also happens in major cities in Indonesia, so that the multi-grade approach to teaching has also been adopted by schools in the city. Some teachers in the city need to apply this approach because they have to substitute other teachers who somehow are unable to conduct classroom teaching because they have to represent the schools in other activities. The multi-grade approach to teaching has also been adopted by in-service teacher students to teach the disadvantaged group, such as street children, of urban communities.

Despite its obvious contribution to the implementation of the right to education, there are challenges relating to how distance education performs this role. When UT started to offer the Bachelor Program (S1) for in-service primary school teachers in 2002, there were initially about 3700 primary teachers enrolled. Each year, the number of in-service primary school teachers enrolling in the Program has increased significantly up to more than 77,000 students in 2007. So far the program has graduated more than about 15,000 in-service primary school teachers with first degrees. On the access to education perspective, it clearly indicates that the UT distance education system can reach a large number of people, which is a performed commitment to fulfil the fundamental right to higher education in Indonesia. Many of the in-service primary teacher students live in district and remote areas, in which access to the face-to-face higher education system is out of question. It would have been impossible for millions of in-service primary school teachers to get appropriate higher education at the Bachelor level while at the same time they have to keep their duties as primary school teachers. Until 2007, more than 1.4 million school teachers need to upgrade their formal teaching qualifications up to the university degree level.

From the point of view of curriculum and instructional system, UT provides courses relevant to the needs of the in-service teachers in performing their daily teaching duties in their classrooms. Courses taught in the Program are applicable in their real classrooms, so that they can gradually improve their skills in that field. In the course "Classroom Action Research" (CAR), for example, students must develop a classroom research proposal, which reflects on what they have done in their classrooms and plan their actions to make improvement. In courses such as "Education of Children in Primary School" and "Introduction to Special Needs in Education", the students learn how to implement the rights of children in the classroom, and how to manage the special needs of children in regular or normal classrooms. One course on "Computer and Instructional Media" introduces new teaching tools and new knowledge through experience. In this particular course, primary teacher students must work on assignments, explore a variety of learning resources from the internet, complete their assignments, and develop abilities in using the new technology.

As many students have neither personal computers nor the required ability to operate the computer, they are required to have access to the internet cafe. Qualified tutors assist them in the learning process. Since 2007 UT has developed an internet portal that is named "*Guru Pintar*" (Clever Teacher), which provides information that can be accessed not only by in-service primary teacher students but also by other teachers and the public interested in school teaching. The scope of the information contained in the *Guru Pintar* relates to knowledge for improving skills of primary teachers. This portal are also enriched with teaching cases and frequently asked questions so that primary teachers can learn from those cases and best practices in primary school teaching.

The UT in-service primary teacher training program is supported by face-to-face tutorials, in which three courses with significant practical work are provided with the face-to-face tutorial components in each semester. The face-to-face tutorial activities are conducted eight sessions per semester for each of the courses. The practical work component is conducted outside the face-to-face tutorial activities. To assure quality, the practical work activity is aimed at improving teaching skills and is supervised by senior teachers who serve as tutors and is conducted in the student's school.

To upgrade tutors' competencies, once a year the UT regional offices conduct the retraining and refreshment activities for tutors, and the training for new tutors. Tutors have crucial roles in ensuring that the student learning process takes place effectively. Tutors must have the ability to motivate students in learning independently, stimulate and encourage them to have critical thinking ability to improve best practices in their schools.

Despite its continual progress and improvement, distance education Indonesia has to respond to pedagogical challenges that relates to the provision of quality educational accessible by its citizens living in diverse regions. Distance learners have diverse backgrounds in terms of access to learning resources, ICT, economic capacity, and opportunities. The promise of distance education is to reach students and open the widest opportunities for the citizens to participate in learning and educational endeavour using its flexible and open methods of teaching and learning.

## TECHNOLOGICAL CONSTRAINTS

Current challenges for distance learners in Indonesia are to have access and familiarise themselves with the new technology, while for distance education institutions are to invest resources in technology, and to provide quality education accessible by students with different levels of economic capacity, access to technology facilities and limited technology literacy. Innovation in the use of technology in distance education is a daunting task because of the limitations in accessibility, availability and cost efficiency of the technology.

The use of appropriate and new technology requires conditions and prerequisites to be met to ensure its viability and sustainability. There are issues to address in connection with the use of technology in Indonesia, relating to the capacity of the institution, accessibility by students, support from stakeholders, students' technology literacy, and capacity level of users' contributions.

