

IT and education, the case study of e-learning in Indonesia.

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Keywords : Indonesia education
 e-learning culture
 Information technology

Abstract

E-learning in Indonesia began in mid-nineties with the advent of internet preceded by information technology introduction to Indonesia in late 70s and early 80s. However, those e-learning initiators hit hard by the economic and political crises which hit Indonesia in 1997s until early 21st century. Beginning the year 2000, many organizations took the initiatives to conduct e-learning in their environments, in spite of the economic crises. Based on a survey towards about 60 e-learning sites, the author found some constraints. First, the infrastructure which does not support the learning. Out of 223 million people., only 20 million own fixed telephone facilities, a must-prerequisite to access remote e-learning facilities. Using the cellular phones for internet connection is out of question as it is very expensive; on the other hand the Internet subscriber in Indonesia is limited. In 2004 there are 1,3 million internet subscribers with 14 million users. Second, on content management. Although the majority of e-learning operators are higher education institutions, there is no standard in the contents. While the contents are aimed to university students, the contents are not always reaching the academic intellectual standards. Third, there is no coordination in conducting the e-learning. The pre- and post Soeharto presidency (1998) marked the paradigm from centralized to decentralized university administration. The Directorate General of Higher Education (DGHE) which was once the regulator now is the facilitator on higher education affairs. The results is not a chaos, but an uncoordinated efforts toward e-learning. In certain universities, each department established its own e-learning facilities without bothering other departments' efforts, let alone at the at the national level. Fourth, the cultural factors. Indonesian in general prefer talking over writing, the result of oral tradition legacy, prefer attending the lecture over self-study. Hence Indonesian students prefer to communicate or interact directly with other students and or lecturer than to communicate in a virtual way as commonly found in e-learning. What needed by Indonesia are the better coordination among e-learning operators, the grand strategy of e-learning as dictated by the higher level of decision makers and making e-learning not as e-learning itself, but as a tool to equip students to stay up to date, information technology literate and to be competitive, in a flexible way.

Introduction

Indonesia is the largest archipelago nation in the world with more than 17,000 islands, more than 416 local languages with Bahasa Indonesia as *lingua franca* and various ethnics. Such conditions posed difficulties for decision makers in making nation-wide- decisions, including in the field of education as witnessed by various educational policy such as state final exams (still controversial), school attendance, etc.

Distant ~, open~, and e-learning

The term distant learning is almost synonymous with electronic learning (hereafter called e-learning) in term of education, albeit there is a difference. Distant learning or distance education have been applied interchangeably to the separation of teacher and learners in space and or time. As new technologies developed, distance learning or distance instruction was delivered through such media as audiotape, videotape, radio and television broadcasting and satellite broadcasting. Today microcomputer, the Internet and the World Wide Web are shaping the current generation of distance learning. Hence the term e-learning which is generally used to refer to the use of technology in learning in a much broader sense than the computer-based-learning or computer-aided-instruction in the 1980s. E-learning is naturally suited to distance learning and flexible learning, but also can be used with face-face teaching.

Based on various interviews, the concept of e-learning in Indonesia has been proposed as far as early 1990s, however, economic and political crises that hit Indonesia in mid 1990's forced the postponement of e-learning. Based on the existing documents and various interviews, the e-learning began in Indonesia around early 2000s, after the decreasing impact of the crises.

Early distance learning institutions

The earliest distance learning in Indonesia began in the 1950s, known as correspondence courses, usually oriented to teachers geared to obtain the required degrees. Subsequently, it was replaced by the opening of Universitas Terbuka (Indonesian Open University, hereafter is called UT) in 1984. For more than a decade, the government through Directorate General of Higher Education (hereafter called DGHE) only recognised the UT as the only distance learning at tertiary education. A proposed distance learning by private institution was simply rejected by the DGHE in early 1990s because it was contrary to the existing regulations (Payong 2001).

