Design and Implementation of a Process Model for Multinational E-learning in Higher Education:

- A Case Study of the ASEAN Cyber University Establishment Project -

高等教育における多国間eラーニングのための
プロセス ・モデルの設計と実行に関する研究
－アセアン・サイバー大学設立プロジェクトの事例研究－

A Dissertation Presented to
the Division of Education
the Graduate School of International Christian University
for the Degree of Doctor of Philosophy

国際基督教大学　大学院
教育学研究科提出博士論文

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May 2, 2013
2013年5月2日

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Chapter 1: Introduction

In this chapter, the research background of the present thesis is expounded along with the explanation of why this study is needed. Purposes and significance of the thesis are also discussed.

Research background

ICT and e-learning expansion

The advancement of information and communication technology (hereinafter referred to as ICT) has a great impact on every aspect of human life (NIA[1], 2011). ICT implies a tool and process to access, search, save, manipulate, create, offer or exchange information using electronic or automatic devices (UNESCO, 2003, p75; KERIS, 2009, p9). People use ICT for shopping, sending packages, finding dates, doing business and attending classes. And on the web, they find good recipes or famous restaurants from reading others' comments. An increasing number of people are creating their own digital contents to share them on a website such as 'YouTube'. At times, they ignite a cultural movement like the Korean wave, 'Hallyu[2]'. Just like everything else, such cultural exchanges and popularity result in helping a nation raise its national competitiveness in the global economy. As of 2012, the economic value of Hallyu reached $53.68 million while creating 51,545 jobs, a number which is 15,888 more than that of the previous year (KOFICE[3], 2012). With the use of electronic mail, video conferencing and mobile communication, one can now transcend time and space to communicate and make swift decisions, which in turn has become the catalyst of social change. By adding Internet accessibility, the mobile devices have become much more portable and interactive than the mass media. As they are known to overcome time and space, they are at the core of globalization (NIA, 2011).

[1] NIA (National Information Society Agency): Statutory agency founded by Article 10 of the Framework Act on Informatization Promotion for the purpose of promoting informatization and supporting the development of policies of national agencies and local autonomies (http://www.nia.or.kr)

[2] Hallyu: The Korean Wave(*Hallyu*) is a neologism which describes the growth in the popularity of South Korean culture since the late 1990s. from http://en.wikipedia.org/wiki/Korean_Wave

[3] KOFICE (Korea Foundation for International Culture Exchange): A non-profit organization established for the purpose of promoting the Korean cultural contents all over the world (http://english.kofice.or.kr/)

ICT is also bringing changes in education as teaching aids in the classroom, or as in the form of e-learning. E-learning is a type of learning methodologies through ICT (KERIS, 2012). For example, graphic software and global positional system (GPS) are used in a geography class, and through iEARN, which is a network for international educational resources, and ePals, which is the largest online student community in the world, learners can utilize and share the knowledge that they have acquired in the classroom with one another. In higher education, open educational resources (OER) provided by many prestigious universities in the world for free are being widely used. The MIT-x is one of the free online lecture programs focused on interactive communication between instructors and learners. The edX is another example of this kind, which is offered by Harvard University and MIT to everyone in the world for free. E-learning does not only set the stage for a new educational era but also demolished the boundaries to access knowledge (Ali, 2004; Michael, 2000; Lankshear, 1997; Peraya, and Rikenmann, 1998)

Education, a key factor for national development

The Republic of Korea, which has achieved miraculous national development through education over a short period of time despite limited natural resources and terrible vestiges of the Korean War, is now one of the most well-connected and technologically advanced countries. The success of Korea's national development has been admired and emulated by many developing countries. In Korea, more than 80% of high school graduates go to university (MEST, 2011) and most Koreans tend to continue studying for the rest of their lives. In order to meet the diverse needs in higher education, twenty one (21) cyber universities have been established over the years, offering educational programs in more than two hundred forty (240) major fields (KAOCE, 2011). And they can grant bachelor's degrees as higher education institutes. It is a well-known fact that Korea's education fever helped make a remarkable economic development and growth, and overcome a lack of natural resources and the hunger and poverty left by the Korean War.

The success story of Korea sets an example for other developing countries. The Korean Ministry of Strategy and Finance has been passing on the know-how of the Korea's successful economic development in about two hundred (200) areas to twenty (20) developing countries including Uzbekistan, Kuwait and Vietnam through the Korean official development assistance model called Knowledge Sharing Program (KSP), which is also known as KSP (KDI, 2012). As a result, the importance of education for human

resource development and national development at large was strongly stressed at the ASEAN+3 foreign ministers' meeting on October 29th, 2010 and the East Asia Summit (EAS[4]) on October 30th, 2010. And moreover, the promotion of educational cooperation was included in the Hanoi declaration, which was adopted to commemorate the 5th anniversary of East Asia Summit. So the ASEAN secretariat and the secretariat of Southeast Asian ministers of education (SEAMEO)[5] along with other educational organizations and affiliated institutions like ASEAN University Network (AUN)[6] sought concrete ways to enhance the cooperation (KEDI, 2010). As the ROK-ASEAN[7] relations improved with 'Full Dialogue Partnership', they are expanding their cooperation in various fields (KEDI, 2011). The Korean Official Development Assistance (ODA[8]) for ASEAN has been increasing each year (Table 1.1).

Table 1.1 *ASEAN ODA Recipient by Type of Aid, 2010*

(US $ Million)

Donor	World					Korea				
Type of Aid / Recipient	ODA Total	Grants	Loans	Commit-ments	Multi-lateral	ODA Total	Grants	Loans	Commit-ments	Multi-lateral
ASEAN	10,780.7	4,835.0	5,945.7	10,744.3	2,141.0	234.7	113.5	121.3	620.4	23.5
Brunei	-	-	-	-	-	-	-	-	-	-
Cambodia	768.0	636.7	131.4	1,032.8	210.2	37.3	19.1	18.2	76.1	2.2
Indonesia	3,525.8	1,370.5	2,155.2	2,912.3	421.3	28.2	19.0	9.1	158.4	4.3
Lao PDR	474.6	389.0	85.6	554.7	129.5	27.8	13.7	14.1	17.4	1.9
Malaysia	210.7	98.4	112.3	95.9	27.4	1.7	1.7	-	1.7	0.2
Myanmar	399.2	393.0	6.2	370.4	142.2	5.5	5.5	-	6.5	0.4
Philippines	1,467.3	636.6	830.7	1,282.2	150.5	19.6	19.6	11.0	65.2	0.3
Singapore	-	-	-	-	-	-	-	-	-	-
Thailand	441.5	281.4	160.1	570.8	112.3	2.5	2.5	-	2.5	0.4
Viet Nam	3,493.6	1,029.3	2,464.3	3,925.3	947.7	101.2	32.5	68.8	292.6	14.0
China	2,644.7	1,417.2	1,227.6	2,393.1	330.3	5.8	5.8	-	6.9	0.9

Source: OECD Stat. (OECD), K-ASEAN Statistics 2012, p38

[4] EAS: ASEAN 10 countries (Republic of Korea, China, Japan, Australia, New Zealand, India, U.S.A, Russia)
[5] Southeast Asian Ministers of Education Organization: SEAMEO
[6] ASEAN University Network: University network in the ASEAN region
[7] ASEAN: Association of South East Asian Nations (Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, Vietnam)
[8] OECD Development Assistance Committee: DAC defines official development assistance when the resource, which flows from a donor country, meets the following requirements. 1) It is offered to either international organizations or developing countries listed in the DAC list of ODA recipients, 2) it is for the economic development and welfare promotion of developing countries, 3) it should not impose financial burden on the developing countries, and the grant element of a loan should be at least 25% on concessional terms after a10% discount.

Among the fields of cooperation, the educational exchange between ROK and ASEAN member countries in particular has been increasing. The number of students from ASEAN countries and studying in ROK is continuously increasing every year (Table 1.2).

Table 1.2 *Trend in Number of Students from ASEAN Studying in Korea*

(Persons)

Country	1990	1995	2000	2005	2008	2009	2010	2011
ASEAN	79	164	443	1,221	4,688	4,967	5,748	6,135
Brunei	-	-	-	11	3	6	10	15
Cambodia	-	-	5	41	126	153	265	310
Indonesia	7	10	32	94	355	401	527	663
Lao PDR	-	-	0	16	43	50	85	95
Malaysia	65	115	51	241	529	555	609	592
Myanmar	2	6	66	81	169	194	229	262
Philippines	2	7	126	78	360	419	482	549
Singapore	1	2	2	5	44	67	136	172
Thailand	2	5	39	48	223	283	400	406
Viet Nam	0	19	122	616	2,836	2,839	3,005	3,071

Source: K-ASEAN Statistics, 2012, p121

The importance of e-learning is often perceived as a means to enhance national development and international cooperation. Especially, in the case of developing countries that lack capital, manpower and experience, e-learning is recognized as a means of creating the high-performance and low-cost education system. Most countries want to offer their citizens various educational opportunities. However due to the limited budget for education (education in general is often supported by the public fund), a high-performance and low-cost educational model has been sought (Daniel, 2012). Since there is a lack of human resources and national budget for education, opportunities to access to higher education are not enough to learners in the developing world, the mobility of human resources is restricted under the labor laws on the pretext of protecting their workforce in many of the developing countries (Cho, 2005). E-learning is implemented with many web-based learning resources offered for free to anyone with the Internet connection; it is recognized not only as a cost-effective means of providing but also a communication method beyond

the limitations of time and space in (ENQA[9], 2013). For these reasons, e-learning would be much more practical than offline education which is a traditional means of providing classroom education. E-learning can also be a solution to these issues by introducing the educational know-how of the developed world and training their human resources (UNESCO, 2012a) without having to send them abroad.

Need for a process model to establish a multinational e-learning system tailored to developing countries

A process model, which can formulate, collect, mediate and reflect various opinions of stakeholders on the final product, has been adopted in the establishment of a multinational e-learning system which is applied to the ASEAN cyber university establishment project in order to resonate the opinions and national characteristics of participants throughout the university establishment process, as many developing countries do not appear to be ready for the e-learning which is taking place in the developed world in terms of ICT infrastructure and relevant government policies .

Though there are many e-learning models and theories widely used in instructional design, it is not suitable to directly apply them to the developing countries. The ADDIE (Analysis, Design, Development, Implementation, and Evaluation) model is an instructional design model predominantly used in the content development using multimedia but has some significant weaknesses. It assumes that the instructional designer knows all of the requirements related to the content development (Culatta, 2013) and ignores supportive elements which influences strongly in learning effectiveness (Jung, 2012). The ASSURE Model is the other instructional design model to assure effective use of media in instruction. Each alphabet indicates the processes: Analysis of learners, Statement of objectives, Selection strategies, technologies, media, and materials, Utilization of technologies, media & materials, requiring learner participation, and Evaluation & revise. Those are not adequately considered multinational e-learning environments especially in the context of developing countries. In most developing countries including ASEAN, e-learning experiences and competencies, ICT infrastructure, and resources are not sufficient for effective e-learning Many researchers have pointed out that learning environment such as educational policy, the

[9] ENQA (the European Association for Quality Assurance in Higher Education): It disseminates information, experiences and good practices in the field of quality assurance (QA) in higher education to European QA agencies, public authorities and higher education institutions.

ICT infrastructure and human resources are the essential element for successful e-learning (Han, 2011; Jang, 2012). Systematically established ICT infrastructure strongly influences in quality assurance of e-learning as well (Jung &Latchem, 2012). These unique aspects need to be seriously reflected in designing and implementing multinational e-learning programs which involve a number of developing countries such as ASEAN. We see the need to devise a model which can systematically and systemically integrate environmental features and unique needs of developing countries in developing multi-national e-learning programs.

Different learning environment and e-learning readiness

Many developing as well as developed countries have different learning environments, national education policies, ICT infrastructure, e-learning experiences, and social needs (KEDI, 2010). In Korea, the U.S. and Europe with advanced e-learning systems, the ICT infrastructure is top-notch while the ICT infrastructure of the developing countries in the ASEAN region is archaic (OECD, 2011) (Figure 1.1).

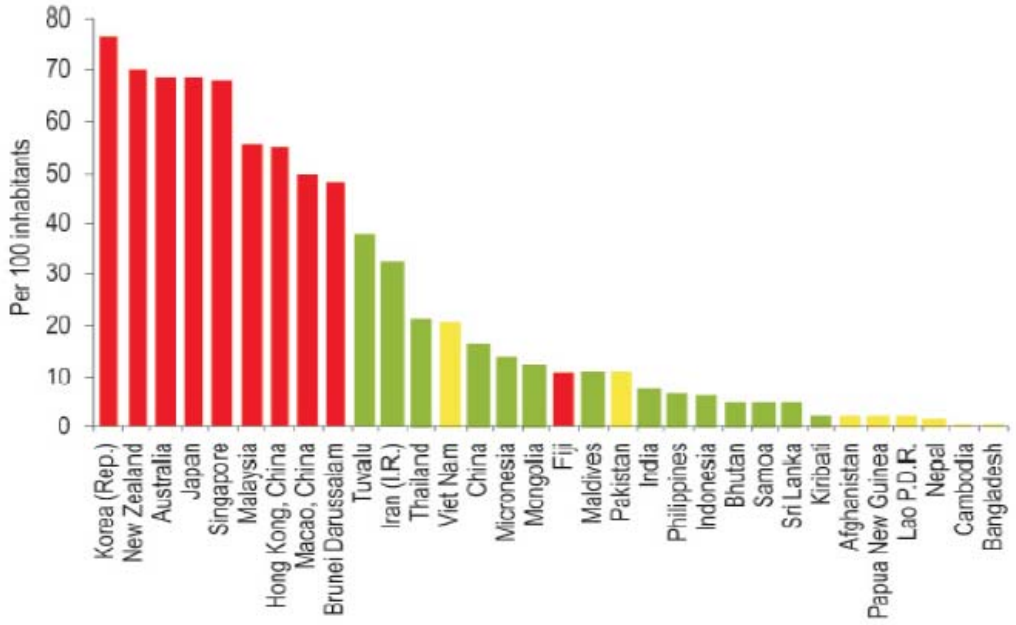

Figure 1.1 Internet supply ratio
Source: MEST & KERIS, 2010, p.15[10]

Moreover, the countries where the use of e-learning is prevalent not only have human resources and educational policies to operate e-learning with but also the majority of e-learning users are equipped with prior e-learning experience. On the contrary, the developing

[10] From "Research and analysis of cyber education in ASEAN 10 countries," by M. Y. Cho, S. B. Han, J.Yin, and J. H. Shin, 2010, Internet Supply Ratio, CR-2010-6, p.15.

countries lack human resources and educational policies to operate e-learning in addition to a large number of inexperienced e-learning users. The ASEAN region in particular has a quite different range of quality levels in ICT infrastructure and learning environments (KERIS & MEST, 2010). In Korea, over 82.3% of the total population has computers at home and over 82.1% are connected to the high-speed Internet (KISA, 2011), which is the top among the OECD countries (OECD, 2011; OECD, 2010). In comparison, the ASEAN countries are found to be low on the computer supply ratio (Figure 1.2).

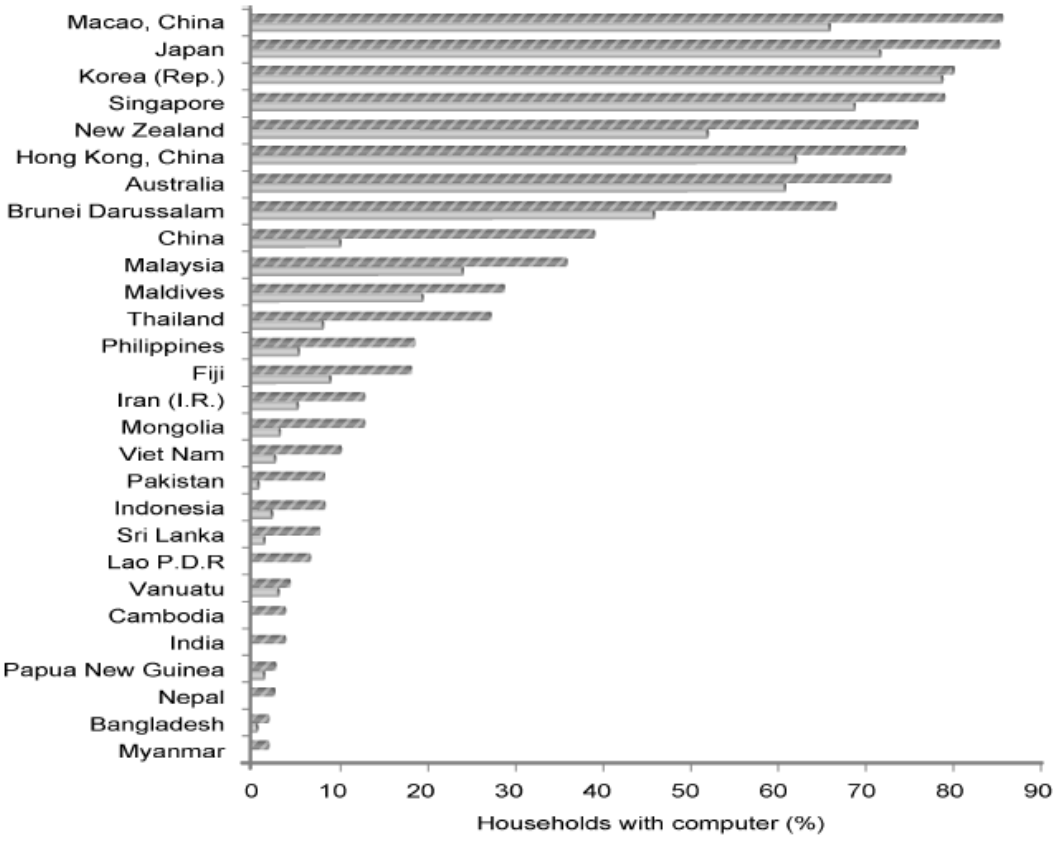

Figure 1.2 Ratio of computer households
Source: MEST & KERIS, 2010, p.18 [11]

According to the report of KERIS and MEST (2010) on the ICT distribution ratio in the ASEAN region, about 40% to 50% of the total populations in Malaysia, Thailand and Philippines had access to computer while it was less than 10% for Cambodia, Laos, Myanmar and Vietnam. The Internet accessibility in the developing countries in the ASEAN region was found to be as little as 15%~20% of that of Korea (Table 1.3).

[11] Data from "Research and analysis of cyber education in ASEAN 10 countries," by M. Y. Cho, S. B. Han, J.Yin, and J. H. Shin, 2010, Internet Supply Ratio, MEST & KERIS.CR-2010-6, p.18.

Table 1.3 *Telephone, Cellular Phone, and Internet Usage in ASEAN Countries*

(Per 100 people)

Country	Telephone Lines				Mobile Cellular Phone Subscriptions				Internet Users			
	2007	2008	2009	2010	2007	2008	2009	2010	2007	2008	2009	2010
Korea	47.5	50.1	55. 2	58.4	91.6	93.8	98.4	103.9	77.2	79.5	80.3	82.5
Brunei	21.1	21.0	20.6	20.0	97.0	103.7	105.4	109.0	44.7	46.0	49.0	50.0
Cambodia	0.3	0.3	0.4	2.5	18.9	30.7	44.8	57.6	0.5	0.5	0.5	1.3
Indonesia	8.4	12.9	14.3	15.8	40.2	59.8	67.1	91.7	5.8	7.9	8.7	9.9
Lao PDR	1.6	2.1	1.6	1.7	24.9	33.6	52.9	64.6	1.6	3.6	6.0	7.0
Malaysia	16.1	16.4	16.2	16.1	86.3	100.8	107.9	119.2	55.7	55.8	55.9	56.3
Myanmar	1.0	1.1	1.2	1.3	0.5	0.8	1.1	1.2	0.2	0.2	0.2	-
Philippines	4.4	4.5	7.4	7.3	64.7	75.5	82.4	85.7	6.0	6.2	9.0	25.0
Singapore	40.6	38.8	38.7	39.3	129.1	132.6	138.0	145.5	67.9	68.0	68.4	71.1
Thailand	10.4	10.8	10.5	10.0	78.1	90.6	96.0	103.6	20.0	18.2	20.1	21.2
Viet Nam	13.3	17.3	20.3	18.9	53.5	88.0	114.2	177.2	20.9	24.2	26.8	27.9

Source: World Bank, World Development Indicators; K-ASEAN Statistics, 2012, p.116

The status of ICT infrastructure in ASEAN countries is very poor and cannot facilitate e-learning (KERIS & MEST, 2010). Hence, it seems far-fetched to apply the e-learning system of the developed world to this region.

And the e-learning readiness in the developing world is affected by insufficient ICT infrastructure (Dunn & Marinetti, 2007; Selinger, 2003; Spillmann, Wenger & Hess, 2003), slow and expensive Internet access, and intermittent power outages. Such problems make it difficult to access e-learning contents, together with learners' lack of computer skills and an insufficient pool of qualified human resources (KEDI, 2010), and in addition, the absence of public or institutional e-learning policies is adding fuel to the fire (Ali, 2004; Pascual & Sulaiman, 2003; Van Dam & Rogers, 2002).

The digital divide caused by the economic power and ICT connectivity (Ali, 2004), the perception that e-learning cannot surpass the effects of traditional face-to-face learning, the language barrier that most of e-learning contents are in English, and cultural differences (Kerr, 2012) have become setbacks of e-learning implementation in the developing world. Moreover, there are many difficulties in applying the e-learning systems developed by developed countries to the developing world. Even the open educational resources (OER), which are freely accessible by people all over the world, are not developed from the

perspective of user countries but from the perspective of developer countries (Glen, 2011). And they are often designed with good intention of instructors for unknown learners, rather than specific learners based on a learner analysis. Hence, they are often void of the specific understanding of learners, their needs, and learning environments, which are generally present in teaching and learning. They are the result of one-way communication from instructors to learners rather than two-way communication between instructors and learners.

Purpose of the study

The purpose of this study is to develop and verify a process model which can be applied to designing and implementing a multinational e-learning system for developing countries. The development of a multinational e-learning system requires a process model as participants are involved in active discussion and negotiation. Hence, the model pertains to a process of clarifying goals and targets for a multinational e-learning system, negotiating the agenda to purpose key factors which consist of the multinational e-learning system, applying the negotiated opinions of the participants to the model development, and evaluating and revising the proposed model, while presenting both educational and policy guidelines for an effective and efficient multinational e-learning system operation. The below are the specific research objectives:

1) To analyze environmental elements (e.g., ICT infrastructure, educational policies and e-learning readiness) and e-learning needs (e.g., needs for e-learning subject areas, e-learning methods, human resources) of the participating countries: Cambodia, Laos, Myanmar and Vietnam,
2) To propose a multinational e-learning system for higher education in the ASEAN context,
3) To design and develop a process model for multinational e-learning and e-learning contents that reflect specific contextual features and needs of the participating countries, and
4) To suggest practical methods and processes to develop a sustainable multinational e-learning system in developing countries.