ICT has dramatically increased the amount of textual information in recent years. Despite its varied content and quality, information and learning resources can be accessed freely. With the open access to information, the issue is not only on who can get the information, but also on how one can obtain and use the information effectively. The major challenge for Indonesia has been to make technology available and accessible for distance learners, to develop and use ICT appropriately to anticipate the "digital divide threat", and further to transform the threat into challenges known as the "digital opportunity". Indonesia varies greatly in terms of conditions, culture and economic capacity of the different regions, so careful approaches need to be taken in using new technology in distance education. In regions that serve as major centres for business activities, information in both printed and non-printed formats are readily available and easily accessible, while in remote regions that are difficult to reach, those materials are scarce. Learning resources and materials are strategic means for improving educational process as students can use them according to their own paces. New technology is needed to allow for the rapid distribution as well as the repository of large amount of teaching materials and information.

The use of ICT has improved access knowledge and information. The use of ICT has the benefit for content distribution and enhanced interaction and communication between students and teachers and among peers. ICT helps more students learn with less dependence on the number of teachers. However, there is the paradox of access and availability for societies in the developing world. Despite the fact that the technology is readily available, access to technology remains a major challenge for many people in the developing country. For Indonesia as an example, the ICT network infrastructure is still far from adequate for the full potential uses of new technology in education in order to reach the different layers of the community. In 2006, the Human Development Index of Indonesia ranks 110 in the world, with 39.05 millions or 17.75% out of its 220 million citizens still live below the poverty line.

According to the Internet World Statistics (IWS) in 2000, there were about 2 million internet users in Indonesia. The number has since then increased to about 18 million users in 2007 recently, or 8.1% internet penetration rate. The low internet penetration rate in Indonesia is caused not only by the expensive bandwidth price, but also by the limited availability of computers.

Based on the data from *Asosiasi Pedagang Komputer Indonesia* or *Apkomindo* (Indonesian Association of Computer Retailers), the number of computers currently distributed in Indonesia was around 6.5 millions units (Bisnis Indonesia, 2006). Internet users in Indonesia are not distributed evenly.

They are highly concentrated in urban areas, such as provincial or major cities, very low in rural areas, and virtually none in remote villages. This correlates directly with the existence of tele-centres or internet/cyber cafés in the respective regions.

From 70,000 villages throughout the country, around 43,000 (62%) do not have telecommunication infrastructures, and 12,634 (18%) do not have tele-centre or internet connected centres. The distribution of internet users in Indonesia can be summarised in the following table.

**Table: 1**
**Number of population and residential location**

| Location | Number of population | |
|---|---|---|
| Residential location of the population | Rural: 119.40 million (58%) | Urban : 86.40 million (42%) |
| Around tele-centre or cyber café (potential user ) | 0.21 million (0.10%) | 18.60 million (9.04%) |
| Outside telecentre or cyber café | 119.20 millions (57.90%) | 67.80 million (32.96%) |

Data source: BPS/Statistics of Indonesia, 2000; USO/Universal Service Obligation data (Post and Telecommunication, 2003); Internet/cyber café (Association of Community Internet Centre 2003/2004)

By 2015, the Indonesian government plan to facilitate the development of 18,226 internet/cyber cafés in urban areas by private sector or *Asosiasi Pengusaha Warung Internet Koperasi Komunitas Telematika* or *APWKomitel* (Association of Internet Centre Entrepreneur –Indonesian Cooperative on Multipurpose Community Centre) and 55,534 telecentres in rural areas and villages. In 2007, the government through *Badan Perencanaan Pembangunan Nasional* or *BAPPENAS* (National Development Planning Agency) facilitated the development of 1000 tele-centres (Rusdiah, 2005).

Another barrier in the use of new technology in Indonesia relates to the proficiency in the use of English language, which is widely used in the world of information network is, but which is not used daily by most Indonesia population. To overcome this barrier, the use of Indonesian language in public service information needs to be expanded, as more people use computers in Indonesia.

Special effort needs to be done to develop Indonesian-based software, manuals, websites and search engines.
The following illustrates a case in the use of ICT in higher education. Since 2001, UT has used ICT for instructional, administrative activities and operational management activities. E-learning services have been developed to facilitate student learning in an electronic learning environment.

E-learning allows students to acquire information according to their individual needs, and enables students to study according to their individual time, location and pace of study. UT offers more than 900 courses with 35 study programs in four Faculties, namely the Faculty of Economics and Developmental Studies, the Faculty of Social and Political Sciences, the Faculty of Mathematics and Natural Sciences, and the Faculty of Teacher Training and Educational Sciences, plus a Graduate School.

Currently, UT provides online tutorials for 555 courses, more than half of all courses. UT online services enable students to obtain their web-based supplementary learning materials, view television programs by video-streaming, and monitor their own progress by looking at their examination grades.

Online tutorial is not mandatory, and it is intended to drive UT students to use computers and have access to the internet more frequently. The development of UT courses with online tutorial services can be seen in Figure 1.