By 2001 the DGHE announces a new regulation for higher education system, regarding the distance education mode. The new regulation allows conventional universities to offer some of their programmes in the teaching and learning activities, conventional and distance learning. However, the new regulation also stated clearly that only the information communication and technology (ICT)-based distance education is allowed to obtain review and evaluation for approval.

The new law on national education system (Indonesia, 2003) stated that open and distance learning is one of educational systems employed in Indonesia. It is a new

approach as the ICT-based open and distance learning is seen to be able to provide answers to access and equity problems in education.

The existing institutions

No documentation exists when was e-learning officially began in Indonesia because the e-launching programmes was conducted sporadically, even in the same institutions. Based on various interviews, the e-learning efforts have been proposed as early as 1995, however, the economic and political crises that struck Indonesia in 1997 compelled the e-learning efforts suspended involuntarily until early 2000s (Soekartawi, 2003).

The largest open and distance learning university is naturally the UT, followed by various universities and even some senior high schools. The e-learning efforts began sporadically, even in the same institution. It was that in Universitas Indonesia the e-learning efforts began sporadically and separately in three different department i.e. in internal medicine, international relations and computer science. By early 2004, Universitas Indonesia launched Student-Centered e-learning Environment (SCELE) operated by Faculty of Computer Science, albeit still supported by printed textbook and also face-to-face meeting on campus (Hasibuan 2005, Hasibuan 2006, Hasibuan and Santoso 2005)). Institut Teknologi Bandung (Bandung Institute of Technology, hereafter called ITB) initiated the establishment of School On the Internet in Asia (SOI Asia) focuses on course exchange via the use of internet and teleconferencing.

Universitas Gadjah Mada in Yogyakarta (hereafter called UGM) focused on small scale development by Faculty of Engineering. The e-learning is designed to use the problem based learning as virtual instructional strategy. The content development consists of development underlying theories and concepts, exercises and practices and external resources (linkages) for each course in engineering. Some consideration underlying the development of content, i.e. emphasis on effective transfer of information (current and updated contents, minimal distractions), requirement of minimum learning effort ((user friendly), the use of multimedia format, and also the use of low bandwidth connection(Pannen 2006), There is a plan to expand the programme into small and medium scale.

Universitas Islam Sultan Agung in Semarang, Central Java, emphasized the development of Sinau Online, e e-learning management system. The initiative is designed to be focusing on open learning, i.e. learning through multiple channels and media to enhance face-to-face learning. There are around 40 courses available online at Sinau Online by early 2006, and the Sinau Online has been on its second version of its development.

Universitas Padjadjaran (hereafter called UNPAD) in Bandung, West Java employs a blended learning environment where the face-to-face classroom learning activities are blended with the learning technology. For its e-learning initiative, UNPAD select Web-based – technology and employs it fully as its learning management system.

Universitas Bina Nusantara and Universitas Pelita Harapan, both in Jakarta, has been utilised the e-Web-based e-learning programmes for years. E-learning was known has been practiced in other universities, albeit sporadically in term that e-learning was initiated by one or more lecturers without any collaboration with other department. For example even in Universitas Indonesia, with its SCELE programme, the e-learning was conducted at least at three different departments.

Apart from the above mentioned institutions, there are many universities who are making efforts to develop e-learning courses scattered in many provinces such as Papua in the east (Universitas Cenderawasih), Gorontalo in the northern part of Sulawesi (Gorontalo Teachers College), Southern Sulawesi (Universitas Hasanudin) Bali (Universitas Udayana,), however the majority are in the island of Java.

Apart from higher education, e-learning also were utilised in some senior high schools in Jakarta and Surabaya, the majority are the national school with international standards and internationally franchised-operated-high-schools. In the province of West Sumatera, some municipalities operated *Jaringan Informasi Pendidikan* (Education Information Network) to serve e-learning for schools, from Primary to Senior High Schools.