Significance of the study

Although many previous studies have explored and examined instructional design processes and models to improve e-learning effectiveness and efficiency, there are only few models which have taken a multinational e-learning system in higher education for developing countries into consideration. In order to design a multinational e-learning system, various learning needs, ICT levels and e-learning readiness of the participating countries need to be analyzed and acknowledged, and at the same time different ideas and agendas of the participating countries are to be clarified and discussed.

By developing and verifying a process model for multinational e-learning in higher education for developing countries, this thesis:

1) Adds a new process model, which can address the particular needs and contextual variations of developing countries in establishing a sustainable multinational e-learning system, to the existing knowledge base of instructional designs.
2) Conceptualizes and clarifies negotiation processes involved in a suggested process model, which can guide each stage of ID decisions during the model development.
3) Clarifies key factors which explains core content to develop a multinational e-learning system developed based on the suggested process model
4) Offers action research-based evidences regarding the effectiveness of a process model and negotiation strategies suggested by the model.

This is a case study of the ASEAN Cyber University Establishment Project targeting four ASEAN countries. Thus, in addition to the aforementioned theoretical contributions, this study makes practical contributions to the field of e-learning design as follows. The study helps e-learning policy makers and practitioners (including designers and instructors) to:

1) Develop effective multinational e-learning contents within a given time frame by following necessary decision-making steps.
2) State key points to develop a multinational e-learning system and e-learning courses.
3) Set up negotiation mechanisms (e.g., committees, meetings) at the right times in development, implementation and evaluation of e-learning.

Chapter 2: Literature Review

This chapter investigates previous works that are relevant to this thesis. It discusses the conceptual basis of e-learning and analyzes various instructional design theories and models such as Dick and Carey's instructional design process model, Keller's ARCS model, Reigeluth's instructional design strategies, from which the present thesis derives ideas for designing and implementing a process model for multinational e-learning. The limitations of the aforementioned instructional models have been explained to clarify the needs for a process model in the project. And to this end, action research has been used.

Conceptual basis of e-learning

E-learning is a form of learning that is carried out using computer and network technologies. It is also referred to as Internet-based distance learning, computer based training (CBT), web-based training (WBT), web-based instruction (WBI), or online learning. As education is increasingly delivered via technologies in an e-learning environment, conceptual understanding with regard to the key areas of educational technology including design, development, utilization, management and evaluation is required to design and develop e-learning systems. The following section examines each of these key areas in detail.

E-learning in the field of educational technology

The terms of 'instructional technology' and 'educational technology' are used interchangeably now, as they both encompass many settings, and emphasize the need for balance between the field's theory base and practical use (Seels & Richey, 1994). However, who uses in what context can make a little difference in their meaning. People who use the term 'Educational technology' say that 'educational' refers to learning that takes place in a variety of environments including school, home, and work, despite the differences in their meaning. On the other hand, those who prefer the term 'Instructional technology' say that 'instructional' best describes the function of technology while 'educational' implies a school or educational setting. Unlike the past definitions of educational technology, the

definition stated by AECT in 1994 describes the field not only as a theory, but also as a practice. Using the definition, which embraces both theories and practices, the term 'educational technology' extends to the entire learning process and the use of various learning resources.

"Instructional Technology is the theory and practice of design, development, utilization, management and evaluation of processes and resources for learning (Seels & Richey, 1994, p. 1)."

Educational technology introduces a technological perspective in education, and technology is generally defined using three conceptual elements: 'problem solving', 'systematic use' and 'scientific knowledge'. In other words, educational technology can be referred to as the systematic use of scientific knowledge to solve an educational problem (Rha & Jung, 1996). At the beginning of 2006, AECT redefined the concept of educational technology as a systematic approach to the research of learning processes and resources and the maximization of learning performance. It highlights two sets of practice: the use of media as learning resources for instructional purposes, and the use of systematic instructional design (Reiser & Dempsey, 2007).

These features of educational technology offer a useful framework for this thesis whose main interest is in how to design, develop, manage and evaluate a multinational e-learning system through a systematic and scientific approach. In particular, the five key areas of educational technology - design, development, utilization, management, and evaluation – that were developed (AECT, 1994) based on instructional theories and practices- help us better understand steps and tasks related to e-learning system design (Figure2.1).

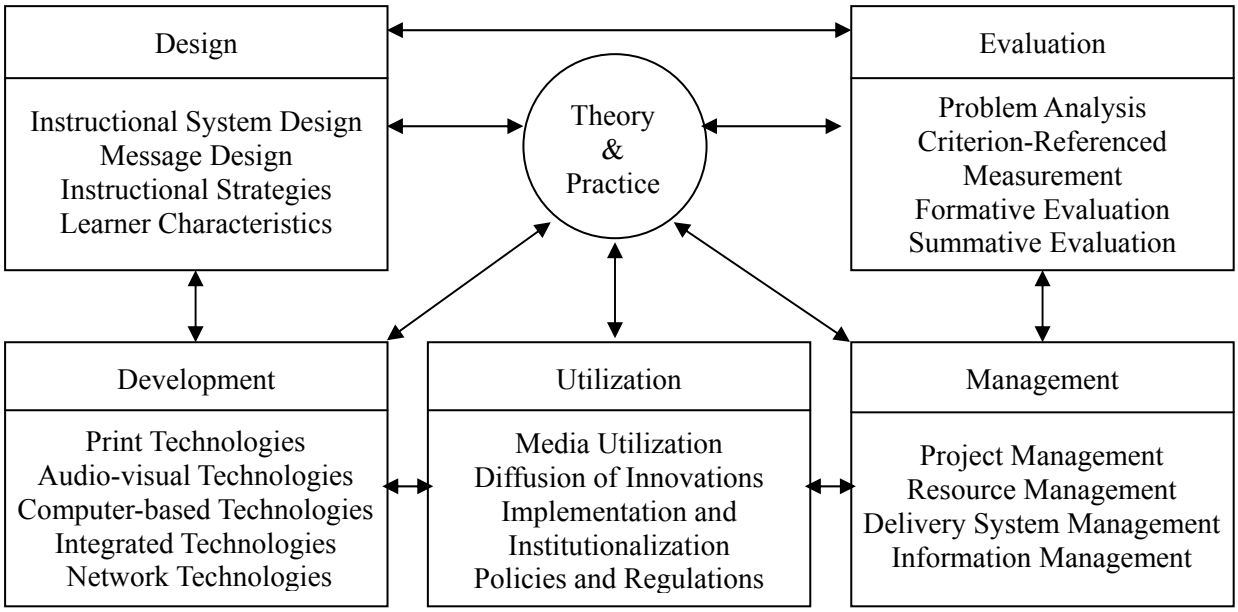

Figure 2.1 Area of educational technology
Source: Seels & Richey, 1994, p.21

Design. Design is an area of research used to analyze various educational conditions and create methodologies and strategies that meet learning needs. This area consists of four specific areas: instructional system design, message design, instructional strategies, and learner characteristics that cover not only the application of instructional strategies to give appropriate feedback for different educational problems from a micro perspective, but also the design of the whole learning process from a macro perspective. First, the instructional system design refers to the area of research in which scientific theories and appropriate knowledge are applied toward the development of an effective instructional design. Second, the message design is the area of research, which provides the figure of a message, then chooses an appropriate message for a particular learning situation. Third, the instructional strategy researches instructional methodology while developing practical solutions based on results found by testing various learning theories. In the area of learner characteristics, researchers analyze and understand various characteristics of learners, which influence not only the learning process but also comprehension levels, and develop an appropriate plan for each type of learners.

Development. The area of Development is to develop learning programs through the use of hardware, software and various media technologies. It consists of five specific sub-categories: print technology, audio-visual technology, computer-based technology,

integration technology and network technology. The print technology is to use printed data such as textbooks. The audio-visual technology uses electronic equipment such as films, slides, TV, radio and instructional computer programs to deliver audio-visual messages. The computer based technology uses computers as an instructional medium. Tutorial software is an instructional computer program for Computer-Associated Instruction (CAI). The integration technology uses multiple forms of advanced technology. Lastly but not the least, the network technology makes use of computer network technology, most notably the Internet.

Utilization. The area of Utilization applies different processes and appropriate resources to different learning situations. This area consists of four sub-categories: media utilization, diffusion of innovation, 'implementation and institutionalization', and 'policies and regulations'. The media utilization is related to the systematic use of learning resources in education, which includes a decision-making process to choose appropriate media and apply in different learning situations. It is often required to present a concrete new idea to learners, resulting in positive cognition and behavior towards the new idea. The implementation and institutionalization assists and uses new educational technology through a specific organization. Information-oriented strategy of school education is one of the examples. The policies and regulations serve to set standards for the development and application of educational technology while including activities to solve problems in educational policies and regulations.

Management. In the area of Management, researchers control and operate learning processes and results by generalizing instructional processes such as design, tuning, and utilization. The area consists of project management, resource management, delivery system management and information management. The project management devises a plan for the design and development of an instructional project, and controls the whole process. The resource management refers to the actual process of design, management and control of a supporting system, as well as the service for using various resources, for example, cost propriety and learning effectiveness. The delivery system management refers to the design, management and control, delivery of instructional materials and concepts, which include not only technical support, but also instructional methodologies using educational software and hardware. The information management refers to the design, management and control over the use of information.

Evaluation. In the area of Evaluation, the quality and the effect of the learning purposes, contexts, and processes are determined. It consists of the areas of problem analysis, criterion-referenced measurement, formative evaluation, and summative evaluation. The problem analysis confirms a problematic situation through the collection of information related to a particular problem, including the prioritization of problems during the problem solving process (Seels & Clasgow, 1990). The criterion-referenced measurement refers to the technology used to check the learning effects and performance levels based on the previously established criteria. The formative evaluation is the improvement of instructional materials and educational programs through the collection of data related to the effectiveness and appropriateness of the said materials and programs. This process occurs while an educational program is being developed.

As it is mentioned above, there are the five areas of educational technology as a systematic and scientific approach to the design, development, utilization, management and evaluation of an e-learning system. The five areas set the goals and targets, and give indicators for design strategies in accordance with the characteristics of each area. And in line with the design strategies, e-learning systems are developed, and according to the result of a system development, e-learning is implemented. While evaluating the e-learning implementation, the final strategies are modified and supplemented. It is a process model and this thesis offers the steps and basis involved in the proposed process model. In the following section, three instructional models have been described along with its relevance and limitations in a model development.

Instructional design theories and models

Instructional design in educational technology can be summarized into two parts (Im, 1994). One is a systemic process, which consists of analysis, design, development, implementation and evaluation (Dick & Carey, 1978). And the other is method of instruction or instructional strategies, which is to research the knowledge in order to select the most suitable instructional strategies (Reigeluth & Stein, 1983). In this section, various instructional design theories and models are analyzed to identify appropriate strategies for designing and developing a process model for establishing a multinational e-learning system. By investigating about the most represented instructional design theories of systematic process; Dick & Carry's instructional design process model and ASSURE

model, the basis for steps involved in developing a multinational e-learning system is examined. In addition, reviewing the most represented instructional design models with regard to instructional strategies such as Reigeluth's instructional design strategies and Keller's ARCS model helped lay the theoretical foundation to develop e-learning programs for multinational e-learning.

Dick and Carey's instructional design process model

Figure 2.2 below is Dick and Carey´s systematic instructional design process model that encompasses design, development, utilization, and evaluation. Dick and Carey's instructional design process model propose a process involving the clarification of project targets, design, development, utilization and evaluation, which is needed in designing and implementing a multinational e-learning system. Moreover, as each step in the process is repeated based on the result of evaluation, the result of each step is supplemented and modified during the process.

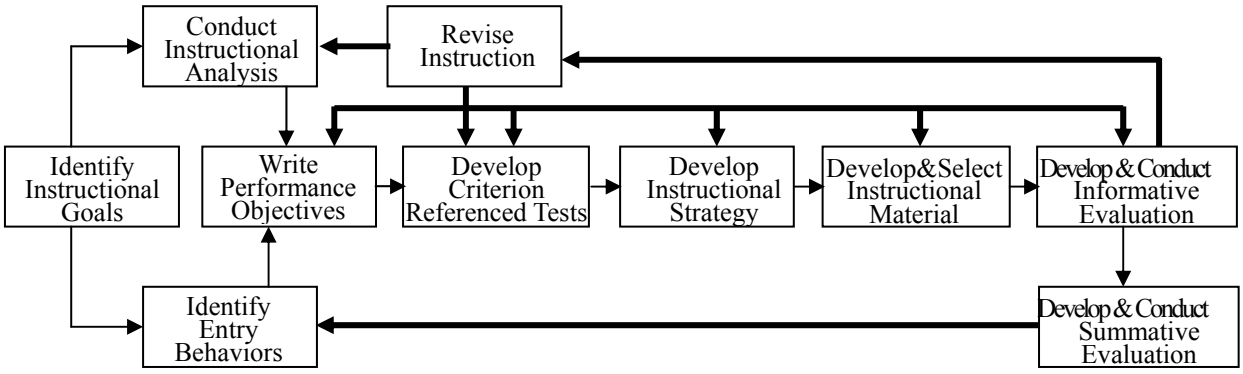

Figure 2.2 Dick and Carey's instructional design model
Source: Hassan et. al., 2012, p.2

Identifying instructional goals involves the clarification of learning activity goals based on a needs analysis and learning objectives. The process of identifying entry behaviors requires an analysis of learners' previous capability and characteristics. For an effective instructional design, it is important to establish beforehand what knowledge and technology are required for each learner. Writing performance objectives shows what learners should be able to perform after a learning activity, and how to achieve this. Instructional design should include what knowledge or material is to be covered, what technology is used, and which methodologies are most effective for learning. The criterion-referenced test (CRT) is an evaluation method that determines the results and effectiveness

of a learning activity. Development of instructional strategies involves the development of instructional strategies based on the previous instructional design process. It includes the instructional activity as a whole, in order to promote learners' motivation, to develop learners' knowledge application ability, and to evaluate the effectiveness of the learning activity. Development and selection involves the use of developed instructional strategies, such as textbooks, reference books, and instructional guidance. The development of informative evaluation involves the modification of instructional materials and instructional methods in the design process. The revision of instruction refers to the modification of and improvement to instruction based on the results of the formative evaluation. In summative evaluation, instruction is evaluated by applying the accomplished instructional model. Effectiveness is estimated through the repeated use of the instruction.

ASSURE model (Heinich, 1989) is another example of the systematic approach in clarifying a decision-making process of instructional design. Each letter in the ASSURE model represent a systematic step in an instructional design process (Table2.1).

Table 2.1 *ASSURE Model*

Analyze learners	To identify and analyze the learners' characteristic
State objectives	To State clear and specific learning purposes and objectives
Select media and materials	To select the media and technology appropriate for a particular teaching and learning environment.
Utilize media and materials	To apply media in the teaching and learning environment
Require learner participation	To encourage learners' participation in the education process
Evaluation and revise materials	To evaluate the actual effectiveness of the instruction.

Source: Heinich, Molenda, & Russell, 1993, pp. 34-35

The steps in ASSURE model involve analyzing learners' characteristics, establishing learning objectives, selecting relevant teaching and learning resources and media, conducting lectures with the selected media and encouraging the participating of learners, and by analyzing the learning effectiveness the media and instructional strategies are

modified and supplemented. The process model proposed in this thesis is founded on the theoretical basis to develop e-learning system in an order of the clarifying of the target, analysis, design, development, implementation and evaluation, just like the ASSURE Model and Dick and Carry's model.

Reigeluh's instructional design strategies

Reigeluth's instructional design strategies are theories to select relevant instructional strategies with regard to learners' learning environments. Reigeluth's strategies include guidance for media, instructors, and instructional materials. The management strategy decides when and how to use organization strategies and mediation strategies. Reigeluth suggests organizational strategy, mediation strategy, and management strategy. The organization strategy is divided into both micro strategies and macro strategies. It deals with the basic methodology of organizing learning concepts. The micro strategy involves the organization of concepts, theories, and processes while the macro strategy involves the organization and categorization of various learning topics. The mediation strategy refers to methods of delivering learning concepts to learners and eliciting responses from them about these concepts. Reigeluth (1983) asserts that instruction should begin with the easy and simple to the difficult and complex. His theory shows the appropriate methodology of selecting, sequencing, synthesizing and summarizing instructional concepts (Rha & Jung, 1996).

This thesis presents a process model for developing a multinational e-learning system along with methods with which one should reach a consensus when various countries participate and have different opinions. In addition, it proposes solutions from easy to difficult and complex problems resulted from differing interests of stakeholders through learning objectives and institutions' demands.

Keller's ARCS model

Keller's ARCS (Attention, Relevance, Confidence, and Satisfaction) model is used to promote the learning motivation of learners. Learners' motivation strongly influences the effectiveness of a learning activity (Keller, 1987). Because of this, instruction is designed to promote learners' interest in learning. There are three strategies used to capture the interest and attention of learners. First, perceptual arousal attracts learners' interest and attention by introducing new facts and interesting events. Second, investigative arousal

maintains learners' interest and attention while promoting learners' motivation through self-directed learning. Third, employing a variety of methods helps to prevent boredom.

After capturing the learners' attention, learners become able to perceive their individual needs for learning. Keller focuses on the learners' present learning purposes and interests. There are three ways to make instruction relevant to a learner. First, use examples that learners are already familiar with or interested in. Second, satisfy learners' needs and help them reach their own learning purposes by allowing learners to choose their own learning purposes. Third, use instructional strategies that coincide with learners' individual needs and motivation in order to allow them to develop their own learning purposes and strategies, and choose their own learning context.

Instilling confidence in learners encourages their learning motivation and interest, and makes them want to continue the learning activity. Keller presents three strategies to promote confidence. First, inform learners what the requirements and evaluation methods are. Then, the learners can know whether they will be able to successfully reach the goal even before instruction takes place. Second, give learners a chance to succeed using their own plan. In other words, allow learners to create their own lecture schedule and choose how they want to check their own learning progress. Learners can have more self-confidence if they are allowed to manage their own progress.

Satisfaction helps to keep motivation up, and influences the effectiveness of learning. There are three elements for promoting learners' satisfaction: internal compensation, external compensation, and consistency. The internal compensation provides learners with a chance to apply their knowledge in a real-life situation. The external compensation provides both reinforcement and feedback, which induce a desirable response. And the consistency in evaluation and the structure and context of instruction help to show fairness.

Keller's ARCS Model offers instructional design strategies, which take learner characteristics into account. This thesis offers a rationale behind the process model for developing a system, which takes the learning environment and characteristics of developing countries into account, rather than directly applying e-learning systems and programs developed in the developed countries to the developing countries

Usage and limitation of the ID models and theories

Instructional design models suggest a systematic and scientific approach to analyze, design, implement, evaluate and modify e-learning. Most of the ID models share similar components and those become theoretical basis, applicability to educational environment, and explicit processes for instructional design (Gagne, Walter, Golas, & Keller, 2005). Based on the explicit understanding of learners, the model is a preliminary step to understand the learners' level of knowledge and technology and make teaching and learning strategies to arrive at successful learning outcomes with proper learning support for each learner. Moreover, it creates learning outcomes, which can be achieved through learning, and develops methods and strategies for learning. The learning outcomes will be analyzed and used to modify and supplement the entire process of teaching and learning activities. To sum up, the following processes to design and implement of a multinational learning system are clarified as Table 2.2. The seven steps proposed in the table below have been used as a theoretical foundation of the process model to develop a multinational e-learning system.

Table 2.2 *General Components and Design Processes for a Process Model*

1) Analysis of learners and learnining environment (Dick and Carey, 1996; Hassan et. Al., 2012; Seels & Richey, 1994)
2) Based on the result of analysis on 1), clarify targets and purposes (Hassan et. al, 2012; Seels & Richey, 1994)
3) Establish plans and strategies (Dick and Carey, 1996; Hassan et. al, 2012; Seels & Richey, 1994)
4) Develop learning materials and a learning management system using various ICT and media. (Dick and Carey, 1996; Hassan et. al, 2012; Seels & Richey, 1994)
5) Implement e-learning (Seels & Richey, 1994)
6) Research learners' satisfaction and learning effectiveness (Dick and Carey, 1996; Hassan et. al, 2012; Seels & Richey, 1994)
7) Revise priorities such as a draft of strategies based on the result of evaluation (Dick & Carey, 1996; Hassan et. al., 2012)

O'Neill (2004) and Farrell (2004) pointed out that e-learning capacity, learner experience, technological convenience, the support for instructors and course facilitators are the important success factors in implementing high quality e-learning. According to Jung (2012), there should be Quality Assurance (QA) in e-learning and it is approached in three levels: institutional level, program level, and course level. But just like other e-learning design models, Dick and Carey's instructional design process model is a model solely focused on the educational area; teaching and learning activities to implement e-learning. Therefore, it has limitations of including and taking account of elements in environmental and supportive areas.

Furthermore, such instructional design models of this sort have limitations in directly applying to the multinational learning environment which have differences in learning environment, culture, and policy. Furthermore, the methods to achieve learning outcomes are not limited to the proposed methods in the preliminary process and what's more, they are criticized for applying the same learning media and technology to every learner (Smaldino, 2013). In the knowledge-based society, learners have different preliminary knowledge and characteristics, learning through various media. In addition, problems facing the modern society are intertwined with complexities that cannot be resolved with the aforementioned teaching and learning models. In order to implement e-learning that transcends time and space in modern societies, the linear way to teach diverse learners seems restrained. The needs of various learners should be analyzed along with the development of e-learning contents that reflect their different learning environment. As a way to apply the method in different countries, users' opinions should be strongly reflected while finding a way to mediate their differing views.

In the following section, the e-learning environment and readiness in ten (10) ASEAN countries have been examined in order to perceive the characteristics and demands of developing countries in the ASEAN region and to develop a multinational e-learning system that meets the users' needs.