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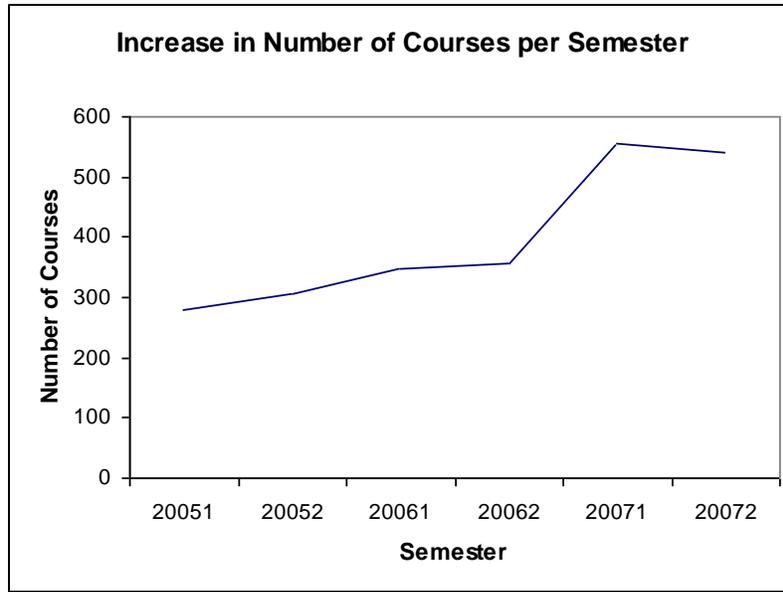
**Figure: 1**
**Increased number of courses supported by online tutorials**

A recent study indicated that only 3.5 to 4 percent of about 325,000 students utilized UT online facilities (Belawati, 2005). From that number, 40% of students accessed the facility using their office internet connections, 40% using cyber/internet cafés, and only a few using personal internet connections (Belawati, 2005). Although the number of students using online tutorial services was limited, there has been growing number of students' interests in using online tutorial services, as can be seen from the following data.
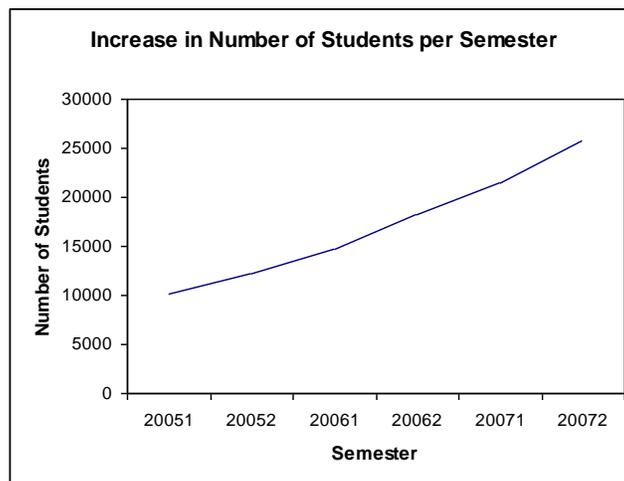


**Figure: 2**
**UT student number trends in using online tutorial services by semester**

UT has attempted to facilitate students' access to ICT facilities by making available more computer units from in its 37 Regional Offices throughout Indonesia as part of the effort to socialize e-learning in the students' learning environment and educate the students to become more ICT literate. This is important to help improve student participation in the use of new technology. The number of students using online tutorial services has increased in all faculties within the UT, as indicated in Figure: 3.
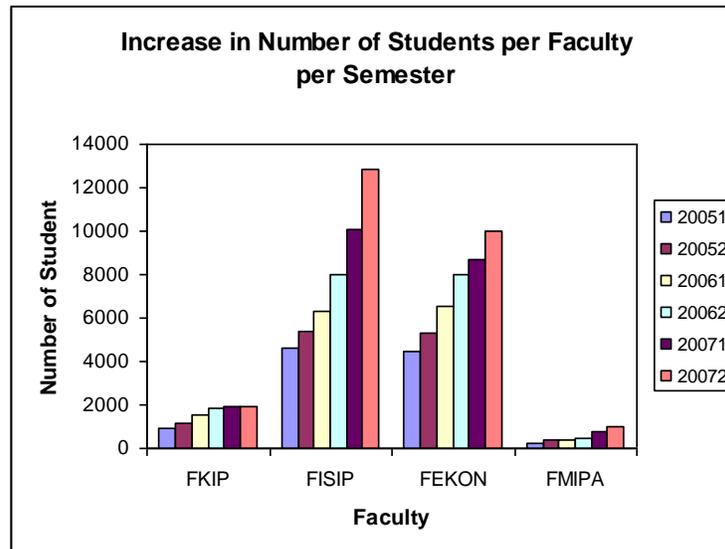


**Figure: 3**
**Increasing trends of student numbers by faculty per semester**
Notes:
FKIP = Faculty of Teacher Training and Educational Science
FISIP = Faculty of Social and Political Sciences
FEKON = Faculty of Economics
FMIPA = Faculty of Mathematics and Natural Sciences

The use of computer network is not only limited to the communication between tutors and students, but it can also be extended to a wider communication spectrum. UT has been connected with *Jaringan Pendidikan Nasional* or *Jardiknas* (National Education Network) which has been developed by the Department of National Education. This network consists of network of schools, educational offices, students and teachers, and higher education institutions nationwide.