Software being used

As the e-learning efforts began sporadically among various departments and institutions then there are different software used by different persons. Those are:

1. **Modular Object Oriented Dynamic Learning Environment** or commonly abbreviated **Moodle** are used in many universities various cities (Moodle sites2006). such as Jakarta (Universitas Tarumanegara), Bandung (Institute Teknologi Bandung, Universitas Padjadjaran,), Bogor in West Java (Institut Pertanian Bogor or Bogor Agricultural University), Semarang in the province Central Java (Universitas Negeri Semarang), Surabaya in the province of East Java (Universitas Surabaya)Jayapura in West Irian (Universitas Cenderawasih),
2. **SCELE** or Student Centered E-Learning Environment are developed by Faculty of Computer Science Universitas Indonesia (Hasibuan 2005, 2006)), even conducted a questionnaires to evaluate its effectiveness. The result showed that the use of e-learning system can shortened the student learning curve.
3. **Galilee**, web based distance learning developed by Universitas Kristen Petra in Surabaya, East Java This system has been developed based on Active Server Pages (ASP) technology from Microsoft which is embedded in a web server. Web pages residen in a web server which is connected to an SQL Database Server. This web-based collaborative learning system gives the students more active role in the information gathering and learning process, making the distance students feel part of a learning community, therefore increasing motivation, comprehension and interaction with other students(Budiman & Resmana, 1999).
4. Microsoft E-Learning Library (MELL) used by private companies.
5. In-house programmes developed by various institutions and persons. Although some succeeded in their e-learning programmes, almost all are limited to specific institutions, inaccessible for outsiders and some are incompatible in characteristics with the others.

Efforts toward e-learning competencies.

DGHE conducted some courses for e-learning especially for lecturers, the latest is the INHERENT or Indonesian HighER Education NeTworks. These infrastructures are one of many ones developed by DGHE, the others like satellite-broadcasted-distance-learning-agricultural courses operated by Bogor Agricultural University and those operated by Universitas Hasanudin in Makasar, South Sulawesi for satellite-assisted-distance-learning-courses specially designed for eastern Indonesia region.

Department of National Education operated the Jaringan Sistem Pendidikan Nasional (National Education System Network) a multi-purposes networks with some activities geared toward e-learning. Center for Communication Technology for Education and Culture operated the system. Ratna (2003) reported on distance e-learning using Jarkom-Online evaluation system, made by using PHP and HTML language and also by MySQL database to store the data. The analysis showed that the system has the reliability on its ability to create independency between student and lecturer, personalized quiz, reusable questions, transparanecy and fair quiz.

Southeast Asian Ministers of Education Organization Regional Open Learning Centre (hereafter called SEAMOLEC) is known as the most active institution to promote e-learning as reported in its annual report (SEAMOLEC 2006) as well as those reported by Lukman (2004). SEAMOLEC also conducted workshop on e-learning-related-activities at Universitas Lampung in Lampung, South Sumatera (Rakhmayani, 2004), Universitas Warmadewa in Denpasar, Bali (Lukman, 2002),Bogor Agricultural University in Bogor, West Java (Siswosumarto 2003).

On September 2005, a group of professionals from different background and institutions established E-learning Community whose programmes including publish an e-journal and newsletter, run seminars and training programmes about e-learning. Alas, not so many activities have been launched since its establishment.

Some myths

Although e-learning required the availability of hardware, software, network, ICT literacy, the effort to fulfil institutional preconditions and changing the learning process are still influenced by some myths commonly found among the community in Indonesia. Such myths could wrongly perceived the ICT application or on the contrary to oversimplify the situation. Some of the myths are as follows:

(a) *Conventional lecture can be transformed directly into e-learning through the digitalisation process.*

Face-to-face learning is the bases for e-learning, however the conventional learning is not automatically become an e-learning stuff after digitalisation. In order to become a e-learning stuff, the conventional lecture should be adapted selectively to convert it into an e-learning material, including the interaction method and relationship among the learning materials.

(b) *E-learning cause the student's isolation.*

Some questioned the influence of e-learning as it caused the isolation because the student study alone in his or her room, does not interact with others and could cause boring and lonely. Such myth not correct as experiences showed that the higher the

utilisation of latest technology, the higher the social interaction to be as long as the e-learning designer designed a creative e-learning accommodating virtual social interaction. This virtual social interaction is embedded in the material as a required assignment and enables the student to correct whether his or her opinion is different or from the others, supported or appreciated by the source person or other students. Hence its is important that the designing of social interaction and group discussion is a must for e-learning development.