Environment and readiness of e-Learning in ASEAN region

Overview of ASEAN Countries

General information of ten (10) countries in ASEAN such as the nation's total land area, religion, and common languages is as following Table 4.1. As has been shown on the Table 2.3 below, some of them have similarities. In particular, the language, religion and social and cultural environments of Brunei, Malaysia and Singapore are quite similar. Linguistically, six countries belong to the English-speaking world. However, it is difficult to find the common language among all countries in ASEAN region.

Table 2.3 *General Information of ASEAN Countries*

Country	Capital	Population (Million)	Area	Religion	Language
Brunei	Bandar Seri Begawan	8.7	6,000 ㎢	Muslim (67%), Buddhist (13%), Christian (10%)	Malay (Official Language), Chinese, English and other
Malaysia	Kuala Lumpur	27	329,733 ㎢	Muslim (State religion), Buddhism, Hinduism	Malay (Official Language), Chinese, English
Singapore	Singapore	4.8	682 ㎢	Buddhism, Muslim, Christian	Malay, Chinese, English
Indonesia	Jakarta	228.3	190,000 ㎢	Buddhism (87%), Christian (6%), Catholic (3%)	Bahasa Indonesia (Indi)
Philippine	Manila	90.4	300,000 ㎢, (Mountainous Area 65%)	Catholic (83%), Protestantism (9%), Muslim (5%), Buddhism & others (3%)	English (Tagalong)
Thailand	Bangkok	67.4	5,140,000 ㎢	Buddhism (Hinayanist, 5%), Muslim (4.5%), Christian (0.8%)	Thai (Official Language), Chinese, Malay
Vietnam	Hanoi	86.2	330,000 ㎢	Buddhism (80%), Catholic (7.5%)	Vietnamese
Cambodia	Phnom Penh	14.7	181,035 ㎢	Buddhism	Khmer (Official Language), French(Over 50 ages), English (Young Age group)
Laos	Vientiane	621	237,000 ㎢	Buddhism (90%)	Lao (Official Language), French
Myanmar	Nay Phi Daw	49.2	677,000 ㎢	Buddhism (86%), Hinduism (4%), Ethnic Chinese (4%), Catholic (2%)	Myanmar, English (Major city)

Source: MEST & KERIS, 2010, p. 14 [12]

[12] From "Research and analysis of cyber education in ASEAN 10 countries," by M. Y. Cho, S. B. Han, J. Yin, and J. H. Shin, 2010, Internet Supply Ratio, CR-2010-6, p.14.

By analyzing the structure production on Gross Domestic Products (GDP) of the ASEAN countries, the prediction of educational demands to train manpower can be made on the basis of demands from the economic development. Apart from Brunei, Singapore, Vietnam, Indonesia, other ASEAN member states have the production and employment structure of primary industries with a lack of secondary industries (Figure 2.3), therefore in the short term, they need to improve the production of primary industries and develop the human resources needed to establish the infrastructure of secondary industries (Kwon., 2012, p.10)

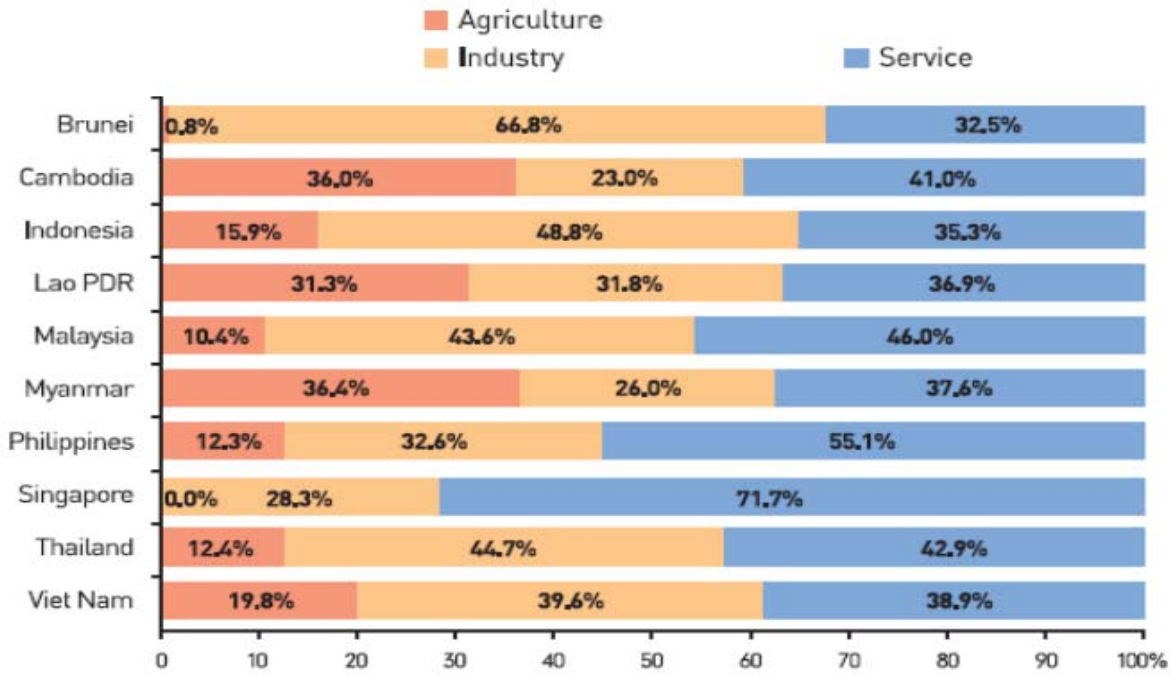

Figure 2.3 Production structure on GDP
Source: World Bank, IMF 2011; MEST, 2012, p.11[13]

According to the result of unemployment rates of the ASEAN countries between 1995 and 2010, the unemployment rate is on the rise (Table 2.4). Measures to reduce the unemployment rate such as quality vocational training programs should be in place to reinforce the connection between education and labor market (Kwon, Seo, & Han, 2012; MEST, 2012)

[13] MEST (2012). "Feasibility study for establishment of ASEAN Cyber University", by Kwon, G. S., Seo, Y. R., and Han, S. B., pp.10-11.

Table 2.4 *Unemployment Rate of 15 to 24-year-olds in ASEAN*

Country	1995 (year)	2010 (year)
Brunei Darussalam	...	...
Cambodia	12.2 (1998)	3.4 (2008)
Indonesia	15.5(1996)	22.2 (2009)
Loader	5.0	...
Malaysia	8.7(1998)	10.9 (2008)
Myanmar	...	...
Philippines	16.1	17.4 (2009)
Singapore	5.0	12.9 (2009)
Thailand	2.5(1996)	4.3 (2009)
Viet Nam	3.1(1996)	4.6 (2009)

Source: ADB, 2012, p.185 [14]

Educational status of ASEAN Countries

The educational status of 10 ASEAN countries is as follows (MEST & KERIS, 2010, pp. 24-38). In Brunei, the government funds the education for every citizen from elementary school to university. Outstanding university students are awarded the opportunities to study abroad. Malaysia is a multiracial country where mandatory education begins from elementary school. It plans a national integration through education. Though the tuition is affordable, there are limited admission spots among which 50~55% are set aside for the Malays (MEST & KERIS, 2010, p26). Since the number of four-year universities is limited in Malaysia, the admission quota is also restricted. Due to the restricted admission quotas in the four-year universities, private universities are setting up a system to award degrees through various ways in order to accommodate students who would otherwise study abroad. In Singapore, there are many satellite campuses of prestigious universities where students can attend the programs offered by U.S, UK and Australian universities. As the Singaporean government invests in improving the educational system and high quality educational services, it offers international educational services to its citizens. In Brunei, Malaysia and Singapore, professional educational institutes are in a different category from universities in an effort to provide systematic education in order to develop human resources. In addition, there are many higher educational institutes of high quality.

[14] From "Key Indicators for Asia and the Pacific", ADB, 2012, p. 178. From http://www.wilsoncenter.org/sites/default/files/ADB_Key%20Indicators%202012%20Report.pdf

In Indonesia, the growth of higher education institutions is lower than that of others. This is due to the fact that many high school graduates opt to work since the university tuition is costly in comparison with the average income. In Philippine, the university entrance rate is 28% of the total population while the high school entrance rate is 35% (MEST & KERIS, 2010, p. 27). The education is delivered in English and the local language and the level of English usage is very high. In Thailand, since the majority of universities are located in the capital, there are few university students receiving higher education in the rural areas. With the system centered on national universities, the lion share of university budgets is financed by the state. In Vietnam, half of the university is to offer teacher training programs. Among the university students, half of them is full-time students while the other half are juggling study and work. The employment rate after university graduation is less than 50%. In Indonesia, the Philippines, Thailand, Vietnam, there is a great gap between the education in the urban areas and the rural areas. E-learning can be reinforced to ease the gap, e-learning.

According to the result, the education for the lower class in Cambodia, Laos and Myanmar is found to be poor (MEST & KERIS, 2010, pp. 28-29). In Cambodia, there are increasing numbers of international schools with the influx of foreigners from neighboring countries. With rising population growth, especially a growing number of youth, the impact of the support for higher education will be great. In Laos, for the national agriculture-based development, it offers training programs to teach irrigation techniques. In consideration of a low computer penetration rate and expensive network service fees, students may not be able to take e-learning lessons at home but at learning centers or with other supportive media. In terms of popularity, the school of medicine is the most popular, followed by the school of dentistry, the school of pharmacy, and the school of foreign languages. Korean language is ranked fifth among the popular foreign languages. About 30% of the university graduates are in the labor market (MEST & KERIS, 2010, p.29). As the government begins to expand the ICT infrastructure, e-learning infrastructure would soon be expected to improve. With Yangon as the center, the demand for intellectual workers is increasing. Through e-learning, the polarization of educational opportunities will be resolved. The current status of education in 10 ASEAN countries is as following table 2.5

Table 2.5 *Educational Status of ASEAN Countries*

Country	Contents
Brunei	• The government funds the education for every citizen from elementary school to university. Outstanding university students are awarded the opportunities to study abroad. • In last 10 years, the budget for education has doubled to 430 million Brunei dollars.
Malaysia	• Offering professional vocational training at vocational colleges or technical colleges • Though the tuition is affordable, there are limited admission spots among which 50~55% are set aside for the Malays.
Singapore	• There are five polytechnic institutions for higher education, three universities and 35 international schools. 15 of them are English-medium schools. • There are more than 100 international educational courses from prestigious schools in the world. It is possible to complete the higher education in prestigious schools in the US. • More than 50% of the faculty in national universities such NSU and NTU are from overseas while 20% of undergraduate students and 50% of graduate students are recruited outside Singapore.
Indonesia	• There were 3,497,420 high school students in the 2005~2006 academic year. Among them 48% go on to universities. • There are four-year universities and junior colleges. In the 2005～06 academic year, there were 2,691,810 in 2,364 higher education institutions
Philippines	• The educational system is divided into 3 steps: 6 years of elementary school, 4 years of high school and 4 years of university. • According to university majors, the duration of courses is two years, four years, six years or eight years. • University education generally consists of two years of liberal arts. For the schools of dentistry and engineering, the programs last for six years. • Law school is for eight years and for the students of external medicine, one year of internship is included in the program.
Thailand	• There are 14 national universities, 2 national open universities and 36 teachers colleges. • The educational administration of primary and secondary schools (including private schools) are under the jurisdiction of Ministry of education while national and private universities are monitored by Ministry of university affairs.
Vietnam	• There are 126 higher education institutions nationwide. 62 of them are teachers colleges to train teachers. • As a measure to promote universities, five universities; Hanoi national university, Ho Chi Minh national university, Thai Nguyen University, Hue University and Da Nang University were established.

Cambodia	• There are 7 universities in the Cambodian capital, Phnom Penh and four in Siem Reap. The size of the universities is not large. They usually have one huge building.
Laos	• The university entrance rate is below 2% of the total population. As of 2007, the number of university students was 37,903. • In 1996, by consolidating three universities and 9 polytechnic universities, the only university in Laos, Laos national university was established. • Laos National University has 10 schools: school of natural sciences, school of education, school of social sciences, school of humanity, school of business administration, school of agriculture, school of forestry, school of medicine and school of law and economics with 600 faculty members.
Myanmar	• There are 14 universities in Yangon (which was the former capital until 2005) and there are quite many colleges in major cities. • Outstanding students are concentrated at the universities in Yangon, and there is a huge gap in university level between the universities in Yangon and the universities outside Yangon.

Source: MEST, 2012, p.183; MEST & KERIS, 2010, pp. 24-38

ICT Infrastructure of ASEAN countries

The ICT infrastructure level is different from developed country to developing country. In the developed countries with advanced e-learning, 77% of the population is online and at top of the ICT and Internet use whereas in the developing countries, there is 31% of it, which in turn shows a great difference in e-learning readiness (Figures 2.4).

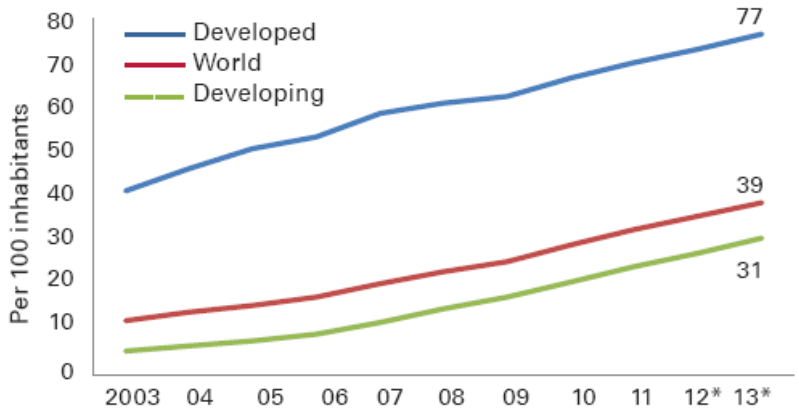

Figure 2.4 The Internet users by development level, 2003-2013
Source: ITC World Telecommunication/ICT Indicators database
Note: *Estimate, (ITU, 2013, p. 2)[15]

[15] International from http://www.itu.int/ITU-D/ict/facts/material/ICTFactsFigures2013.pdf

Comparing Internet users in Asia & Pacific to the one in Europe or in America, the difference is about twofold (Figure 2.5).

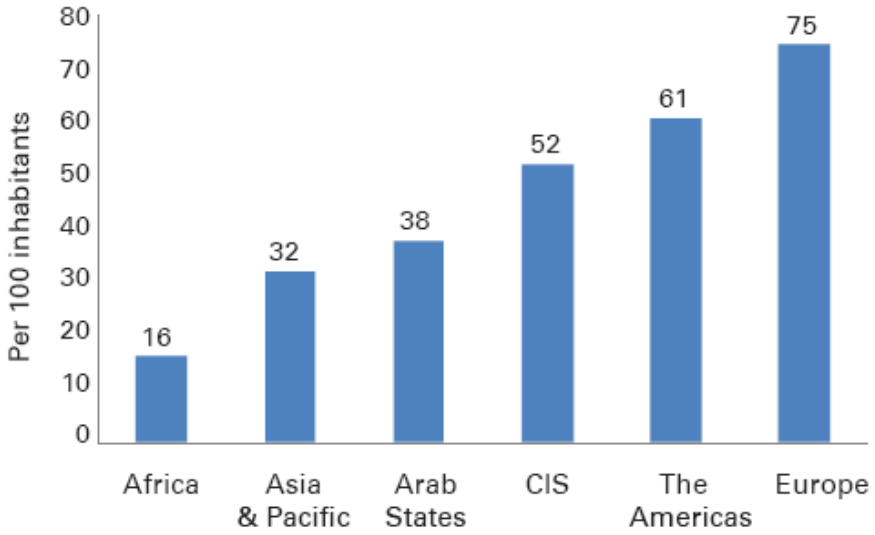

Figure 2.5 The Internet users by region, 2013
Source: ITC World Telecommunication/ICT Indicators database, (ITU, 2013, p.2) [16]

In the developed countries, 78% of people have the Internet connection at home but, 90% of the 1.1 billion people in the developing countries have not connected to the Internet (Figure 2.6).

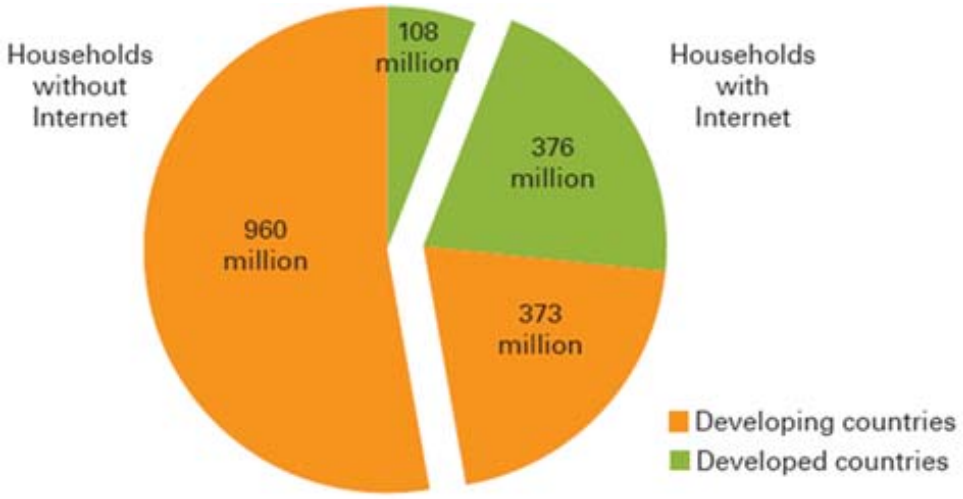

Figure 2.6 Households with Internet access, 2013
Source: ITU World Telecommunication /ICT Indicators database, (ITU, 2013, p.3)

[16] International Telecommunication Union. (2013). The world in 2013: ICT Facts and Figures from http://www.itu.int/ITU-D/ict/facts/material/ICTFactsFigures2013.pdf

Despite the rapid increase in mobile-broadband subscriptions in the world, there is still a large gap between the developed countries and the developing countries (Figure 2.7).

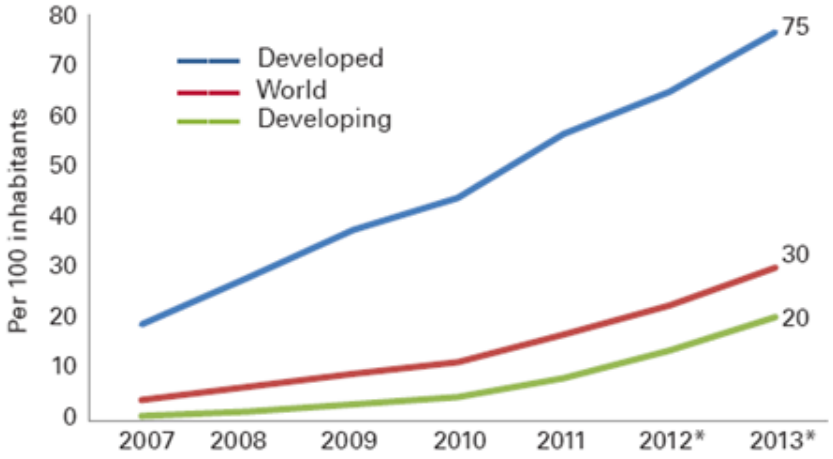

Figure 2.7 Active mobile-broadband subscription, 2007-2013
Source: ITU World Telecommunication /ICT Indicators database,
Note: * Estimate, (ITU, 2013, p. 6)

Below is the price for mobile-broadband services. The price for post-paid handset-based services is the lowest whereas the price for prepaid computer-based services is the highest. Moreover, the service price in the developing countries is 10 times as high as that of the developed countries (Figure 2.8).

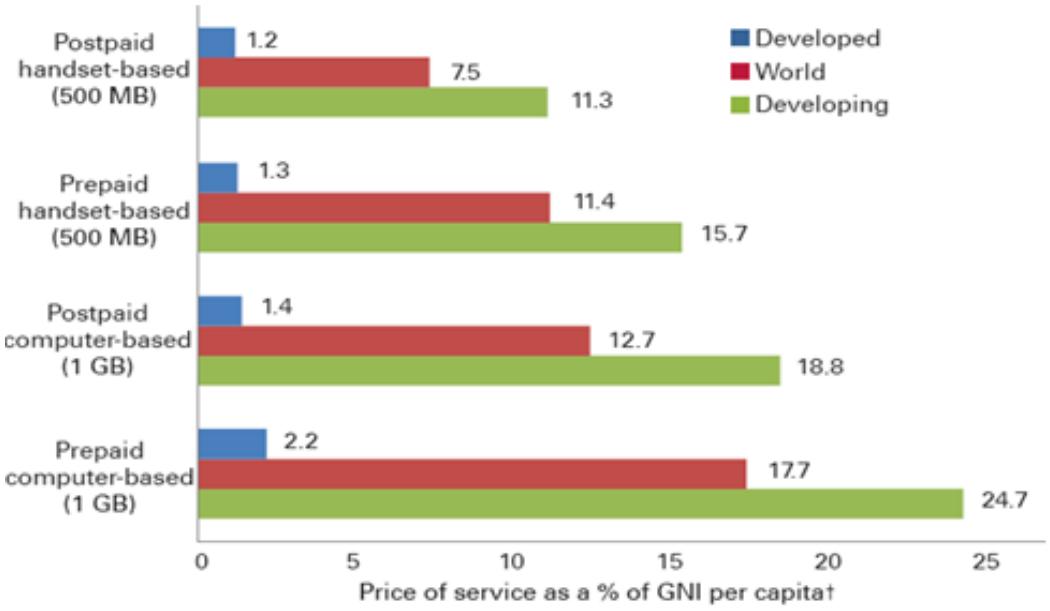

Figure 2.8 Price for mobile-broadband services
Source: ITU World Telecommunication/ICT Indicators database, (ITU, 2013, p. 6) [17]

[17] International from http://www.itu.int/ITU-D/ict/facts/material/ICTFactsFigures2013.pdf

A great difference has been noted between developed countries and developing countries in the level of ICT development and Internet penetration rate. E-learning is a factor to assess the ICT infrastructure, e-learning readiness for e-learning quality assurance (Jung, 2012). Therefore, rather than disseminating the e-learning systems and contents of the developed countries in the developing countries, an e-learning system should be developed in consideration of the necessary factors for e-learning quality assurance such as a development gap between these countries, low computer and internet penetration rates, expensive network services and a lack of manpower so that it can meet the demands of the developing countries.

Human resources of participating Countries

The ASEAN countries with the exception of Brunei, Malaysia and Singapore are ranked in the low Human Development Index group (Table 2.6). These countries need to develop human resources through education as a way to overcome the lack of natural resources to achieve national development.