The information technology and communication network connecting Indonesian tertiary education institutions is called INHERENT (Indonesian Higher Education Network). It has been developed by the Directorate General of Higher Education since 2006, and is designed to connect all Indonesian higher education institutions nationwide.

The first stage of its network infrastructure development has been executed to cover 33 nodes from almost all of provincial capitals in Indonesia. UT is one of the 33 nodes included in the INHERENT system.

Through INHERENT, tertiary students around Indonesia can be involved in accessing information through technology-based electronic discussion forums and conferences. The computer network technology allows for the possibility of developing human resources without time and location constraints. Through the *Jardiknas*, UT can reach out to schools across rural regions that have difficulties in obtaining public internet accesses. When the computer network of various Indonesian universities is extended to connect with the network of primary and secondary schools, students can interact not only with their teachers, but also with tertiary students and university lectures. As the result, their awareness knowledge seeking and construction can develop more widely and openly. Students will have a better understanding why they have to study various subjects, such as why physics and mathematics are important for those to pursue career as computer scientists or electronics engineers. This situation will increase students' interests in various fields of the sciences.

Furthermore, UT also promotes the effort in improving the public internet access and collaborates with internet service providers such as *Asosiasi Penyedia Jasa Internet Indonesia* or *APJII* (Indonesian Association of Internet Access Providers), *Warung Informasi dan Teknologi* or *Warintek* (Information and Technology Café) and *Warung Internet* or *Warnet* (Internet Centre/Internet Café) in order to facilitate access by its students to the internet. The existence of an integrated computer network in Indonesia across primary, secondary and tertiary educational institutions should become the foundation of information revolution that can lead to the establishment of a knowledge-based Indonesian society.

The number of students participating in online learning at UT has increased continuously from semester to semester, despite the fact there are some limitations and constraints in terms of access to online learning services by distance students. From the students' points of views, some of these constraints need further improvement by the institution. For example, some students are prevented from access due to poor connection. Other students can access internet but they have difficulties in downloading the requested materials, or there are difficulties in uploading materials as requested to respond to online assignments. From the tutors' points of views of tutors, improvements on the online tutorial services also need to be done. Some tutors sometimes have difficulties in using the online tutorial facilities effectively. Tutors are required to respond to respond to students' queries individually, and this poses problems for some courses with a large number of students participating in online tutorials.

Generally speaking, however, there have been increasing trends in the use of information and communication technology in teaching and learning at a distance, particularly at UT in terms of the number of courses with online tutorial services and the number of students signing up in online tutorial courses. This is an important momentum to kick start continual improvement effort of distance learning programs and courses and the use of information and communication technology. In order to improve the quality of online tutorial services, a number of initiatives can be done, such as through socialisation and training in online tutorials during new student orientation, the training of online tutors, and continuous monitoring and evaluation to improve the online tutorial services.

## CONCLUSIONS

UT is an example of best practice in the implementation of the right to higher education. Distance education serves as catalyst in improving equity and equality of opportunity in higher education Indonesia, despite the challenge of low ICT literacy rate among students. Distance education can assist in improving the ICT literacy rate through training and socialisation. Investment in ICT will have constructive effect on the development of distance education in Indonesia and improve equity and access to higher education. Considering the fact that many of the distance higher education students are in-service primary school teachers, introducing ICT to this group of students will have long-term educational effects apart from its immediate effects on their distance learning processes. These student teachers will become ICT literate, and they will share these new skills to their students at schools.

Increased uses of ICT in teaching and learning at a distance will encourage initiatives in using the web or search engine based on *Bahasa* Indonesia, the national language which is not widely used as scientific or ICT language. Improved access to web-based information accessible by students and the society will have further effects on establishing the knowledge-based society of Indonesia. Supported by strong legal foundations, proper pedagogical approaches and suitable technology, distance education system should enable effective implementation of lifelong learning and enhance the implementation of the right to education. Distance education has key roles in reaching out the disadvantaged groups through the provision of quality education, and it serves as the catalyst in the establishment of a knowledge-based society.

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