(c) E-learning required the ICT mastery from the lecturers and students.

This myth originated from the perception that ICT mastery is above everything because e-learning focussed on ICT. Actually more important than e-learning focus are the establishment of the students' learning process. E-learning is using ICT but e-learning is not learning technology but utilising technology for the sake of learning.

What are needed for e-learning is the ICT basic competencies such as using keyboard, surfing in Internet, log-in, checking, making and response posting and e-mail. For the lecturers they need selective adaptation, designing creative learning process and evaluating the students' works.

(d) The lecturer is expert in his or her field.

Lecturers are expert in his or her field is un-debatable. However, he or she must combine his or her expertise with e-pedagogy supported by the always emerging new technology. With such condition then the lecturers must work closely with experts from other fields such as from e-pedagogy, ICT and even with e-learning users, hence its is a team approach.

(e) E-learning is for everybody.

E-learning possessed some advantages such as enabling the students to arrange their own time to study, greater access than the traditional course, could work and study without leaving the job. However, e-learning's flexibilities can cause the student becoming lazy as they can postpone the study without any control from anybody. With such conditions, e-learning needs procedure to keep up the students' motivation to learn, to control the learning progress and evaluate his or her output. With such conditions then e-learning system required the integration of various factors.

(f) E-learning needs sophisticated and expensive equipment.

Computers and Internet networks are really needed for e-learning, but it does not mean that everybody should possess his or her own computers. What really needed are the access to those facilities which yielded the digital divide in Indonesia. Although the Internet dispersion in Indonesia is almost evenly distributed, thanks to the Post Office services, still for the majority access to Internet is limited.

Some constraints

In general, the e-learning activities faced constraints as follows:

(a) Language constraints. The language does play a role. While ICT 's instruction, manuals, standards are dominated by English language, then the language are not

mastered by the students. Although English is the first foreign language taught at the Junior High School and Senior High School and even one or two semester at the tertiary level, (now even in Primary Schools thank to reformation and local curriculum policy). the English mastery is not quite satisfactory. Almost all university textbooks are written in English which are not always mastered by Indonesian students. One example of insufficient English language mastery is the entrance requirement at the graduate programme for English language is TOEFL 450, hardly enough to read English text, let alone for undergraduate programme. On the other hand, not so many textbooks are written in Bahasa Indonesia owing to various reasons such as the inability of the lecturers to write in good Bahasa Indonesia, low income, small stipend from books writing (Rahardjo 2002)

(b) The impartiality of the Internet dispersion.

The e-learning, especially Web-based learning could not be separated from the Internet. Although Internet has been known since 1990, it began its operation in Indonesia around 1992. Some papers related the students revolution which toppled the President Soeharto in 1998 although many doubted it. The Internet users began in 1998 and every year showed its increasing users (Table 1)

Tabel 1 Internet users in Indonesia

Year	Subscribers	Users
1998	134.000	512.000
1999	256.000	1.000.000
2000	400.000	1.900.000
2001	581.000	4.200.000
2002	667.000	4.500.000
2003	665.706	8.080.000
2004	1.087.428	11.226.143
2005	1.500.000	16.000.000

Sources : Data statistik APJII 2004
<http://www.apjii.or.id>, 3 Desember 2006

(c) The infrastructure problem.

Although Internet can be included in the infrastructure, the infrastructure in term of telecommunication network, Internet is a by-product. The existing infrastructure in Indonesia does not always support the e-learning programme. There are only two-government-provided-networks, i.e. those developed by Department of National Education through Sistem Jaringan Pendidikan Nasional (National Education Network System) operated by Center for Educational Communication while the other is INHERENT operated by DGHE. INHERENT just began its operation in the year 2006 based on the finding that the infrastructure measurements are lower than some countries. A local-based-distance-learning system developed by some Provincial Education Office

such as Jaringan Informasi Pendidikan (Education Information Networks) developed by a municipality in West Sumatera province.