Table 2.6 *Human Development Index*[18]

Regional Member	1990	2000	2011	Rank in 2011[b]
Developing Member Economies				
Southeast Asia				
Brunei Darussalam[c]	...	0.866	0.838	33
Cambodia	0.337	0.543	0.523	139
Indonesia	0.625	0.684	0.617	124
Lao PDR	0.450	0.485	0.524	138
Malaysia	0.721	0.782	0.761	61
Myanmar	...	0.552	0.483	149
Philippines	0.720	0.754	0.644	112
Singapore	0.822	0.885	0.866	26
Thailand	0.714	0.762	0.682	103
Viet Nam	0.617	0.688	0.593	128

* Rank among the 187 countries classified in UNDP'S *Human Development Report 2011*.
* Brunei is not a Developing Member but a regional member of ADB,
Source: ADB, 2012, p. 190

The following Table 2.7 shows a student-teacher ratio among the educational resources of the ASEAN countries. The student-teacher ratio in these countries has not changed a lot since the 1990s. In the modern knowledge–based society, a teacher-training program to develop human resources is much needed.

[18] Human Development Index (HDI) is an index of living standards which are based on life expectancy, education and GDP. It is annually published by the United Nations Development Program (UNDP).

Table 2.7 *Secondary Pupil-Teacher Ratio*

	Secondary Pupil–Teacher Ratio		
	1990	2000	2009
Developing Member Economies			
Southeast Asia			
Brunei Darussalam[a]	11.8 (1991)	10.9	10.5
Cambodia	20.1	18.5	28.9 (2007)
Indonesia	12.9	15.8	12.0 (2008)
Lao PDR	11.8	21.3	22.8 (2008)
Malaysia	19.3	18.4	15.0 (2007)
Myanmar	12.8 (1991)	31.9	34.5 (2008)
Philippines	33.3	36.4 (2001)	35.1 (2007)
Singapore	17.9 (1991)	...	16.4 (2008)
Thailand	16.2	24.0 (2001)	21.2 (2008)
Viet Nam	18.0	28.0	20.7 (2008)

Sources: World Development Indicators Online (World Bank 2011); University for Statistics Data Center (UNESCO 2011); for Taipei, China: Monthly Bulletin of Statistics Online. Brunei is not a Developing Member but a regional member of ADB, (ADB, 2012, p. 195)

According to the following Table 2.8, for Brunei, Malaysia and Singapore, the cost for the Internet use is less than 0.5 to 1% of the per capita national income. For Indonesia, Thailand, and Philippines, it is about 20%. For Cambodia, Laos, and Myanmar, it is over 100% of the per capita national income. In Brunei, Malaysia and Singapore, more than 40 to 50% of the national population has a personal computer. However, Cambodia, Laos, and Myanmar, only 10% of the national population has it (Table 2.8).

Table 2.8 *Internet Users per 100 People*

Country		Internet users per 100 people			
		2000	2005	2008	2010
Republic of Korea		40.5	71.0	80.2	80.9
Group1	Brunei	9.0	36.5	68.0	79.8
	Malaysia	21.4	48.6	55.8	57.6
	Singapore	32.3	61.9	69.6	73.3
Group2	Indonesia	0.9	3.6	7.9	8.7
	Thailand	3.7	15.0	23.9	25.8
	Philippines	2.0	5.4	6.2	6.5
	Vietnam	0.3	12.9	24.2	27.5
Group3	Cambodia	0.0	0.3	0.5	0.5
	Laos	0.1	0.9	3.5	4.7
	Myanmar	-	0.1	0.2	0.2

Source: GDI, World Bank, 2011; Kwon, et, al., 2012, p29

As it has been shown previously, ten ASEAN countries can be categorized into three groups according to their ICT development level, language, and social and cultural environment (Table 2.9). Countries in the same group have similarity in ICT development religion, language and culture.

Table 2.9 *Groups on ICT Status*

Group	Nation	ICT Status
Group 1	. Brunei . Malaysia . Singapore	. With high level of ICT, there is lots of possibility for educational system development and e-learning. E-learning is popular and supported by national level.
Group 2	. Indonesia . Philippines . Thailand . Vietnam	. ICT infrastructure and educational policy are developed. However, there is a gap between urban and rural.
Group 3	. Cambodia . Laos . Myanmar	. Educational plan and policy are not formulated. ICT and social infrastructure are on the beginning.

Source: Cho, 2010, p.13

In Group 1, they have been in international cooperation in a long history. They have a similar in language, religion and custom. Learning environment like educational policy, and content are similar and also strongly influenced each other. In Group 2 and Group 3, they are different in language and religion. In a perspective of education, their characteristics of individual language and customs should be considered. In Group 3, ICT infrastructure is on the worst among the groups. In this case, e-learning should be started to establish infrastructure.

e-Learning status and needs analysis of four initial participating Countries

For this thesis, three countries; Cambodia, Laos, and Myanmar in Group 3 and one, Vietnam in Group 2 on the Table 2.9 are selected as initial participating countries among the developing countries because there is a gap in e-learning readiness among 10 ASEAN countries. From now on, the current status of e-learning will be discussed with main focus on the initial participating countries (KIST, 2011, pp.10-15) (Table 2.10).

Table 2.10 *E-learning Status and Needs Analysis of Initial Participating Universities*

Country	Content	Detail
Cambodia	E-learning experiences	• Since 2004, the national University of Business has opened online educational services as part of Japan's official development assistance, offering undergraduate and graduate programs in finance, accounting, business, marketing, management, etc.
	Needs for e-learning	• Ministry of education, youth and sport: management, IT, engineering, Agriculture • University: Korean, English, Engineering
Laos	E-learning experiences	• In 2006, International Rice Research University (IRRI) organized training programs to improve the quality of produce and seeds were conducted via e-learning. • Due to the expensive internet connection, internet access is generally available to civil servants more than the general public. Only 1~2% of online services are provided.
	Needs for e-learning	• Ministry of education: technology and IT • Universities: Management, Korean, Engineering, Agriculture, Economics, English & Foreign languages
Myanmar	E-learning experiences	• Japan & Myanmar e-learning center (MICT Park) was established and MCSA/JTEC Certificate program is also available. • Japanese ministry of education provided financial support to the Burmese e-learning center establishment project. IT engineering programs and MBA are now being offered.
	Needs for e-learning	• Ministry of science and technology: expected to play the role of national e-learning hub center • University: Computer and engineering, English and foreign languages
Vietnam	E-learning experiences	• E-learning is used as a teaching aid in traditional school. There are exchange of learning resources and communication through e-learning websites, yet degree programs via e-learning are not still being offered. • With assistance of Kobe University and JICA, a course in international economics was opened and run in the Kobe area.
	Needs for e-learning	• Ministry of education and training: joint human resource development and content development • University: Courses in e-learning Korean language and English are available as part of distance education program

Source: KIST, 2011, pp. 10-15

Feasibility study in technology, economics, society & Culture, and law & regulation of the initial participating universities (KIST, 2011, pp.16-17)

With focus on four initial participating countries, the result analysis of technological, economic, social/cultural and legal validities is summarized as follows.

Technology. Due to the ICT gap between the developed countries and the developing countries, if the learning management systems (LMS) and e-learning contents in the developed countries are to be applied, e-learning management cannot be expected to be easily and favorably. Since the ICT infrastructure is rapidly growing, high speed Internet is expected to spread in a couple of years in the developing countries. However until then, it is reasonable for learners to use e-learning contents at a local e-learning center in their university.

Economics. Since 2004, Cambodia has adopted a rectangular strategy[19] to reduce poverty and develop its economy. Recently, Laos employed a rapid reform policy. The initial participating countries; CLMV are pushing ahead with economic development plans. In spite of the rapid increase in demand for higher education, CLMV countries find it hard to meet the demands due to the lack of ICT infrastructure for e-learning higher education. With Vietnam as the center among CLMV, the demand for highly qualified human resources in the field of technology and science is growing. By applying e-learning in CLMV countries where institutions for higher education are scarce, opportunities for higher education can be effectively expanded.

Society and culture. Participating universities have the needs of e-learning programs in Korean language and engineering. Moreover, in consideration of positive effects to enhance the national image of Korea which contributes e-learning knowhow to the developing countries can be reinforced together with the spread of Korean culture.

Law and regulation. Though there are no legal system and restrictions with regard to e-learning, a credit transfer system is a must to utilize e-learning among participating

[19] Rectangular Strategy: "The Rectangular Strategy" for growth, employment, equity and efficiency in Cambodia, which will become an important tool to support the implementation of "the political platform of the Royal Government of the third legislature of the National Assembly". First Cabinet Meeting of The Third Legislature of the National Assembly At The Office of the Council of Ministers Phnom Penh, July 2004, p.2,
From http://www.cdc-crdb.gov.kh/cdc/aid_management/RGC_Rectangular_Strategy_2004.pdf

universities in the multinational context. Since the systems and regulations for credit transfer are not in place, there should be explicit e-learning policies in implementation of the credit transfer. The result of a feasibility study can be arranged as a SWOT analysis[20] shown in Table 2.11.

Table 2.11 *Feasibility Study in Technology, Economics, Society & Culture, and Law & Regulation of the Initial Participating Universities*

Type	Strategy
Opportunity · Strength (OS)	• Securing and adopting excellent e-learning solutions in online universities in Korea • Establishing a system infrastructure for e-learning based on the Internet in order to connect ROK and ASEAN ten countries • Providing support for the activities of e-learning experts and the establishment of a cyber university for the developing countries • Establishing a system for the research in sustainable development and joint research and development (R&D) of joint degree programs for the purpose of the cyber university establishment for the developing countries • Developing human resources for the educational informatization, applying successful examples of the Korean educational informatization
Threat · Strength (TS)	• Planning to implement the multinational e-learning system in order to reinforce the quality assurance of e-learning in a global context. • Increasing the overseas development assistance to expand the e-learning infrastructure in an effort to close the gap of knowledge and information among participating countries in ASEAN region • Using ROK-ASEAN cyber university to advertise outstanding Korean e-learning solutions to the global market
Opportunity · Weakness (OW)	• Preparing to dominate the e-learning market by supporting the establishment of ICT infrastructure and e-learning environments in CLMV • Developing multilingual human resources • Making up an organizational structure between the Ministry of Education, Science and Technology of Korea and the ASEAN members to develop a multinational e-learning system with integrated planning for the establishment of a cyber university • Establishing a system of cooperation with overseas e-learning experts (professors and researchers) from the designing and implementing of a multinational e-learning system and a cyber university establishment
Threat · Weakness (TW)	• By cooperating with the existing networks such as AUN, the existing infrastructure and the key educational bases can be utilized. • Appointing the Korean companies with the experience of carrying out the educational informatization projects in developing countries, which can compete with the global conglomerates

Source: KIST, 2011, pp.16-17

[20] SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis

Summary

There is a huge difference in e-learning readiness between the developed countries and the developing countries in terms of developmental status of ICT infrastructure such as internet accessibility, computer usage and network stability especially related to e-learning environment. At present, though it is true that the ICT infrastructure and its related policies are spreading rapidly in the developing countries in the ASEAN region, the number of internet users in these countries is only half of that in the developed countries and the number of people without internet access in the developing countries is nine times less than that of the developed countries. Furthermore, the mobile-broadband subscription in the developing countries is 3.5 times less and the network service fee is ten to twenty times costly than that of the developed countries. Therefore, in the light of the current status, rather than directly applying the e-learning type used in the developed countries to the developing countries a new e-learning system should be developed with consideration of the characteristics of e-learning environment in the developing countries.

In addition, ten countries in ASEAN region have different characteristics in terms of ICT infrastructure, educational needs, language, religion, and social & cultural customs. Hence, an e-learning system that can meet the demands of various countries while taking the differences and similarities so that all the member states can take part in the system development. In the case of developing countries, although the demand for higher education is increasing, the youth unemployment rate is also climbing. With the quality vocational training and higher education, measures with which education is connected with employment should be in place. Furthermore, human resource development programs such as teacher training programs to manage and support e-learning and instructors in higher education need to be supplied.

As a result, e-learning system generally used in the developed countries is difficult to directly apply to the developing countries in the ASEAN region due to the gap in the ICT infrastructure, e-learning experience, human resource, social needs and etc. Furthermore, the e-learning readiness in the developing countries in ASEAN region also varies greatly from country to country. Therefore, rather than applying the e-learning system of the developed countries to the developing countries in the ASEAN region it is prudent to develop an e-learning system and educational programs by taking different characteristics

of each country into account and reflecting participants' opinions in the target countries. What's more, by involving the government officials and representatives of participating countries in development of a process model to design and implement a multinational e-learning system, it will meet the user characteristics and expectations while bolstering e-learning for the developing countries in ASEAN region.

Chapter 3: Methodology

This thesis aims to develop a model for establishing a multinational e-learning system for developing countries. By analyzing the learning environmental factors in the developing countries of the ASEAN region such as ICT infrastructure, educational policies, e-learning personnel, and e-learning experience with regard to e-learning readiness, considerations to implement e-learning in the developing world have been discussed. Based on the above result analysis, a process instructional design (ID) model to design and implement a multinational e-learning system is proposed, and for the proposed ID model, opinions of the ASEAN member countries have been gathered and reflected on the development of a multinational e-learning system and e-learning contents while tailoring to the requests of the system users. Using the developed model, pilot multinational e-learning system is being implemented in one of the developing countries. A user satisfaction survey is conducted to assess and elaborate the model. And finally, an ID model to design and implement a multinational e-learning system is proposed along with detailed strategies and considerations.

Context

Multinational e-learning system

The terms used in this thesis, 'Multinational education' is used interchangeably with 'cross-border education' or 'transnational education' (UNESCO, 2011). This is due to the fact that cross-border education or transnational education indicates the education for learners from different countries. In addition, the term 'e-learning system' in this thesis does not only mean 'learning management system (LMS)', which acts as a virtual classroom in e-learning but an overall system for e-learning that takes the learning environmental factors such as the institutional support for policies and infrastructure to ensure the quality of e-learning, educational factors related to offer training programs to improve the teaching and learning activity and evaluation, and the supportive factors such as information provision, technical support and human resources support. Hence, the multinational e-learning system for the developing countries, proposed in the thesis implies an overall e-learning system to implement e-learning in various developing countries.

ASEAN Cyber University Establishment Project

The ASEAN Cyber University Establishment Project (hereinafter referred to as the ACU project) is a case study of this thesis, which is a collaborative project to establish a multinational cyber university called ROK-ASEAN Cyber University. The ROK-ASEAN Cyber University is a multinational cyber university providing online higher education to ten (10) countries in ASEAN region. In 2009, at the request of the Secretary General of ASEAN the project for a ROK-ASEAN Cyber University was launched as part of the ODA projects by the Ministry of Education, Technology and Science of Korea. The project aims to do the following (MEST, 2012); 1) Promote higher education and reinforce mutual cooperation among ASEAN Member States and ACU Member Universities through on-line educational services, 2) Encourage the ASEAN Member States and ACU Member Universities to share their experience and know-how in education, and contribute to the academic advancement in the ASEAN region. 3) Aim to reduce the education gaps and facilitate academic exchange among ASEAN member states by building substantial e-learning capacity of participating countries as well as by developing and operating a common curriculum, and ultimately establishing the ASEAN Cyber University.

Action research

This thesis was conducted in the form of action research with the participation of government officials and university representatives from target countries of ASEAN. The action research is a kind of collaboration research to find the solution by participants' discussion, debate and negotiation. It helps to find the alternative or a direct solution to fix a problem by repeated implementation of reflection. The four stage process of Sagor (2011) and the RADPAC model are adopted to reflect and negotiate participants' opinion for a model development

Four-stage process

According to Sagor (2011), four stages of the action research are as follows; plans, action, observation and reflection on Figure 3.1. To reach various research goals which are prearranged by a researcher, four stages are often implemented repeatedly.

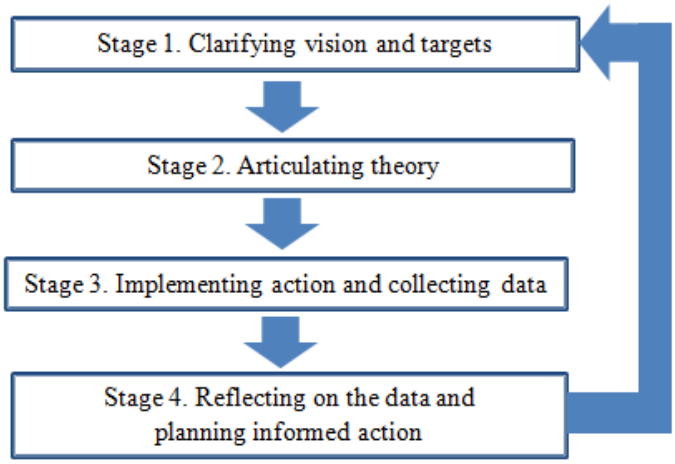

Figure 3.1 Four stages of action research
Source: Sagor, 2011, pp. 8-11

At the Stage 1 on Figure 2.4 above, a researcher clarify a problem with vision and targets. In this stage, goals and sub-skills are enunciated and specific criteria are clearly identified. And then at the Stage 2, a researcher makes alternative strategies based on theoretical background including examining and incorporating any kinds of possible relationships and interactions he/she believe exist between the factors influencing to solve a problem identified in the Stage 1. At the Stage 3, this is to determine what is being accomplished and the relationship between the actions being taken and the results being obtained (Sagor, 2011). By implementing the alternative, a researcher can examine whether it works to solve a problem or not. At the Stage 4, based on the collected data regarding the impact of implementing action, the theory of action is examined. In a case of that the theory is not enough as a successful solution, a researcher revises the theory of action and resets the alternative to find the best way to solve a problem. Repeated improvement of these four stages helps to find the reason and the solution or at least the alternative. It also can make generalization consequentially.

RADPAC model of negotiation

RADPAC model suggests another way of doing action research and a way of negotiation during the research process. RADPAC model is adapted to the 'Stage2 design by negotiation' of the suggested model for this thesis. When there is a disagreement among stakeholders, the model suggests a method with which a final plan can be drawn with mediation. Each alphabet signifies and suggests what to do when it is necessary to negotiate something with more than two people or groups in a conflict of interests (Figure 3.2).

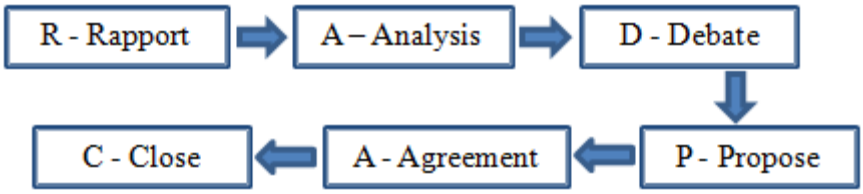

Figure 3.2 RADPAC model
Source: Sagor, 2011

Rapport is the stage to make each participant comfortable to cooperate in a good mood. For example, in this stage, participants introduce each other briefly and become ready to communicate. Analysis is to start to understand each other. Participants share what they want to do and think about a given matter and carefully figure out what the others' want. Debate is to discuss. In this stage, each party starts to exchange own ideas and try to convince the other party of own ideas for negotiation. Propose is to suggest one's best ideas and solutions to draw a conclusion accepted by everyone. Agreement is the stage to make a conclusion as the best possible alternative. Close is the end of the negotiation.

Participants

According to the previous research on e-learning readiness of ten ASEAN countries, there found to be huge differences among the countries in the elements of e-learning implementation such as ICT infrastructure, e-learning, e-learning application experience, human resources, and educational policies. These ASEAN countries have not only different historical and cultural backgrounds but also different educational policies and experiences. Since there are differences in e-learning readiness of the ten ASEAN countries, they can be categorized into three groups.

Among the three groups, three countries in Group 3 that lack the e-learning readiness the most were selected as initial participating countries which are required to be enhanced their e-learning readiness on a par with the others. The countries in Group 3 were the Kingdom of Cambodia (hereinafter referred to as Cambodia), Lao People's Democratic Republic (hereinafter referred to as Laos), and Republic of the Union of Myanmar (hereinafter referred to as Myanmar). In the case of Socialist Republic of Vietnam (hereinafter referred to as Vietnam), though it belongs to Group 2, it was selected to lead Group3 for it has often been an exemplary country with development policies for the countries in Group 3.

This thesis employed action research methodology and negotiation to draw the common requirements of participants from the initial participating members of the ACU project, which are composed of the Cambodia, Laos, Myanmar and Vietnam (hereinafter refer to as CLMV) among ASEAN countries. To implement multinational e-learning at the developing countries in ASEAN region, their common interests have been drawn to reflect on the design, development and implementation of a model.

With the participation of the government officials of initial participating countries; CLMV, and one representative from each of the initial participating universities, the model for a multinational e-learning system is designed, developed and implemented. From each of the four participating countries, four universities were selected as initial participating universities because they received active support in terms of ICT infrastructure and manpower from their governments to spread ICT. In this thesis, the names of participating universities are labeled as University A, B, C and D to protect their institutional information and data.

Scope of work

This thesis is to develop a process model, which proposes steps and methods to develop a multinational e-learning system in order to provide higher education programs to developing countries. The process model proposed in this thesis presents the methods and a process, starting from the clarifying of goals and targets, analysis of learning environments, model design, system development and implementation, and evaluation.

Procedure of the study

In order to implement a multinational e-learning system for students from different countries, there are four steps to follow: analysis, design & development, implementation & evaluation, and reflection & model elaboration. The model is completed by clarifying processes and methodologies with the result of each step. The key factors of the multi-national e-learning system are also clarified for quality assurance of e-learning implemented in the multinational context.

Analysis stage

Literature review is conducted to analyze the learning environments of the ASEAN countries with focus on e-learning readiness as follows;

- Overview of ASEAN countries
- Educational status of ASEAN countries
- ICT infrastructure of ASEAN countries
- Human resource of ASEAN countries
- E-learning status and needs of four initial targeting countries; CLMV

From the result of the above analyses of e-learning readiness, merits, demerits, advantages and risks to develop a process model to design and implement a multinational e-learning system are investigated to be jointly used among the developing countries in the ASEAN region. Models and theories of educational technology were also reviewed to design and develop the model.

- To analyze e-learning readiness of the initial participating countries, the present status of learning environment such as educational policies, human resources, e-learning experiences, ICT infrastructures of the developing country in ASEAN region was researched.
- To develop an ID model to design and implement a multi-national e-learning system for higher education, various ID models and the action research methodology are reviewed.