Table 2 Infrastructure and HRD measurement

Country	Infrastructure measurement					HRD capital measurement	
	PC/100	Internet host/10,000	% Pop online	Telp/100	Cellular phone/100	Human Dev. Index	Info. Access Index
Australia	46.62	843.52	52.5	52.41	44.63	0.936	0.999
Indonesia	0.99	1.26	1.2	3.14	1.73	0.677	0.583
Malaysia	9.45	29.13	17.0	19.93	21.32	0.774	0.333
Singapore	48.31	437.56	49.3	48.45	68.38	0.876	0.333

Source: Iljas (2006)

Based on the above mentioned statistic, the DGHE then established the INHERENT with the objectives the service integration between universities, connection to external networks and advanced networks features. The INHERENT connected 33 local nodes which are the backbones, and 26 sub-locals of the state universities and 26 sub-local from various private universities, all are financed by the DGHE. Although it is a promising infrastructure, there are some sceptics who pointed out that after the project and financial support are over, latter on the project is abandoned. One example was the development of satellite –based-communication linked some state universities in Mid Java in mid 1980s. Although it was developed to connect various universities for various reasons, lately it was abandoned because of under-utilized. Another example was the project concerning the infrastructure for university libraries in 1990 which covered HRD development, ICT provision including library automation, book and journal provisions but were abandoned by the state universities after the project ended by 1997 (Sulistyo, 2003).

(d) Course content management.

Writing textbooks for e-learning is more difficult than printed, used for-face-to-face learning because it required some additional skills such as the making questions for students, plus additional ICT-related items such as e-mail, log in, and so on. Some courses are more complicated to teach through e-learning than face-to-face learning such as courses on language which emphasis on spelling and pronunciation (found among others at Universitas Katolik Atma Jaya in Jakarta), detail pictures of human body (found at School of Medicine Universitas Indonesia), intricate architectural pictures and drawings (found in Architecture courses at Universitas Katolik Atma Jaya in Bandung and Universitas Katolik Parahyangan in Bandung, West Java). Few departments included Power Point presentation in its e-learning materials whilst such presentation is considered the earliest part of e-learning or can be considered not an e-learning material. Pannen and Abubakar (2005) reported some concerns during the design process such as the instructional designers did not have enough knowledge on the learning management system (LMS) while the computer technicians did not have knowledge on systematic instruction and learning, the lecturers did not have the skill to “draw” using computer while finding the right images were not easy and some technical concerns.

(e) Resistance from the users.

ICT- literacy among the lecturer. The ICT literacy, not the ICT mastery, is a must for e-learning, because such competency enables the lecturer to search online, multimedia conferencing. Although the ICT literacy for e-learning required the lecturers' competency to log-in, inspecting and making posting, opening and answering e-mail, those items are still alien for some lecturers. Even until mid 2006, many deans compelled the lecturer to submit his or her e-mail address.! Another more important aspect is the ICT utilization as a supporting means for e-learning.

(f) Cultural problems.

Indonesians prefer talking over writing, prefer attending training conducted by instructors than self study as required by e-learning . E-learning platforms still limited direct communication with other people. For training, e-learning demands good discipline. This means that the trainees should be able to sit throughout the course to be able to learn something without anyone supervising, which is still uncommon in Indonesia (Sudiono 2002).

(g) The sporadic development of the e-learning in the campuses yielded various e-learning systems and its incompatibility with the others. These situation happened because some universities system is not yet ready for implementation of web-based courses: problems of connectivity, access, hardware, software and facilitators. These are commonly found in state and private universities, hence some lecturers initiated the e-learning programmes without bothering the others and hence the incompatibility of the system. When the chancellors decided to initiate the e-learning then there are some systems that has been born out of the lecturers' initiatives, each in its own system hence its incompatibility. When the matters are discussed at the national level, then the universities 's parochialism emerged.