Design and development stage

At this stage, a process model to design and implement a multinational e-learning system is developed according to the following steps. First, e-learning environment of the ASEAN countries is researched and analyzed to clarify their e-learning readiness. Second, consideration domains of the multinational e-learning system are clarified based on the assessment areas for e-learning quality assurance. Third, according to the action research methodology, the process model to design and implement a multinational e-learning system in the context of e-learning environment of the developing countries is developed by discussion, debate and negotiation of participants from government officials and

university representatives of four initial target countries. The model includes the mission statements, specific processes and key factors for design and development of a multinational e-learning system. A pilot multinational e-learning system and e-learning contents are designed and developed based on the consideration of the result analysis of learning environment of the developing countries in ASEAN region.

- With reference to the five areas of educational technology and instructional design models such as ASSURE model and the Dick and Carey's Instructional Design Model, a process model to design and implement a multinational e-learning system is proposed as the first draft.
- Based on the first draft of the proposed model, requests and opinions of participating countries to operate a multinational e-learning system were collected and reflected to upgrade the model. For negotiation among the participants, the second stage of the suggested model implies four basic steps of action research as suggested by O'Brien (1998) and Sagor (2011): Clarifying vision & targets, Articulating theory, Implementing & collecting data, and Reflecting & planning informed action.
- Five quality assurance areas for e-learning which are common domains of the best practices for electronically offered degree and certificate program (2000) by the U.S eight regional accrediting commissions and the Jung's quality assurance criteria for e-learning have been reviewed to determine the domain of multinational e-learning system. Based on the review of the mentioned quality assurance criteria, three domains for quality assurance of multinational e-learning are clarified.
- Twenty key factors in the above suggested three domains for quality assurance of multinational e-learning are clarified based on the reflection and needs analysis of participants during discussion and negotiation for the model development.

In accordance with action research methodology, the proposed model is developed and implemented through the committee participation. The process of their discussion and negotiation are referred to develop multinational e-learning system implemented for the ACU project. Based on the research methodology, three times of meetings of the Committee are held to collect participants' opinion and reflection.

Implementation & evaluation stage

In accordance with the proposed model and its key factors for multinational e-learning, a multinational e-learning system is developed and applied to the ACU project. At this stage, the ACU project has been implemented from October in 2012 to March in 2013. During the period, the proposed model has been implemented. One of the participating universities has operated the multinational e-learning system developed based on the proposed model for one semester.

Reflection and model elaboration stage

At this final stage, by analysis of operation result at one of the initial participating Universities, the proposed model was evaluated.

- User satisfaction surveys by students are examined at the end of the semester of one initial participating university called the University A.
- Interviews of representatives of participating countries and universities are reviewed to evaluate the proposed model.

Based on the results from the evaluation stage, the proposed model for a multi-national e-learning system is elaborated to improve users' satisfaction and effectiveness of multinational e-learning operation.

Data collection and analysis

To identify e-learning environment and clarify the needs of participating countries and universities, analysis of government documents and reports was carried out, a survey with students, and interviews were also conducted. For users' satisfaction investigation, online survey for students was conducted after finishing a semester composed of fifteen weeks of online lectures. Interviews of representatives of initial participating universities were accomplished to collect their reflections.

Chapter 4: Model Design

A systematic and scientific approach to multinational e-learning system development was discussed in Chapter 2 with focus on various instructional design models and theories. In this chapter, with the research participants from the developing countries, ways to develop a multinational e-learning system are discussed through action research, and as a result, a process model is proposed a process and methods to develop the multination le-learning system. The process model aims to guide the development of a multinational e-learning system, which meets the common requests and learning environments through the discussion and negotiation of the participating governments and universities, along with methods and steps to implement the system. Furthermore, in order to assure the quality of a multinational e-learning system based on the proposed process model, 20 key factors are summarized based on Jung's quality assurance index for the ASEAN region.

E-learning quality assurance in a model development

As many institutions around the globe are offering online degree programs (Copeland, 2001), the issue of designing and implementing high quality e-learning programs has emerged. And as the educational market has been opened and the need for various learning methods and quality educational programs has been increased since the 2004 WTO educational policy, the importance of quality assurance has emerged in order to raise the competitiveness of e-learning.

In Europe, there is an organization, which offers services to enhance quality in European higher education institutes, called the European University Quality in e-Learning. It controls e-learning quality standardization at an institutional level and quality marks, and evaluates online universities in 10 areas in three domains as follows (UNIQUe, 2011; Jung 2012).

1) Learning sources

- Supporting staff and teaching staff
- Learning materials,
- Learning infrastructure

2) Core learning process

- Guidance/ training needs analysis and recruitment
- Learning design
- Learning delivery
- Evaluation of course and assessment of learners

3) Learning context

- Institutional setting
- Cultural setting
- Learning environment
- Legislation
- Financial settings
- Values system

There the other approaches considering both of the institutional level and the program level. According to the QA toolkit for distance higher education institutions and programs developed by Commonwealth of Learning (COL,2009; Jung, 2012), there are ten key inputs for quality in institutions and six key aspects for quality in program (Table 4.1). It is developed in collaboration with the Sri Lankan Ministry of Higher Education and UNESCO. It offers ten key quality aspects for institutional level and six for program level.

Table 4.1 *COL Quality Assurance Toolkit*

No	10 key inputs in institutions	6 key aspects in programs
1	Vision, mission and planning	Institutional planning and management
2	Management, organization culture and leadership	
3	Learners	
4	Human resource development	
5	Program design and development	Program design and development
6	Course design and development	Course design and development
7	Learner support and progression	Learner support and progression
8	Learner assessment and evaluation	Learner assessment and evaluation
9	Learning infrastructure and resources	Learning infrastructure and resources
10	Research, consultancy and extension services	

Source: COL Quality Assurance Toolkit (2009)

At the learners' perception, Jung (2012) investigated Asian learners' perceptions of quality in e-learning and proposed a QA framework of e-learning which is built on three domains (Figure 4.1). Firstly, environmental domain refers to contextual quality aspect creating teaching and learning environments which learners can study flexibly and productively. Secondly, educational domain is to develop learners' knowledge, skills, and attitudes both of independently and collaboratively. Thirdly, supportive domain is to assist three quality dimensions effectively and efficiently. Through detailed processes of the suggested process model, support measures for e-learning quality assurance have been drawn in three domain of Jung's quality assurance index for the ASEAN region; environmental, educational and supportive domain to implement a multinational e-learning system developed based on the suggested model.

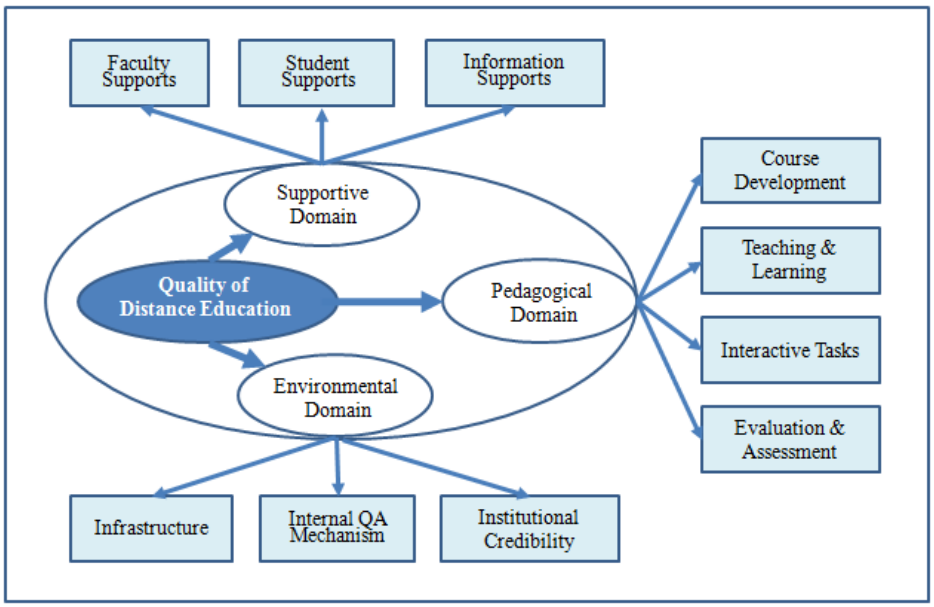

Figure 4.1 Jung's QA model for quality in e-learning
Source: Jung, 2012, p. 15

Jung's quality assurance index for the ASEAN region includes commonly required elements for e-learning quality assurance in both of UNIQUe and COL Quality Assurance Toolkit. It offers the assessment domain specialized for the context of the developing countries which is different from the one in the developed countries.

As it has been discussed, the assessment domain for e-learning quality assurance that are needed support in implementing multinational e-learning are summarized as below on the basis of Jung's quality assurance index for the ASEAN region (2012). Twenty key factors

for quality assurance of a multinational e-learning system are suggested in the assessment domains of Jung's quality assurance index for the ASEAN region. Those key factors are developed during designing a process model based on the analysis of current status and requests of participants from the developing countries. The assessment domains are summarized in related domains as follows.

1) Environmental domain: Institution's support for policies and infrastructure
2) Educational domain: Overall support for teaching and learning activities and for training related to e-learning course development and any other domains
3) Supportive domain: Support for information provision related to teaching and learning resources, technological assistance, and human resources

Design of a process model for a multinational e-learning system

This process model is to design and implement a multinational e-learning system to enhance online higher education programs for the developing countries and to activate international exchanges among the participating countries. Considering the lack of fund and the poor ICT infrastructure in the developing countries, an optimal outcome could be achieved with minimum investment and what's more, the model will highly reflect the opinions of each stakeholder in every steps of the process to develop the model so that different requests of the participating countries can be met.

A draft of the model for designing and implementing a multinational e-learning system is derived from the theories and principles of educational technology and the general components and processes of instructional design. The draft of the suggested process model consists of five stages; Clarification of goals and targets, Design by negotiation, Development, Implementation & Evaluation, and Reflection & Revision and specific processes for each stage (Figure 4.2). Each stage includes the collection of opinions from government officials and representatives of participating countries through action research, and the mediation of opinions. Through detailed processes of each stage, support measures have been drawn in three domain of e-learning quality assurance; environmental, educational and supportive domain to implement a multinational e-learning system developed based on the suggested model.

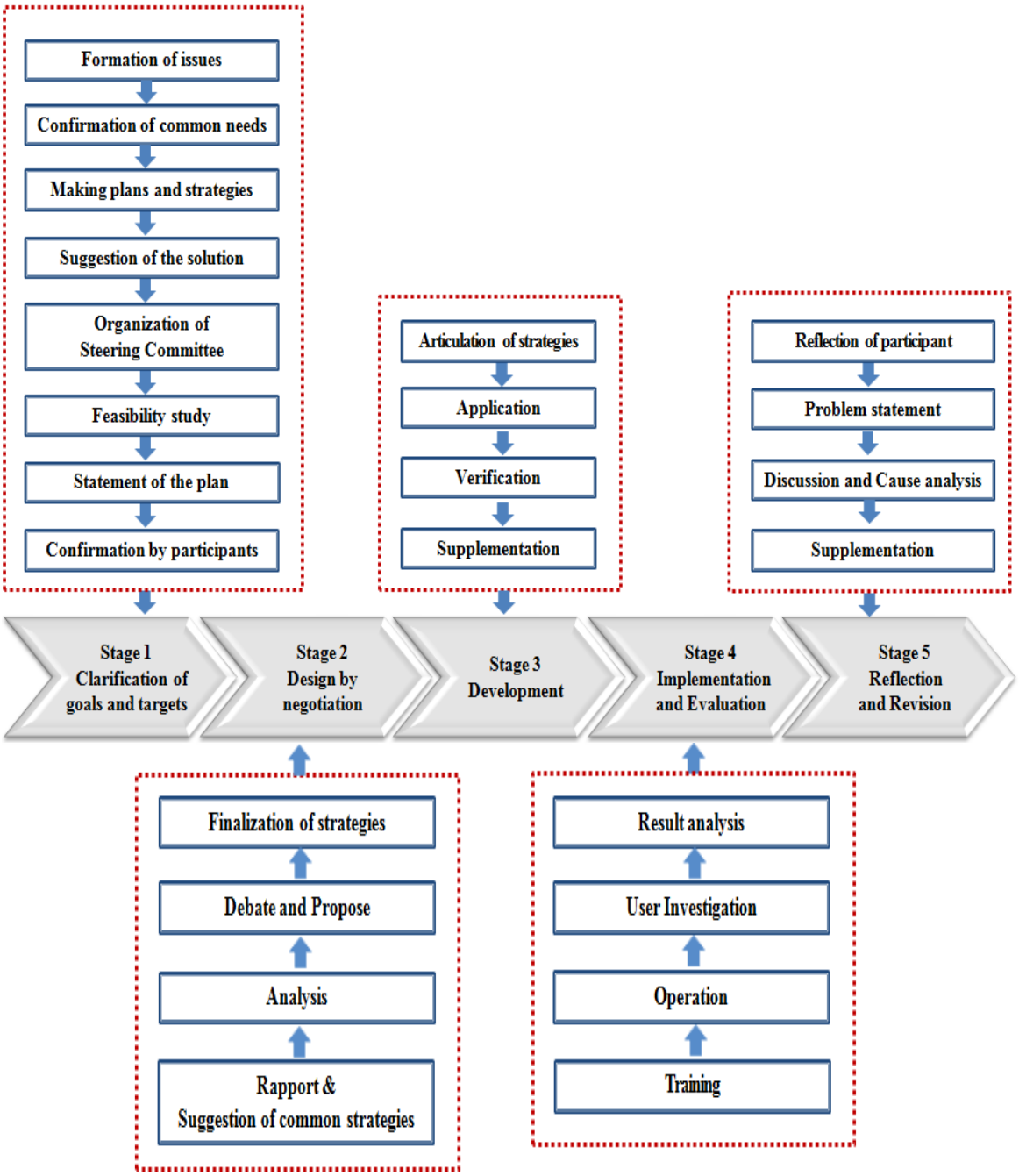

Figure 4.2 Draft of the 5- stage process model for multinational e-learning

Stage1. Clarification of goals and targets

Stage 1 is to investigate the purpose and the subject. As most of educational developments are carried out with public funds in the developing countries (UNESCO, 2012), a process of shaping policy agendas, usually takes place to initiate a discussion of using official aids. When issues are created and form a social consensus, they become official policy agendas for public discussions. Just like the topic of this thesis, when a policy agenda is not limited to issues of a country but encompasses the issues that are common in various countries, a

policy agendum of a country become a common policy agendum of various countries when the related countries want to find a solution for the common policy agendum together. The final plan will be drawn up through a feasibility study into the proposed strategies through negotiation and discussion.

Based on the progress of the ACU establishment project, which is the case study of this thesis, the steps of the Stage1, Figure 4.8 which is the first step in designing a multinational e-learning system have been drawn in order to investigate the research targets and goals (Figure 4.3). During ROK-ASEAN 20 years' commemorative summit held in Jeju, Korea in the month of June, 2009, the Secretary General of ASEAN, Mr. Surin, Pituswan proposed the establishment of a higher education institution in the ASEAN region via e-learning. In October of the same year, at ASEAN –ROK summit the Korean government accepted the secretary general's proposal and it was handed over to the Korean ministry of education, science and technology for a review. In November, 2009, the Korean government announced the review result at the 4th Senior Officials Meeting on Education, the ASEAN secretariat nominated AUN (ASEAN University Network) as the project coordinator for ASEAN. And at the 5th ASEAN Education ministers meeting held in Cebu, the Philippines in January 2010, specific plans and strategies were made based on the participation and support of the participating countries. The plans and strategies were supplemented and proposed to the participating countries in February 2010. In March of the same year, a feasibility study of the plans and strategies was carried out after forming a steering committee, which consists of a representative from each participating countries. And according to the study result, the plans were taken shape, and through the discussion and negotiation of the participants, the final plan was drawn along with the project's goals and targets.

Title	Detail	Procedure
• Jeju, Korea in June, 2009 : ROK-ASEAN 20 years' commemorative summit	• Surin, Pituswan, the Secretary of ASEAN proposed the establishment of ROK-ASEAN cyber university	Formation of issues
• Cha-an Hua Hin Thailand in October, 2009: The 12th ASEAN-ROK summit	• Korea agreed to the proposal of the ASEAN secretariat. The MEST agrees to review the proposal.	Confirmation of common needs
• Bangkok, Thailand in November, 2009: the 4th Senior Officials Meeting on Education	• The MEST presented the establishment of ASEAN Cyber University in the meeting agenda. • The ASEAN secretariat nominated AUN as the project coordinator	
• Cebu, Philippines in January, 2010: the 5th ASEAN Education ministers meeting	• Commitment for the support and requests of participating countries	Making plans and strategies
• MEST in Korea in February, 2010	• The MEST created a project plan	Suggestion of the solution
• Port Dickson, Malaysia in March, 2010: the 2nd AUN rectors' meeting	• Senior policy advisory committee consisted of the participating countries was proposed.	Organization of Steering Committee
• Chulalongkorn University, Thailand, on July 2nd, 2010 • Yogyakarta, Indonesia on July 29th and 30th 2010 • Seoul, Korea on August 3rd 2010 • CLMV in September ~ November 2010	• Special meeting of the senior policy advisory committee • Special meeting of the advisors at the 26th AUN-BOT meeting • Cooperation consolation between AUN and MEST • Visit to the participating countries for feasibility study	Feasibility study
• Seoul, Korea on January 17th ~ 21st: Senior Official Meeting for ROK-ASEAN cyber university establishment	• Sharing of the tentative master plan and the participants' consent	Statement of the plan
• February, 2011	• Discussing the details and possible improvements of the tentative plan made by AUN and the ASEAN secretariat	Confirmation by participants
• CLMV on July 4th, 2011	• Conducting a survey on the participating universities • Conducting a survey of ICT and e-learning on 26 member universities of AUN	

Figure 4.3 Procedure to clarify goals and targets

Source: AUN (2011). Cooperation in higher education between the ROK and ASEAN, AUN; KEDI (2011), pp.19-22

Based on the progress that has been made in Figure 4.3 above, Stage1, which is to clarify goals and targets, investigated the purpose and the subject is as following (Figure 4.4).

Figure 4.4 Stage 1. Clarification of goals and targets

The participating countries need national policies in order to resolve the issues in their countries. Some of the issues, which need policy support, are shared by the participating countries that they need to be solve as the common issues among them. Through the discussion, the participating countries set up a plan and strategies to solve the issues and arrive at a solution. They then form a steering committee to solve their common issues. They conduct a feasibility study of the agreed plan, from the study result they draw up the final plan. The final plan will be reconfirmed by the participating countries, and the final goals and targets will be settled.

Stage 2.Design by negotiation

When an issue is related to various parties, negotiations are needed to mediate the participants' opinions and reach a consensus for the multinational e-learning system development based on the multilateral participation and agreement. As a method to mediate and negotiate the participants' opinions for the ID model design, RADPAC Negotiation model is used as a method to negotiate and mediate the participants' opinions, in the order of "Rapport, Analysis, Debate, Propose, Agreement and Close". As it has already mentioned in Chapter 3, the ACU project steering committee, which is composed of one government official and a university representative from each participating country, is formed based on the demands and views of the participating countries to implement multinational e-learning. In the step for 'Rapport & Suggestion of common strategies', the participants introduce each other and share the general plan proposed from the result of Stage 1, before starting the full-scale discussion. The 'Analysis' is a step where the participants explain the current status and the requests of their home countries, and understand by analyzing the requests of one another, in order to reflect the requests of their countries to the final plan as much as possible. In the 'Debate and Propose' step, the negotiations are carried out through proposals, discussions, and negotiation. In the 'Finalization of strategies' step, the final plan is made by closing debate and negotiations (Figure 4.5)

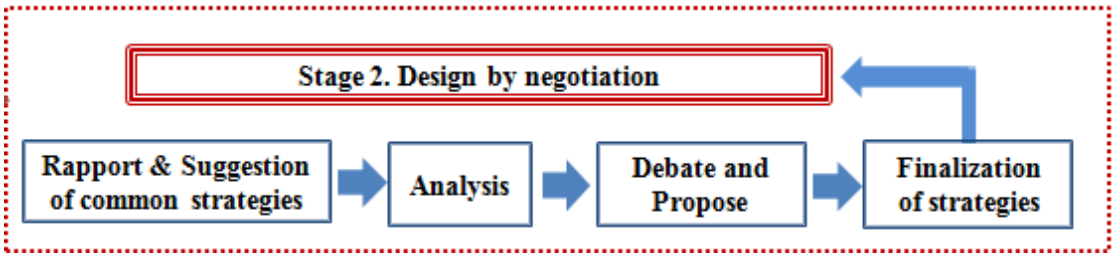

Figure 4.5 Stage 2. Design by negotiation

As it has been proposed in Figure 4.5, the participants discussed the issues in the environmental, educational and supportive areas, which are needed to assure e-learning quality during the implementation of the multinational e-learning system developed based on the suggested process model in this thesis. According to the above stage progress flow on the Figure 4.5, the design by negotiation and discussion was made for three times of meetings of the ACU Steering committee on the 22nd of March and on the 15th of August, 2012 in Hanoi, Vietnam and on the 14th to 16th of November, 2012 in Bangkok, Thailand.

Discussed agenda in the three domains are suggested for development of a multinational e-learning system and proposed its necessary components by participants from initial participating countries and universities. Based on the process suggested for the Stage1, these agenda are discussed to make a negotiation for the final strategies.

Environmental domain - Institution's support for policies and infrastructure

Operation methodology of multinational e-learning system; selecting a methodology among A, B, C. As the first step at the stage2; suggestion of common strategies, three operation types are suggested to operate a multinational e-learning system for the ACU project. Firstly, type A is sharing of e-learning contents. In the Type A, participating universities keep their own academic systems and calendars but share e-learning contents through LCMS[21] of the multinational e-learning system. With the method of mutual distribution of content sources, participating universities are not restrained by the administrative and technical aspects resulted from the credit transfer. The operating fund for the management of a secretariat and incentives to universities actively participating can be raised by charging the universities for the e-learning contents download (Part of a course can be view for free). There is a need for the LCMS based on the e-learning standardization and a module for content viewing. Secondly, the Type B is a central management method. The multinational e-learning system is managed according to the academic calendar and standards designated by the secretariat, and credits are recognized when students submit a credit accreditation certificate issued by the secretariat to their home university. The secretariat rents, manages and stores the e-learning contents and does not disclose the content sources to the participating universities. Universities where credits are transferable pay for the tuition in the proportion of enrolled students to the total number of students and receive rents for their contents, which they lent, from the secretariat. This operational mechanism motivates the universities to continue with the credit transfer system, and moreover, the secretariat can create revenues from a multinational e-learning system which allows the general public to audit courses. Thirdly, the Type C is a university syndicate method. Students can directly take e-learning courses, according to their needs, from the participating universities. Since the universities have different academic calendars and grading systems, there is a concern with student complaints and a possible loss of university administrative costs. It is almost impossible to integrate the academic systems

[21] LMS: Learning Content Management System

with the multinational e-learning system, and so is the data standardization. It is a rather difficult structure with which the secretariat can gather the development requests of the universities and arrive at an agreement.