The current research works

Actually no one know who and what research are conducted on e-learning in Indonesia; even the Department of National Education and Ministry of Research and Technology have no data, let alone the other sides. However, some researches are known to be conducted at various universities, albeit, the information is not evenly distributed. For example in Universitas Indonesia some works toward e-learning are conducted by various departments with almost no coordination at the university level, let alone at the national level!

Lessons learned

E-learning began sporadically in various institutions, thanks to the initiators. However, when the works emerged campus-wide then it is obvious that the universities and even the nation-wide-level needs better coordination and national policy, supposedly supported by the relevant government institutions such as the Department of National Education, Ministry of Research and Technology, Ministry of Communication and Informatics and so on. Alas, the co-ordination is a very rare matter in Indonesia so it is naturally that some scholars are worried that e-learning activities move in their own

paths. So what is really needed is better co-operation among e-learning-organizer-institutions and the government-decreed-national policy from highest level.

The e-learning programme countered various factors such as the infrastructure, language problems, lecturers' attitude toward ICT, the dominant oral society with less emphasize on reading, the dominant sectarian ego etc. With huge areas, the disparity among various regions in Indonesia unavoidable with the huge impact to education including e-learning. These constraints still supported by the negative attitude toward ICT, the strong insistence on traditional learning and lack of English language mastery, a language commonly used for e-learning. With the limited infrastructure, e-learning is limited to those who have access to ICT, creating unwanted digital divide in the nation although the government launched projects to overcome such obstacles.

E-learning is not only Web-based-distance learning added with digital services, but based on online knowledge management also strengthened via the participation and interaction with students. E-learning takes advantage of the resources and experts available on the Net and provides students access to them, creating interactive methodologies to work in a network with other peers in a virtual space. Sharing the knowledge of the group beyond the individual participants' time zones or geographic locations (Garcia 2006)

A "tragic" matter happened in some courses, among others in Library and Information Science. For decades the students know better the library conditions in advanced countries such as US, UK, West Europe and Australia, but they have no better ideas and description on the library matters in Southeast Asia regions or Korea or even Japan. A proposed comparative librarianship monographs has been adopted by Conference of Southeast Asia Nations in Manila, Philippines, April 2006 respectively. The idea is introducing better information and understanding about librarianship in CONSAL member countries so that the students and latter on librarians know better about their neighbourhood. This project can be developed into e-learning course so that it participate in developing better understanding among Southeast Asian students and other s about the area, the problem, the efforts and common understanding for all.

For other courses, special attention should be aimed at teaching of vernacular languages albeit much neglected in favour of modern international language such as English. This idea is mainly for non-English speaking nations in Southeast Asia regions such as Indonesia. Culturally the vernacular is deserted even by its own speakers. Utilising e-learning, it is hoped that the vernacular language, especially those spoken by the Javanese with more than 70 million native speakers, teaching furthered better, gain much audience and wider acceptance. The vernacular languages in Indonesia have its own specific pronunciation, as also English and other international languages, a difficult but does not mean unsurpassable matter. So did with other intricate course for example history of architecture, archaeology or anatomy.

In term of Southeast Asia and Asia such as Korea, a formal collaboration for e-learning executor coordinated by SEAMOLEC and other institutions could coordinate and support the e-learning activities through face-to-face virtual meeting, either in the subject or wider disciplines, added with exchange of ideas and widened the sphere not only limited to ICT people but also the others.

Conclusions

In Indonesia, e-learning programme began in mid 1990s but its pace getting faster by early 2000s. Early efforts marked by individual lecturers who developed the e-learning according to their capabilities, needs, and available resources. Hence when the universities raised its status to be a university programmes then some frictions happened, as it happened at national level. With that conditions then it is necessary to establish a nationwide-e-learning policy involving various higher education institutions, private sectors, and government agencies. The coordinated works then able to overcome various constraints such as infrastructure, language problems, content quality, resistance from the ICT-awkward-persons in order to reach the stated goals, either institutional or education ones.

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