At the second step of the Stage2, operational characteristics of four participating universities are analyzed to choose one of the suggested operation types. Four participating universities have differences from one month to three months on their academic calendar (Table 4.2), different grading systems (e.g. scores, assessment methods (absolute / relative), different management systems (Programming language, local language, university organization) and different tuitions, requiring continuous operating costs.

Table 4.2 *Academic Calendar of Initial Participating Four Countries*

Country	Terms	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC
Cambodia	Semester 1												
	Semester 2												
Laos	Semester 1												
	Semester 2												
Myanmar	Semester 1												
	Semester 2												
Vietnam	Semester 1												
	Semester 2												
ACU (Suggested)	Semester 1									Start			End
	Semester 2												

At the third step of the Stage2, participants debated and suggested alternatives to determine the final strategies. Due to the lack of experience in e-learning management and experience, the participating universities prefer the central management method by the secretariat. The Secretariat suggested to operate the multinational e-learning system based on the ACU calendar which period is decided based on the negotiation by participants. Issues with regarding the different tuitions were discussed in the e-learning revitalization stage. The secretariat would bear the cost of labor for the e-learning management and offer educational opportunities such as e-learning workshops, conferences, lecture orientation and training programs.

At the final step of the Stage2, as a result of the negotiations, the operation strategies are finalized as following. Entire learning process and academic affairs are managed by the academic calendar and standards set out by the secretariat, through the centralized system. Students earn credits by submitting “Credit Accreditation Certificates” issued by the

secretariat to their home universities.

E-learning courses for credit transfer (MEST, 2012b). As a suggestion for the common strategy, the analysis data on the participating universities' e-learning courses are provided while conducting analysis to select the study areas**,** offering a list of major and required courses to select courses for development, and conducting a survey to find desired courses. In the analysis step, a preference survey was conducted to collect the participants' preferences on major area. There were similarities and differences in the preferred major areas between governments and universities as shown in Table 4.3. There were also different preferences for areas of study and desired courses for development.

Table 4.3 *Preferences Analysis on Major Areas*

Country	Organization	Preferences in Major Area
Cambodia	Government	Management, IT, Engineering, Agriculture
	University	Korean, English, Special lecture by Korean professional in Engineering
Laos	Government	Technology and IT
	University	Management, Computer & Engineering, Agriculture, Economics, Tourism, Korean, English, Foreign languages
Myanmar	Government	To take a role of e-learning Hub in Myanmar
	University	Computer & Engineering, English, Foreign languages
Vietnam	Government	Human resource development programs, Co-development
	University	Conversion of traditional off-line courses to e-learning courses, Korean, English

Source: MEST, 2011, p.21

A number of e-learning courses for content development are also limited because of the limited resources such as time and financial resources. According to the limitation of the budget, only about twelve e-learning courses could be supported to be developed. Possibility of availing their manpower to participate in the development and management process was also considered to choose e-learning courses for development. It showed the areas of study that the participating countries wish to offer as ACU e-learning courses (Attachment 1). All four participating countries requested to open e-learning courses in IT

and English. As for Korean and engineering, three participating countries wished to include them in the e-learning courses, while only two participating countries opted to offer e-learning courses in the subjects such as business, agriculture and foreign languages.

A preference survey on e-learning courses was conducted to select major area which all the participating universities would like to offer and prefer to develop. Participants discussed to select twelve e-learning contents to develop. Participants had different preferences on e-learning courses and its major area but every course could not be chosen as joint educational programs. Because of this, the participants had to select the courses where there was available manpower for the development and management. When managing the developed courses, the participating universities were asked whether they would need co-instructors and teaching assistants (Attachment 2). When it was difficult for the participating university to find local co-instructors, it was arranged through a meeting of the steering committee for the university to get help from the other participating universities to utilize their co-instructors.

Twelve courses in five areas were made to the final list of the e-learning courses, which the participants agreed to develop (Attachment 2). They are in five areas of study: business, language, engineering, Korean language and the certificate course. One of the most noticeable things is that five out of twelve e-learning courses are in engineering, which reflects the characteristics of three engineering universities out of the four participating universities (Attachment 2).

Credit transfer methodology (MEST, 2012b). As the first step at the stage 2, when there is a difference between the credits awarded by the ACU joint educational programs and the credits of the participating universities, it is suggested as common strategies that the ACU credits are recognized as it is. Aside from the ACU credits, the credits are awarded by the participating universities will be recognized on their own terms. When there is a difference between the credits awarded by the ACU joint educational programs and the credits of the participating universities, the credits are recognized according to the way the participating universities award their credits. It is need for MOUs among governments and universities.

At the second step of the Stage 2; analysis, related to this matter, several issues are analyzed. Different credits are awarded for the same course in different countries. They

have different academic calendars in different countries. According to the universities' regulations, students can take courses that meet their credit requirements. This may resolve the universities' different credit systems; however it is difficult as different instructional designs are used in developing the courses for various credit courses and levels.

At the third step of the Stage 2; debate and propose, it is debated and suggested that more weight should be given to the ACU credits but the credits would be calculated based on each university's credit system. This can help to solve the problem of different credit systems but when students take the ACU joint educational programs, they should be aware of the credits of their registered courses at their home universities. When the participating universities keep their different credit systems, more difficulties are expected when more universities join in. It is recommended to recognize the credits awarded in the ACU joint educational programs, yet the final decision should be left to the universities whether to adopt it or not.

At the final step of the Stage 2; finalization of strategies, when the participating universities decide to use the multinational e-learning system for credit transfer, there should be guidelines for credit recognition (MEST, 2012d). Credit hours of ACU courses should be commonly accepted to all of participating universities, however also accepted based on home institution's credit accreditation policy. Registration record is documented and stored up in Hub, also provided to any universities upon its request.

Participating universities (MEST, 2012b). As the first step at the stage2; suggestion of common strategies, universities that signed the academic exchange agreement with the ASEAN member states and participating universities and have been actively conducting academic exchanges can join. Universities which are a part of the Korean e-learning center operation in ten ASEAN countries and universities or higher education universities that agree with the ACU management policies and signed the MOU with their respective government can join. Universities that wish to take a part in developing e-learning courses that have been approved by the committee or wish to offer their developed e-learning courses can join as participating universities. Universities that wish to take a part in the development of ACU joint educational programs and wish to offer their existing contents can join but they should be approved by the committee and whose membership should be secured with the MOU.

At the second step of the Stage 2; analysis, differences are analyzed on the level of academic achievement of universities which wish to participate in. The academic level of universities applying for joining on the multinational e-learning should be are verified. At the third step of the Stage 2; debate and propose, to select participating university, operational regulations should be settled such as standards and processes for the e-learning quality assurance with regard to the selection and for development and management of ACU educational programs.

At the final step of the Stage 2; finalization of strategies, the membership of new universities should be approved with the unanimous consent of the participating universities. After screening the application documents of universities that wish to join ACU, when the committee comes to a unanimous consent, the new universities are granted membership. Through the publication of ACU quality assurance guide, the quality of ACU joint educational programs is assured. By managing the educational quality in this way, it encourages the active participation of universities in the e-learning quality.

Steering Committee (MEST, 2012b). As the first step at the stage 2; suggestion of common strategies, it is suggested to be composed of government officials and university representatives of the participating countries, representatives of participating universities and a member from AUN with the executive appointment of one-year tenure for a chairperson and a secretary.

At the second step of the Stage 2; analysis, committee members meet twice a year to discuss agendas. Members should bear the travel expenses to attend the meetings. However, whether or not to provide travel subsidies to the members should be further discussed with the secretariat. Members have rights to take a part in and vote with regard to the ACU management agendas. At the third step of the Stage 2; debate and propose, it is discussed that there is a need for alternatives when there is a need to organize meetings, other than the official meetings. At the final step of the Stage 2; finalization of strategies, upon the request of members, the secretariat can call meetings, which are other than the official committee meetings. Unofficial meetings can be held via video conferencing. Upon the request of the participating universities, meetings, which are other than the official meetings, can be organized. At least one month prior to the meeting date, the meeting

agenda should be shared among the members.

Facilities. According to the Facilities Criteria of MEST of ROK, there is a standard and requirements for the establishment of a cyber university in ROK. Each facilitates criteria should be settled and satisfied to the standard and requirements. According to the Facilities Criteria of MEST of ROK (Attachment 3), there is a standard and requirements for the establishment of a cyber university in ROK. There should be at least one teaching faculty and one TA per two hundred students. There is a minimum requirement for Campus facilities such as ICT equipment and campus sizes (Attachment 3). There is a minimum requirement of servers and network equipment which clarifies the basic and additional requirement for the extension of installation based on the increase of a student number.

Every cyber university in Korea satisfies the above equipment capacity standards. The equipment capacity rate exceeds from a minimum of 110% to a maximum of 5,520%, with an average of 590% (KERIS, 2012, p.34). There is a gap in the status of ICT infrastructure between developed countries and developing countries. Since the e-learning contents are being developed at the moment, they are not yet verified. Moreover, as many students do not have e-learning experience, there is no guarantee that how many students would register. During the test period of multinational e-learning, it is prudent to involve a minimum number of students and gradually expand according to the test results. Considering the ICT development and the infrastructure status in the ASEAN region, the participating countries do not need to satisfy the equipment capacity standards of Korea. Nonetheless, as shown in the following table the minimum requirements of servers and network specifications for e-learning according to the number of students should be met. According to the specifications of facilities for online education in Korea (Attachment3), the minimum equipment capacity requirements for online education per number of students are given in Table 4.4. It clarifies the specifications of facilities such as a server, a memory and a storage disk which are required to be extended based on the increase of student numbers.

Table 4.4 *Standard of Servers and Network Equipment*

Equipment		Basic requirement (Less than 1,000 people)			Additional equipment (Per 1,000 people)		
		CPU	Memory [MB]	Disk [GB]	CPU	Memory [MB]	Disk [GB]
OLTP Server [tpmC]	DB for educational administration	7,500	2,048	400	7,500	256	300
	Lecture DB	15,000	2,048	400	15,000	512	300
	Backup DB	12,000	2,048	2,500	12,000	512	2,500
WEB/ WAS Server [OPS]	WEB Server	1,000	2,048	300	1,000	256	200
	Mail Server	500	2,048	150	500	128	115
	Media Server	3,000	2,048	900	3,000	512	800
	Server for educational administration	1,500	2,048	300	1,500	256	10
Network	Intranet	Gigabit Ethernet or over					
	Internet	64Mbps			64Mbps		

Source: MEST, 2008

Table 4.5 shows the minimum requirements and the required specifications of computer for e-learning such as PC operating system, CPU, Memory, and Browser.

Table 4.5 *Minimum Requirements and Required Computer Specification*

Facility		Minimum	Requirement
PC	OS	Window98	Over Window XP
	CPU	Pentium3	Over Pentium4
	Memory	256MB	Over 512MB
	Browser	I.E 5.5	Over I.E 6.0
Network		Over 256KB	Over 512KB

Source: MEST, 2011, p. 15

Facilities in a hub center, whose equipment was installed with reference to the above specifications. The workstations of the staff at the hub center are operation offices and a hub-center control room, while e-learning contents are developed in a content development & research office. Various servers are located in a server room, and the required equipment for each work is installed according to the specifications in Attachment 4.

Educational domain - Overall support for e-learning course development and teaching and learning activities

Trainings the manpower involved in developing educational programs. Training programs for instructional designers, programmers, network administrators Training programs were held in Korea: Training program for managers (2 from each participating country, one week, Dec.19~23, 2011), Training program for system administrators (1 from each participating country, one week, Feb.5~11, 2012), Training program for content developers (3 from each participating country, 3 weeks, Feb.5~25, 2012) (MEST, 2012), - Training programs were conducted in English, along with practicum. For the successful development, a one-off training program is meaningless. Hence, there should be continuous support and training. In the case of training programs overseas, trainees can be different from the people in charge as government officials are sometimes sent out according to seniority. Though the English proficiency of trainees was a must, yet due to the language barrier the effect of training could not be measured. There should be a way to have the actual people in charge take part in the training. Then, teaching assistants and translators will be needed. It is needed a way to continue responding to the trainees' questions and training. The secretariat should be able to select trainees from the participating countries so that the actual people in charge of development can take part in the training. With use of teaching assistants and translators, communication during lessons can be supported. By securing the communication channels between developers belonging to the secretariat and trainees, there will be continuous trainings and Q&A sessions. An assessment should be conducted after the training program in order to prepare measures to improve the training effects. Training programs can be held in the participating countries in future.

Appointing universities (MEST, 2012a) and an advisory committee (MEST, 2012e) for main collaboration. Cyber universities that have a long history of e-learning operation are appointed for main collaboration so that they can pass on the e-learning management know-how and carry out the actual project. Creating task-force teams in these universities to be in charge of carrying out the overall project is necessary. Apart from this, an advisory committee consisting of experts in the project area should be made since there is a need to verify the project feasibility with expert knowledge and know-how. Appointing the advisory committee with experts is necessary. They can contribute to the successful performance of the project with their professional knowledge and know-how. Appointing experts in the following five areas to the advisory committee is necessary for the project so that can proceed while reflecting the opinions of expert groups and improve feasibility

with their specialty (Table 4.6)

Table 4.6 *Project Consultant Group*

Area	Role
General advice	• Overall management and schedule of the ACU project
Curriculum development and management	• Advice on designing the ACU educational programs • Advice on content development and management of the ACU educational programs
Development of credit transfer system	• Advice on developing an integrated management system for credit transfer • Advice on establishing policies for the ACU credit exchange
E-learning quality assurance	• Advice on setting the standards for e-learning management and content quality assurance, and assessments
Strategic planning	• Advice on making strategic plans of the project

Source: MEST, 2012e, p. 4

Passing on the method of e-learning content development. It is required to provide a manual that contains steps for the e-learning content development. Providing the programming scripts to developers could be a way. Content developers wishes to have educational resources in the form of multimedia along with the written manual. They prefer to have the manual in local languages for the sake of convenience. They would like to have continuous training, rather than a one-off training program. It is suggested to provide video or flash educational resources along with the manual. Due to the limited human resources, it will be difficult to translate the manual into local languages. The translation should be done in their respective countries but the secretariat will make provision for the participating countries to receive the training to use the video educational resources. For the final strategies, videotapes the training and development programs and offer them as educational resources. It secures the communication channels among the developers and responding to their Q&A.

Support domain - Support related to teaching & learning resources, technology and human resource

Education and training for instructors, learners and administrators. By initiating training programs for e-learning concepts and instructional strategies, participants that lack e-learning experiences can better understand e-learning and become motivated. An orientation in LMS use and course registration and a training program in course management, attendance and assessment can offer convenience to learners and enhance learning effectiveness. There is a need to conduct a training program for instructors, learners and administrators with regard to LMS use. Instructors who never taught or managed course through e-learning may not be familiar with the instructional strategies which can enhance learning effectiveness through e-learning. Since the instructors may manage the e-learning contents developed by other instructors, they should be prepared how to handle students' questions. There should be test and pilot programs until the instructors and the administrators are familiar with the system. During the pilot operation, issues can arise from unexpected errors and inexperienced management. There should be measures to resolve them. The LMS training program should be differentiated according to the roles and authorities of its users: instructors, learners and administrators. A training program in e-learning instructional strategies should be offered to instructors that lack the experience of managing courses via e-learning. When the instructors are using the e-learning contents developed by other instructors, advice will be offered to them through a communication channel between subject matter experts and co-instructors so that they will be able to respond to possible questions. Therefore, workshops in LMS use for instructors, learners and administrators is required A training program in e-learning instructional strategies will be offered to instructors that lack the experience of course management through e-learning. When the instructors are using the e-learning contents developed by other instructors, advice will be offered to them through a communication channel between subject matter experts and co-instructors so that they will be able to respond to possible questions. Test and pilot programs will be encouraged and offered until they become familiarized with the LMS. A manual for lecture preparation such as a check-list or a management scenario will be distributed so that instructors can check on the preparation of a course and when issues arise, they can respond appropriately.

LMS and language support of e-learning contents. The participating countries have different languages but the majority of them use English. Hence, e-learning contents and an LMS of the multinational e-learning system will be developed in English. In spite of English being the official language, there is a concern that learners that are not familiar

with e-learning are to study in English, not in their native tongues. The translation into local languages should be supported. Though the contents are developed in English, a support measure to translate the contents into the local languages for the countries that requested such support should be sought. Since courses will be managed by the local co-instructors, students will be able to get the lecture explained in their local languages with the e-learning contents developed in English. For the reason, with the e-learning contents developed and the LMS developed in English, the contents will be provided with subtitles. The subtitles for the e-learning contents will be provided to the countries that requested the content translation.

Summary

Stage 2 is the stage where the final plan is developed through the negotiation and discussion of the participating countries. The first step in the process is to propose an initial project plan and when the participating countries made their positions in the project, they go through a process of analyzing each other's requests before actual negotiations. In order to reflect their country's requests on the final plan, the participating countries discuss and negotiated. Lastly, with the consensus of the participating countries, the final plan has been drawn up. Stage 2 has seen the disparities among the participating countries with regard to university academic calendars, national holidays, evaluation methods, languages, curriculum, in-security of online assessment, Internet use, and unstable network connection (Table 4.7).

Table 4.7 *Issues for Debate and Negotiation*

Issues for debate and negotiation	Country			
	A	B	C	D
Different length of one semester	✓	✓	✓	✓
Different holidays of each country	✓	✓	✓	✓
Different academic calendar	✓	✓	✓	✓
Different learning style and evaluation criteria		✓		✓
Language barrier	✓		✓	
Context of learning materials		✓		✓
Mistrust of online Examinations	✓	✓	✓	✓
Different local price to pay financial incentives				✓
Necessity of computer Lab. with Internet connection		✓	✓	
Limitation of Network speed	✓	✓	✓	

To solve the problems above, a multinational e-learning system is finalized to apply to the ACU project based on the result of the participants' discussions and negotiations for Stage 2. The followings paragraph shows specific strategies which the participants arrived at in order to resolve the issues in the table above while aiming to establish a multinational e-learning system, which meets the demand and supply of users, with the understanding of the issues of the multinational e-learning implementation in the developing world.

The multinational e-learning system of the ACU project is implemented based on the centralized operation methods according to the ACU guidelines. Since each participating university has a different academic calendar, the participating universities will adhere to the ACU academic calendar to take part in e-learning at ACU. The ACU credits should be recognized at the participating universities, nonetheless, the final weight of the credits will be according to the university guidelines of the participating universities. The secretariat will be formed with agreement by the Steering Committee and it will carry out the project according to the project plan. The advisory committee will discuss the ACU project operations and give validity to the project after collecting the opinions of experts in each domain. Through meetings of the steering committee called the ACU Steering Committee, the opinions of the participants are gathered and they discuss the specific plans for the ACU project operation. E-learning programs are designed, developed and offered in consideration of the common demands of the participating countries. Among the management expenses for e-learning, the labor cost of professors in charge of development and implementation, and teaching assistants will be borne by the secretariat. Guidelines for credit transfer should be made so that the participating countries can share one another's academic credits. Memorandums of understanding with governments and universities should be in place in order to agree to and support the ACU project operations. Selection criteria of participating countries should be drawn and the membership should be given to new universities by the unanimous consent of the participating universities. Guidelines for e-learning quality assurance should be prepared to guarantee the quality of e-learning such as the design, development, and management of e-learning programs. By analyzing and assessing the e-learning readiness of the participating countries, measures can be drawn to meet the minimum standards of e-learning quality assurance. The Secretariat gives technical support for the LMS management to the participating countries. The Secretariat offers training programs to e-learning professionals (instructional designers, programmers, studio experts). The Secretariat offers orientations and workshops to e-learners (instructors,

students, administrators). The Secretariat hosts e-learning conferences to reinforce e-learning and publicize the project. The Secretariat offers continued training and securing a channel for Q&A. The Secretariat supports the participating universities and the advisory committee to gain professional knowledge and know-how in the related domains. Offering educational resources, manuals and guides in professional areas such as design, development, and management of e-learning programs through the secretariat. By securing a communication channel between the professor in charge of development and the professors in charge of delivery, there can be active Q&A sessions. By distributing or using the trouble-shooting manual or lecture checklists, instructors can be well prepared and respond to the eventualities properly. Teaching assistants are assigned to support students in the lecture management.

Stage3. Development. It is a stage to develop a multinational e-learning system composed of the multinational e-learning key factors (Figure 4.6) as mentioned in the previous stage. In 'Articulation of strategies', the purpose and the plan are explained to the participants in detail so that the system under development would correspond with the development purpose. In 'Application', necessary key factors are added to the system. In the 'Verification' step, the final product was verified after comparing it against the original development design. In 'Supplementation' the areas of the system that needed modifying were supplemented.

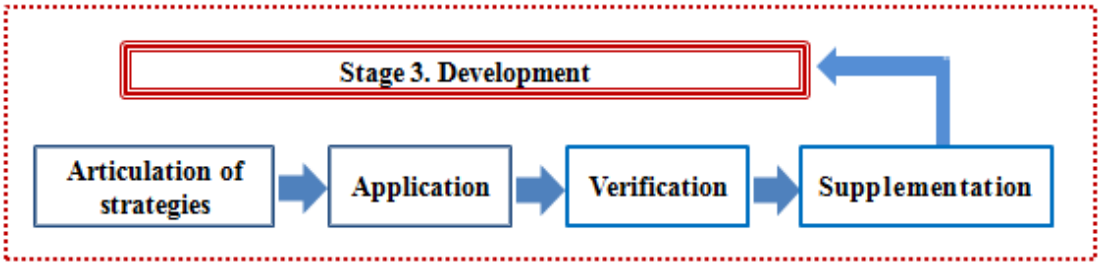

Figure 4.6 Stage 3.Development

The following is a summary of the requested modifications to the development plan of the multinational e-learning system, which had been drawn up in Stage 2, proposed at the extraordinary meeting of the ACU steering committee in Hanoi, Vietnam on August 15th, 2012 (MEST, 2012f) and the 2nd ACU steering committee meeting on November 16th, 2012. While the participants were discussing to develop an instructional model for multinational e-learning, it is found out that the participating countries are facing similar or different issues as mentioned on Table 4.7.

Table 4.8 shows specific strategies which the participants arrived at in order to resolve the issues presented in Table 4.7.

Table 4.8 *Specific Strategies to Resolve Common Issues*

Issues	Specific strategies to resolve
Different length of one semester	15 weeks per one semester
Different holidays of each country Different academic calendar	- Individual operation based on different academic calendar of each participating university - Allowing a two-weeks period to take a lesson
Different learning style and evaluation criteria among participating universities	Giving flexibility within ACU guidelines - Co-instructors receive a manual for course management and evaluation criteria from SME, but the ultimate responsibility of course management is entrusted to co-instructors in the range of SME guideline
Language barrier	- Class operation in own language - Subtitles will be offered to the countries that recommended local translators for the content translation (Translation costs will be covered)
Context of learning materials	- Major areas based on common demands - Since the courses in political science, culture and so on will be excluded from the joint educational program since the participating countries have different stances on these areas.
Mistrust of online Examinations	- Offline exams for Mid-term and the final - As it will be difficult to monitor cheating in online exams, the online exam will be excluded from the assessment for the time being.
Different local price to pay financial incentives	- Assistance with consideration of local price and attendance rate on e-learning
Necessity of computer Lab. with Internet connection	- Arrangement of Lab. schedule for class - E-learning will take place in close liaison with satellite learning centers.
Limitation of Network speed	- Options to choose bit rates for AV lecture streaming (Audio, 56Kbyte, 300 Kbyte) - A function with which students can find the server, which is the closest to them, and use the e-learning contents will be added to the LMS.

It aims to establish a multinational e-learning system, which meets the demand and supply of users, with the understanding of the issues of the multinational e-learning implementation in the developing world. Specific strategies to resolve common issues as seen in Table 4.8 can support quality assurance of the multinational e-learning system.

Environmental Domain

There have been issues raised to supplement the system model in the environmental domain. E-learning management guidelines and policies need to be approved by the participating governments. Troublesome e-learning management due to different academic calendars should be resolved with the joint ACU academic calendar through a discussion to reach an academic calendar agreeable to all the participants. Moreover, measures need to be prepared for e-learning quality assurance and to promote the e-learning awareness.

Through the discussion, a few solutions have been proposed. E-learning awareness can be promoted through conferences on e-learning guidelines and quality assurance. There should be an agreement on credit transfer by participating universities and measures to support the development of e-learning programs that have the common demand of the participating universities (a total of twelve (12) e-learning contents). Cost of managing three courses will be provided to the participating universities that offer them in their curriculum.

Each participating university should offer at least one course for credit transfer. One professor should take up between fifty (50) to two hundreds (200) students in his or her credit or non-credit courses during the pilot operation. Since a huge amount of money would go into translating the contents into local languages, there will not be support for local language subtitles. In order to resolve the confusion caused by language barriers and different academic calendars, the participating universities would not follow the ACU academic calendar during the pilot operation in 2012, and agreed to manage the e-learning courses with their university staff. The ACU credits will be awarded through absolute evaluations. The contracts should include SME, professors in charge of management, and TA's role description. The registration of ACU courses will be done at each university. In principle, ACU adopts the form of absolute evaluation. At the 1st meeting of the steering committee, the committee members agreed that the ACU students would not sit for the

mid-term or final exams. However for the fair and just evaluation, the offline exams have been proposed. The participating universities should support the manpower, facilities and systems needed for such measure. To solve the limitations of network speed, Internet access and computer use, there should be multimedia lecture rooms like offline lecture halls where students can come and take online lectures. Memorandums of understanding should be signed by the participating countries and the participating universities.

Educational Domain

There have been issues raised to supplement the system model in the educational domain. There were concerns of potential problems due to the lack of e-learning experience and system management. Separate workshops for participating universities were required due to different academic calendars.

Through the discussion, a few solutions have been proposed. The ACU secretariat holds workshops for the students and staff of the participating universities. When a participating university requests for a workshop, it will make a workshop plan together with the university officials. The experts from Korea will visit the participating university and conduct the workshop. If the participating university wants to hold a separate workshop, it should inform the secretariat of the possible dates. If there is no need for the workshop, manuals such as video clips will be used. The participants agreed to hold e-learning conferences on the regulations and laws of e-learning quality assurance and cyber university management. The year 2012 was chosen for the pilot operation so that the full-scale operation will be successful from the experience of the pilot operation.

Supportive Domain

There have been issues raised to supplement the system model in the supportive domain. There were concerns of LMS errors, unskilled management, language barrier and difficulty in managing the course developed by other professors. When the universities in the ASEAN region are in session, universities in Korea are close for summer vacation.

Through the discussion, a few solutions have been proposed. When the SME or the professors in charge of course management do not coincide, the professor that developed the courses should help the professors in charge of course management with Q&A. Even during summer vacations in Korea, support should be given to the participating universities

so that the e-learning activities will be carried out with any problem. If separate workshops are need to be held due to different academic calendars of the participating universities, the participating universities should inform the secretariat of the available dates for the workshop. The manuals and simulations videos for students, professors and staff will be provided to the participating universities. Local professors of the participating universities should manage the e-learning courses and they can solve the language barrier.

Stage4 Implementation and Evaluation. In 'Training', there were training sessions to use the developed system. After enough training had been conducted, the full-scale operation was underway during 'Operation'. After the full-scale operation, a user satisfaction survey was conducted on the system users in the 'User investigation' step. And through the 'Result analysis' step, functions of the developed system were assessed (Figure 4.7).

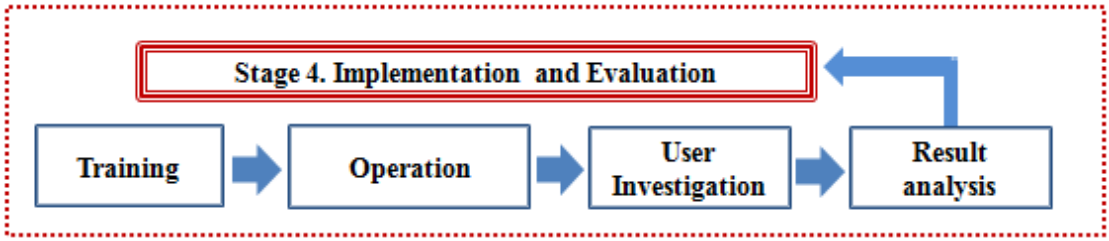

Figure 4.7 Stage 4. Implementation and evaluation

Stage 5 is reflection and revision. During the stage, the system users' opinions are reflected and the system will be modified and enhanced. The problems and issues raised by the users will be compiled and encapsulated. Through discussions, causes of such problems will be analyzed and the developers will go back to the stage to fix the problems and to enhance the system (Figure 4.8).

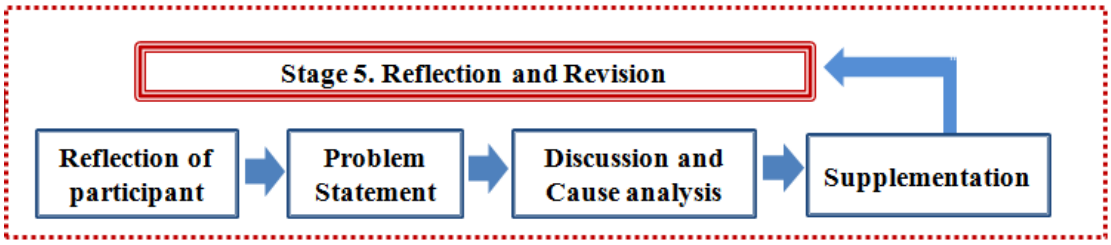

Figure 4.8 Stage 5. Reflection and revision

In 'Reflection of participant', the user experience of multinational e-learning systems was gathered. And in 'Problem statement', real management and improvement were sought while investigating the problem areas. Discussions were held in 'Discussion and Cause

analysis' to seek the causes and the solutions of the issues. In 'Supplementation', the system was rectified and modified based on the result of discussions.

Through the step-by-step process and discussions, the instructional design for a multinational e-learning system, which has been discussed above, can be summarized into five stages; Stage 1; Clarification of goals and targets, Stage 2; Design by negotiation, Stage 3; Development, Stage 4; Implementation and evaluation, and Stage 5; Reflection and revision. Each stage can be further divided into detailed steps.

The following Table 4.9 shows the key factors in the environmental, educational and supportive domains that need to be installed in a multinational e-learning system (Table 4.8). While developing the model, twenty (20) key factors that need to be considered in the environmental, educational and supportive domains are summarized as below.

Table 4.9 *Key Factors of Multinational E-learning System*

Component	
Environmental Domain	1) Securing the physical space and network speed for e-learning
	2) E-learning reinforcement and its publicity
	3) Selecting and developing joint educational programs for credit transfer
	4) Credit transfer policy among participating universities
	5) Credit transfer with the use of network systems and the Internet among participating universities
	6) Policy support on agreement
	7) Operation of the steering committee
	8) Selecting and managing expert groups that passed down e-learning knowhow
	9) Selecting participating universities
	10) Obtaining outstanding manpower in development and management of e-learning
Educational Domain	11) Method and process of e-learning content development
	12) Training on the e-learning concept and effective learning methods
	13) Training of the e-learning program developers
	14) LMS training for e-learning users
	15) Training on e-learning course management and teaching and learning strategies
	16) Training on online assignment submission and its evaluation

Supportive Domain	17) Technical support for professors, learners and administrators
	18) Support to overcome language barriers
	19) Support for various learning media and resources
	20) Support for human resources such as operation staffs and teaching assistants

In the following chapter, using the multinational e-learning system model mentioned above a real multinational e-learning system and its key factors were developed and implemented with key factors of the model. More details about the twenty key factors are discussed in the Chapter 5.

Chapter 5: Model Implementation and Evaluation

In accordance with the proposed model for multinational e-learning and its key factors, a multinational e-learning system is established for the ACU project. The ACU Project is an official development assistance (ODA) project supported by the Ministry of Education, Science and Technology of Republic of Korea, to establish a cyber university to offer online higher education programs targeting to ASEAN countries. This chapter explains how the twenty key factors of a multinational e-learning system were implemented on the ACU project according to the process model proposed in this thesis.

Model Implementation

The environmental domain indicates an area related to things that help create a learning environment such as educational policies, e-learning experiences, and infrastructure. Because of its nature, it requires active participation and support of the concerned government. There are ten (10) key factors belonging to the environmental domain.

Environmental Domain

Securing physical space and network stability for e-learning. In order to securing physical space and network stability for e-learning, students should be allowed to use the computer lab to take e-learning courses by allocating a slot for e-learning courses in the multimedia classroom. Stable network speeds can be obtained by using the TIEN for academic exchanges between the hub university and the participating universities. There will be improvements in the network speed of a learning Management system by directing the learners to receive the e-learning contents from the media servers of an e-learning center nearest to them. An option will be given to learners to select different size of e-learning contents according to their network settings.

E-learning publicity and its activation. There are a few ways to publicize the project and e-learning reinforcement. E-learning workshops will be held for the professors, learners and administrators of the participating countries with an aim to promote the understanding of e-learning and teaching and learning activities through e-learning, while publicizing the ACU project. Promotion Kits (brochures, souvenirs, video clips) will be distributed for the publicity. The publicity of the ACU project will be attracted through the advertisements on newspapers, websites and blogs. By hosting e-learning conferences, e-learning in the ASEAN region will be reinforced while promoting the project.

Selecting and developing joint educational programs for credit transfer. Joint educational programs for credit transfer are selected and developed through the following process (Figure 5.1). By submitting of a request form by representatives of participating universities to the Committee, a combined course list and its Syllabus will be distributed to all participating universities. After selecting courses based on preferences of the Committee members, e-learning contents were developed with institutional and technical support by ACU Secretariat. After finishing the content development, each university posts its bulletins on all of the course and syllabus and operated the e-learning courses based on each institution's policy (MEST, 2012c).

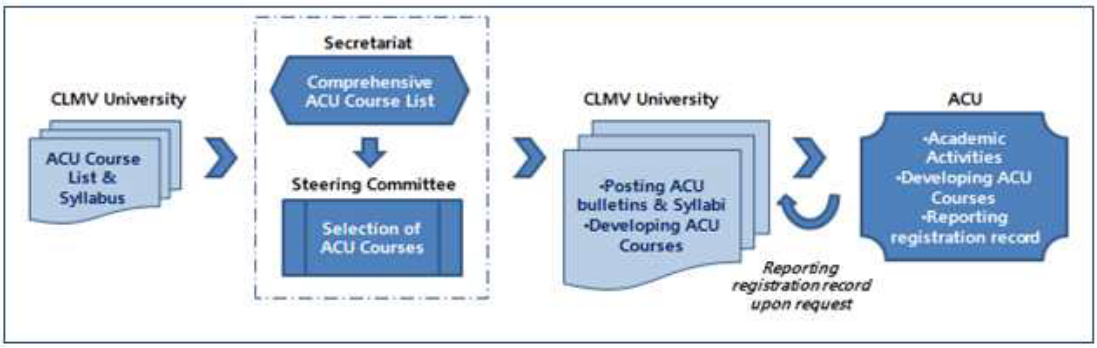

Figure 5.1 Course selection process
Source: MEST, 2012c, p.3

Credit transfer policy among participating universities. There are a few ways through which the participating universities can recognize each other's academic credits. When various universities come together to implement a credit transfer service, through a multinational e-learning system there should be guidelines on how

to recognize one another's credits (MEST, 2012d). All of participating universities were recommended to accredit the credit earned from ACU, however also could decide whether they would reflect it directly or accredit it as based on home institution's credit accreditation policy. Registration record were documented and stored up in the hub center, also were provided to any universities upon request.

Credit transfer with the use of network systems and the Internet among participating universities. Academic credits can be transferable with the use of network systems and the Internet among participating universities. The participating universities should actively adopt a way to secure stable networks such as the TIEN network. They can have academic exchanges through the credit transfer system such as learning management system through the Internet. Through a research competition where each participating university prepares measures to reinforce e-learning in their universities, active participation is expected to the participating universities in multinational e-learning.

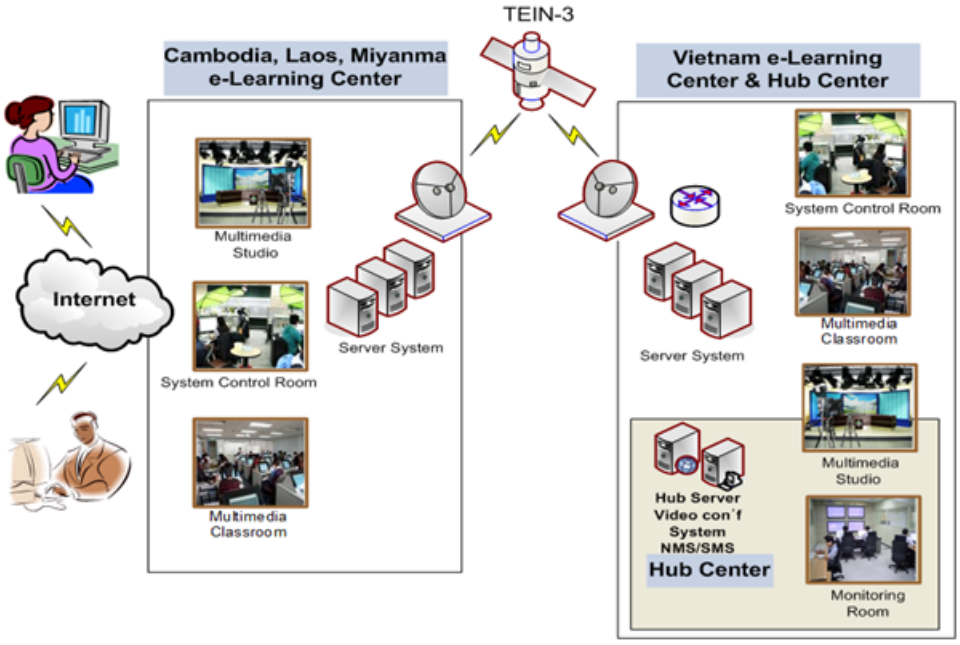

Figure 5.2 Plan for TIEN 3 in participating countries
Source: MEST, 2011b, p.19

Policy support on agreement. There should be policy support in place for the system. The memorandums of understanding signed among the participating countries and the participating universities, the governments will help gain a foothold in securing the

government support, participating and policymaking efforts. As the participating universities share the following management guidelines, confusion will be prevented and an accurate understanding of the project will be further disseminated, which will draw out participation.

Operation of the steering committee. The steering committee operates in the following manner. While reflecting the opinions of the participating countries and the participating universities, the steering committee with representatives from the participants was formed upon their requests. The committee discusses and votes on the relevant agendas. The terms of reference of the Steering Committee (MEST, 2012h) should be written to be referred to operate the committee.

Selecting and managing expert groups to pass down e-learning knowhow. Expert groups are selected and managed to pass down e-learning know-how and to verify validity in planning and implementing e-learning. By selecting the main collaborative university, the e-learning expert groups take in charge of the project planning and main tasks. By forming and managing an advisory committee in charge of the following areas, the validity and expertise of the related areas are enhanced.

- Curriculum design and planning
- Credit transfer system
- Quality assurance standards and evaluation
- Project planning and implementation

Selecting participating universities. The participating universities are selected according to the terms of reference of the ACU Steering Committee (MEST, 2012h). To guarantee quality assurance of multinational e-learning and e-learning contents offered by participating universities, there is required to have a regulation to select a new participating university and agreements by participants. The applicant universities and governments should submit the application forms to the management committee, then the committee discusses and decides whether to grant the membership to these universities.

Obtaining outstanding manpower in development and management of e-learning. It is paramount to obtain outstanding manpower for e-learning development and

management. The qualification and role description of local staffs are needed to be clearly stated and the committee can select the developers recommended by the participating universities.

Table 5.1 *Qualification Criteria and Role Description of SME*

Subject Matter Expert (SME)	
Qualification	• Academic criteria - Doctoral degree holders with 3 years of experience in the related field. ※Consideration of the major area, the holders of a master's degree in the field or more than 5 years of experience and recommended by each university • Language ability: Ability to make English-based transcript and operate course in English • Screening Criterion: To be decided with the Steering Committees operation based on eligibility of SME
Role	• Receive script-writing guideline, storyboarding, e-learning contents file (developed), subtitles, and study material from professional contents developer • Write script, Upload student material and course reference, and Record lecture • Review storyboard, lecture video, e-learning contents file(developed), English subtitles, and student material

Source: MEST, 2012g

Educational Domain

This domain is made up of six (6) key factors related to educational support. Educational programs and training such as workshops, seminars and orientations are provided to e-learning participants.

Method and process of e-learning content development. The guidelines of e-learning content development process and method (MEST, 2012f) offer methods in the following areas.

- Content Development Process
- Storyboard File Naming Rule
- Storyboard Template
- Storyboard Screen Numbering Rule
- Design Guideline

- Storyboard Guideline
- Learning Screen
- Development Guideline
- Submitting the Prototype

The development team at the ACU secretariat will be in close liaison, giving technical support and conducting quality assurance on the quality assurance manuals and e-learning contents.

Training on the e-learning concept and effective learning methods. Training on the e-learning concept and effective learning methods can be arranged in the following manner. Through e-learning workshops, learners will have a better understanding of e-learning and effective learning methods. General guidelines of e-learning quality will be given through the dissemination of a quality assurance guide.

Continuous training for the e-learning content developers. It is highly desirable to train the e-learning content developers for the successful e-learning implementation. Training sessions for instructional designers, programmers, system administrators should be arranged to develop human resources for e-learning content development. The development team at the secretariat should continue giving advice and technical support.

Training program in LMS use for e-learning users. E-learning users should be trained on the use of LMS. Before the start of a semester, e-learning workshops should be given to professors, learners and administrators to make them familiar with the learning management system. The ACU Learning Management System (LMS) composed of a homepage session and online classroom session. It offers management function to operate academic semester through the Internet and evaluation function with statistics (MEST, 2011).

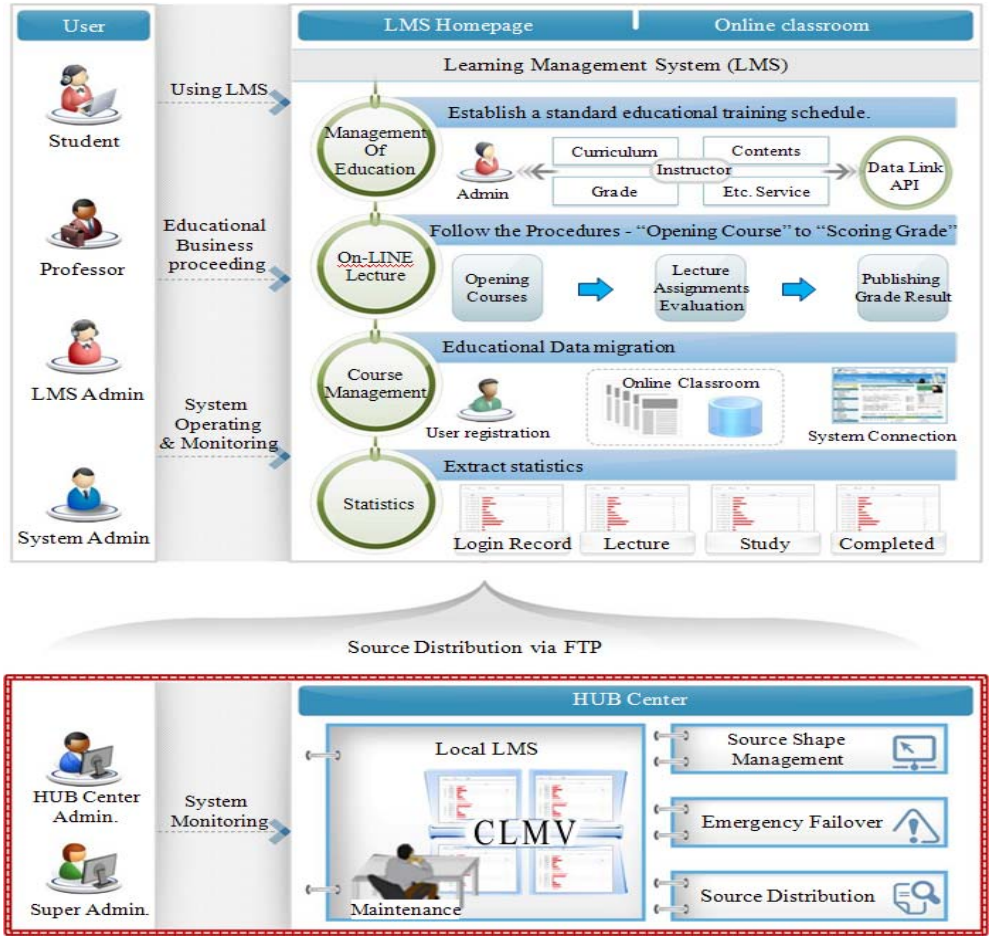

Figure 5.3 Design of learning management system
Source: MEST, 2011, p.5

Training on e-learning course management and teaching and learning strategies. There needs to be training sessions on e-learning course management and teaching and learning strategies. By offering operation regulations, instructors will have the regulations regarding the e-learning course management. And by connecting professors in charge of course management and professors in charge of course development, they can either ask or answer the questions with respect to the e-learning contents and the course management. The learners will be familiarized with the e-learning methods through e-learning orientations.

Training on online assignment submission and its evaluation. Learners and instructors should be familiarized with online assignment submission and its evaluation. Through the operation regulations, a method and a process of online assignment submission and evaluation will be drawn. The orientation for professors in charge of course management and learners will be held.

Supportive Domain

This domain includes the supports in all fields apart from the environmental and the educational domains, such as the support for technical and human resources.

Technical support for professors, learners and administrators. Technical support should be given to professors, learners and administrators. E-learning management manuals will be given to professors and administrators. Orientations will be given to learners to teach them how to use the learning management system. Teaching assistants will be assigned to each course for technical support. Technical support will be provided by the secretariat via emails, messengers and telephone.

Support to overcome language barriers. Support measures should be thought of in order to overcome language barriers. Professors at each participating university will manage the course in their local language to ease the burden of English-language-based e-learning contents. By providing local language subtitles to the English-language-based e-learning contents, learners can have language options.

Support for various learning media and resources. The system should be able to support with various learning media and resources. By providing audio files of e-learning contents, learners can study the contents with MP3 players. By allowing learners to download or print the reference materials and lecture notes, they can learn the contents in various ways.

Support for human resources such as operation staffs and teaching assistants. Support for human resources such as operation staff and teaching assistants should be made available. By assigning operation staff and teaching assistants to every course, learners can get help when facing with educational or technical difficulties during e-learning activities.

Operating e-learning courses

As has been mentioned above, the multinational e-learning system of the ACU project is made up of domains such as environment, education and support. Among the

participating universities, University A offered three e-learning courses in the fall semester of 2012: October 2012 ~ March 2013.

This is the information of the e-learning courses operated by University A (Table5.2). These courses were operated for fifty (15) weeks on the ACU Learning management system accessed through the Internet. Even though these three courses are developed as three (3) credits courses, the University A accredited its credit differently based on their institutional policy.

Table 5.2 *E-learning Courses Operated by University A*

Area	Course Title	SME	Co-Instructor	Credit	Num. of Students	Started date
Eng.	Introduction to Computer System & Network	Cambodia	Cambodia	1.5	60	30/10/2012
	Programming Language (Java)	Vietnam	Cambodia	5	60	05/11/2012
	Database Analysis and Design	Cambodia	Cambodia	2	60	21/11/2012

Multimedia classroom

There were two multimedia classrooms arranged for e-learning with 30 computers per each room. Students could use the classroom based on their arranged schedule. TAs attended for technical support. Figure 5.4 shows that multimedia classroom of the University A. Students are divided into two groups to use the classroom and asked to come to the classroom for e-learning based on its arranged schedule.

Figure 5.4 Multimedia classroom of University A

Evaluation

A multinational e-learning system was initially developed and implemented based on the proposed multinational e-learning model. Twenty key factors were also installed in environmental, educational, and supportive domains of the model and those were implemented in one of the participating countries for one semester. Reflection and suggestion for supplementation of the developed process model and key factors of multi-national e-learning system were collected through the interviews of four representatives of the participating universities. Online survey for user satisfaction was also conducted on thirty-four students after one semester operation of e-learning at University A on the 12th of February, 2013.

The representatives in charge of e-learning at participating universities agreed that:

- The multinational e-learning system model proposed in this thesis offered appropriate methods and process to conduct multilateral e-learning in developing countries.
- The key factors of the multinational e-learning system are of the required key factors needed to implement e-learning in the developing countries.

However, several challenges and observations were made regarded the proposed model

- The awareness on e-learning among students and even parents is cultural barrier to promote e-learning
- Due to the limited Internet access and ICT infrastructure, many of the learners participated in e-learning at the e-learning labs in the participating university. Because of this, the main strength of e-learning: ability to access the contents anywhere anytime could not be well realized.
- With the absence of national policies and regulations for e-learning, it was hard on the university to recognize the credits of online courses the same as the credits of offline courses.
- Students rarely have motivation to register in the e-learning course developed in English because of their poor English skills.

- Short-term training programs offered to course developers should continue to be offered.
- It is apparently difficult to offer online credit courses when the learners do not have enough e-learning experience.
- There are many technical problems because of frequent outages and unstable network connections.
- Since various countries are taking part in multinational e-learning, their time zones, national holidays and work hours are bound to be different. When there is an emergency such as an outage, the normal operation of the e-learning system may become difficult.

There were thirty three (34) undergraduate students who took an e-learning course for a semester at University A. An online user satisfaction survey was conducted on them and its result was analyzed as follows.

Basic information survey

Place for e-learning. When the respondents were asked a question; 'Where do you mainly work at the computer?', 58.8% of the respondents, which is more than a half, answered that they used the computer at home while 35.3% of the respondents said they used the computer at the university. 5.9%, the rest responded that they used the computer both at home and school (Figure 5.5).

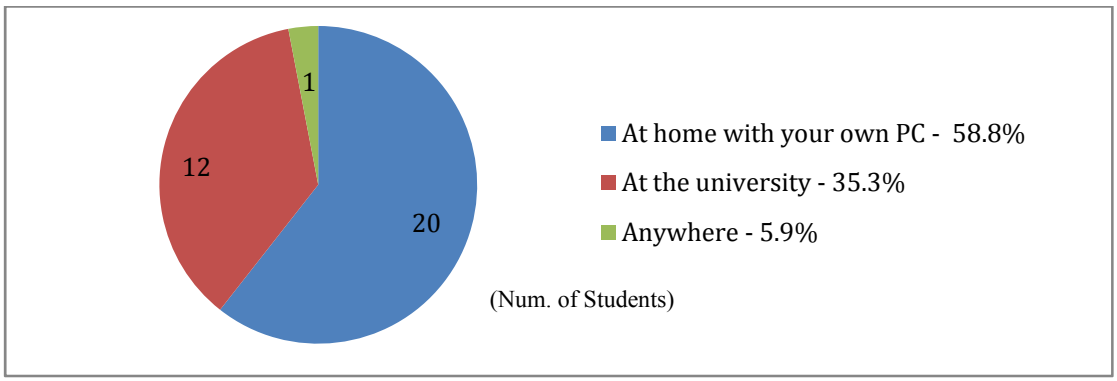

Figure 5.5 Places for using computers

Hour of using computer. When asked a question to know how many hours they use a computer per day; 'How long do you work at the computer per day?', 82.3% of the respondents answered that they use computer more than three (3) hours. Among them, 38.2% said that they use the computer more than five (5) hours (Figure 5.6).

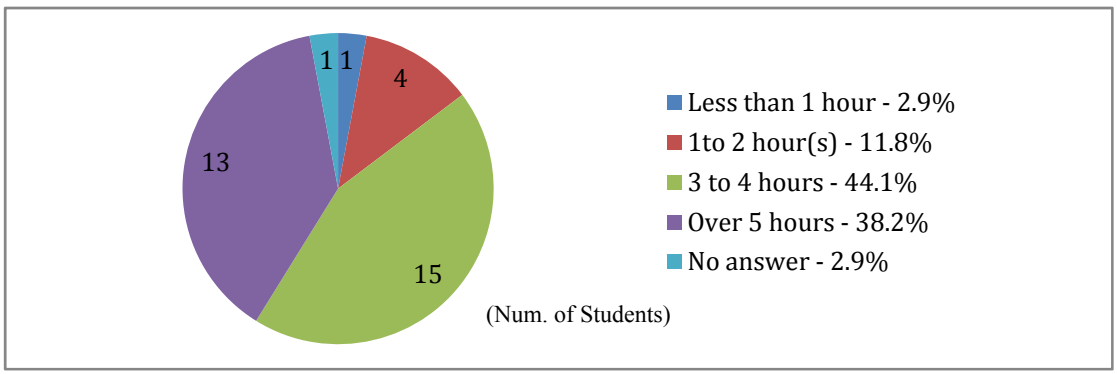

Figure 5.6 Hour(s) using a computer per day

Purpose of using a computer. In order to investigate their purpose of using a computer, the respondents were asked a question, 'What do you usually do during working at the computer?'. Most of the respondents answered that they either used the computer to do their assignment or check emails (Figure 5.7).

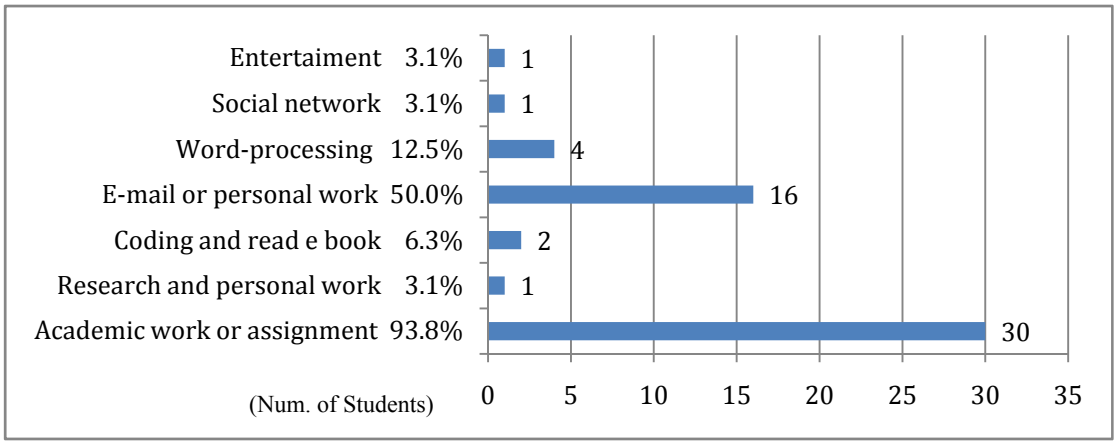

Figure 5.7 Purpose of using a computer

Way to connect to the Internet. When the respondents answered yes to the question 'I access to the Internet outside of school', then they were asked a question 'If yes, how do you access?'. As shown below in the figure, 63.6% of the respondents answered that they access the Internet through their smart-phones (Figure 5.8). Apart

from this, with the exception of one student all the respondents said they took part in online lectures away from the university.

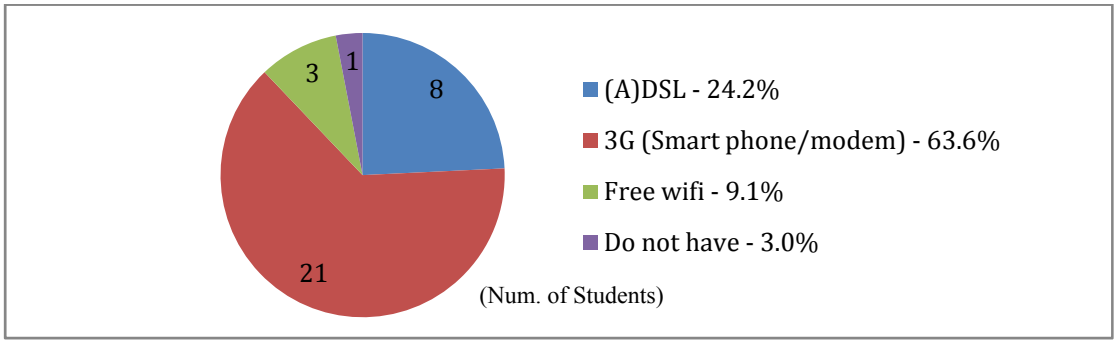

Figure 5.8 Way to access to the Internet

E-learning satisfaction survey

Convenience of e-learning contents. In the survey for convenience of e-learning contents, when the respondents were asked a question; 'I am in control of the contents of e-learning (following the instructions such as going over the next slides, doing the quiz, viewing the scripts), only 15.6% of the respondents answered they found them difficult to maneuver while 53.1% said they found the functions convenient (Figure 5.9).

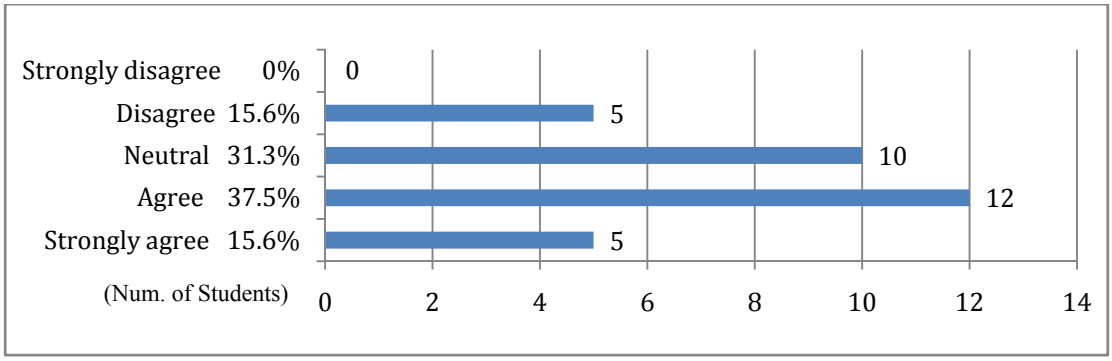

Figure 5.9 Convenience of e-learning contents

Difficulty of e-learning contents. When the respondents were asked about the level of difficulty of the program, 43.8% of responded that it was ok. And more than a half of the respondents, 53.1% said that it was appropriate while only 3.1% of the respondents answered that they did not agree with the appropriateness of the program. For this reason, one can assume that the learner satisfaction with the level of e-learning contents was fairly high (Figure 5.10).

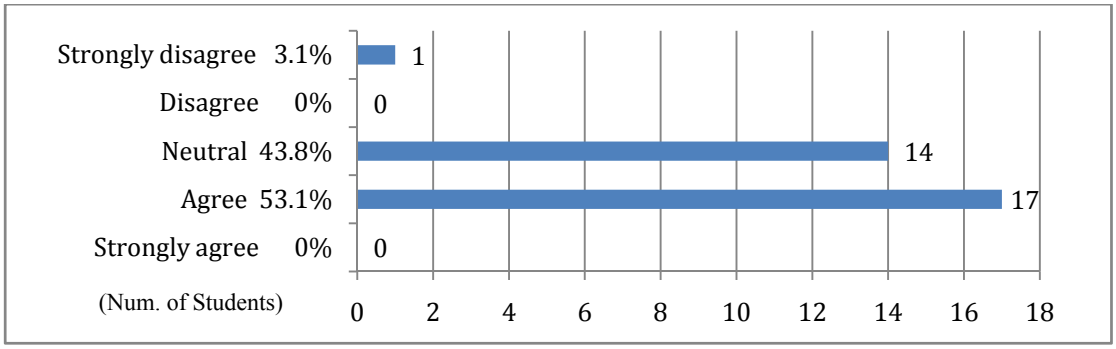

Figure 5.10 Level of difficulty and program appropriateness

Validity of evaluation methods. When the respondents were asked whether the evaluation was appropriate to check what has been learned, a half of the respondents, 50% said that it was ok, followed by 31.2% of the respondents who answered it was appropriate, whereas 18.8% of them replied that it was not appropriate (Figure 5.11).

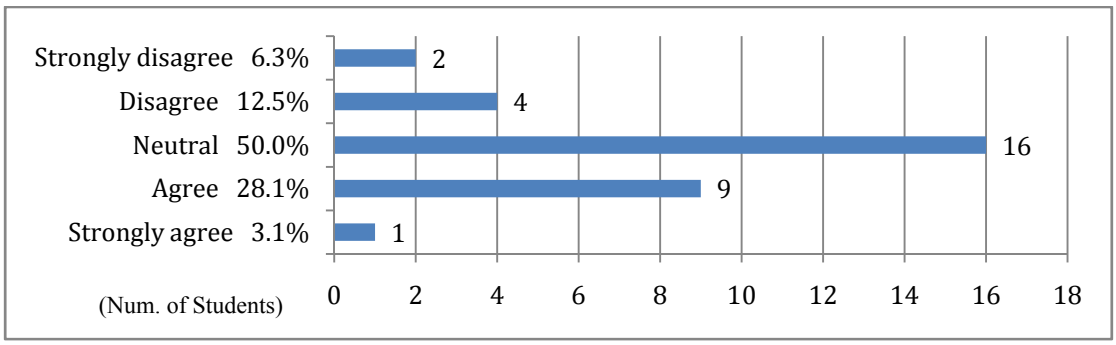

Figure 5.11 Validity of evaluation method

Convenience of learning management system. When asked about the convenience of the learning management system, 50.0%, which is exactly a half of the respondents, said they thought that the system was convenient whereas 20.0% of the respondents said they did not find the system convenient (Figure 5.12). Further discussion is necessary to find a better way to improve the effectiveness of learner orientation before the start of a semester.

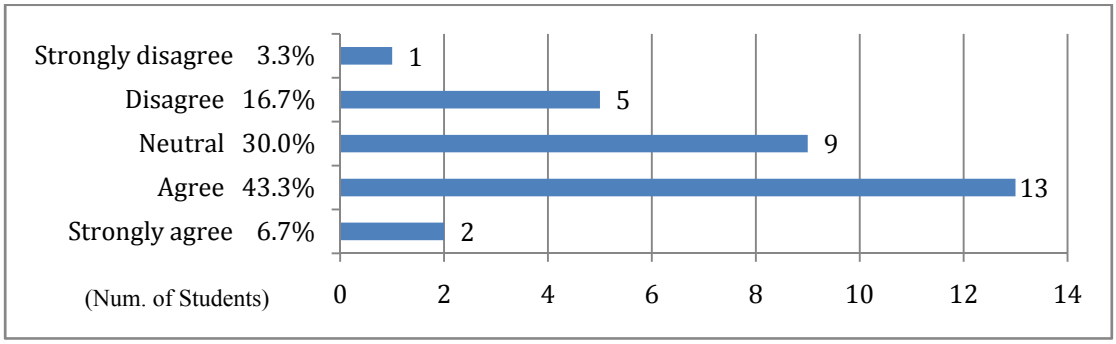

Figure 5.12 Convenience of learning management system

Stability of Learning Management System. To find out about the stability of the learning management system, the respondents were asked whether they were satisfied with e-learning system stability. 31.1% said that the system was not stable while only 25.0% answered that it was stable enough. One of the reasons is because the newly developed learning management system had not been tested enough (Figure 5.13).

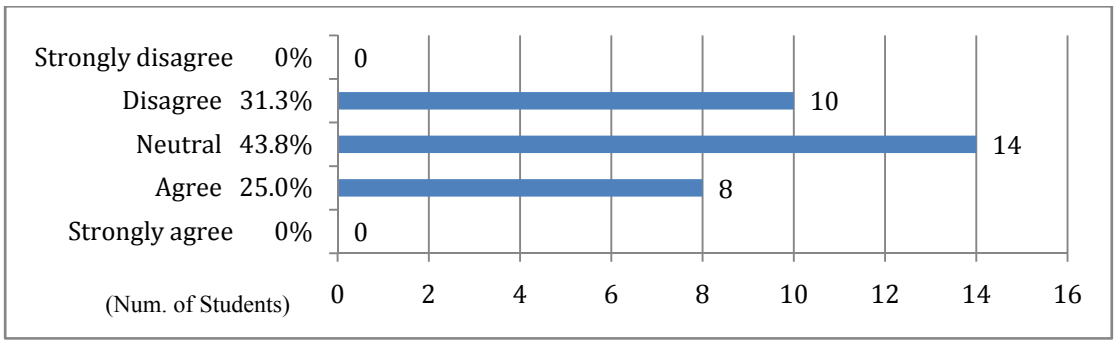

Figure 5.13 Satisfaction in learning management system

Design adequacy of hardware equipment and infrastructure. The respondents were asked about the appropriateness of hardware infrastructure such as computers and the Internet connection for e-learning. 28.2% of them that said they were appropriate while 43.7% answered that they were not appropriate. One of the reasons for this is not from the learning management system but from the inconsistent electricity supply in the participating country and the different work hours of the participating countries, which disabled to quickly respond to the problems.

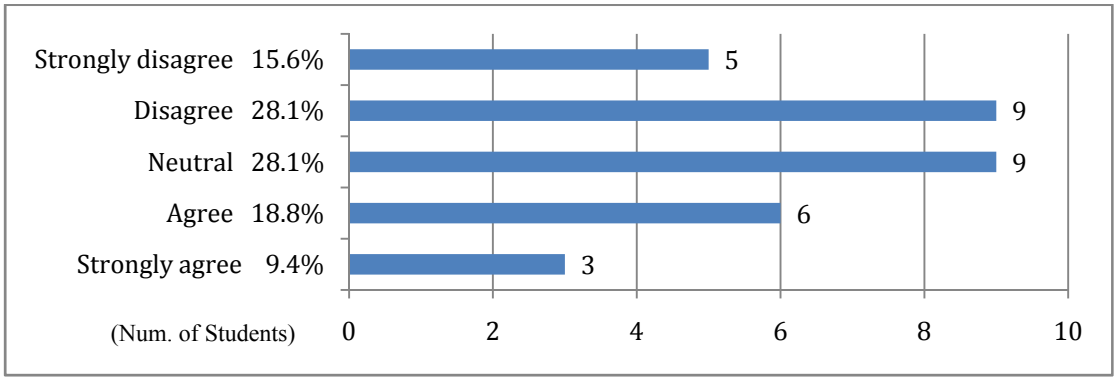

Figure 5.14 Adequacy of hardware equipment and infrastructure

Satisfaction of the support of co-instructors and teaching assistants. When the respondents were asked whether they were satisfied with the support given by the co-instructors and teaching assistants (TAs), 43.8% said that it was average while 25.0% of them answered that they were satisfied with it.

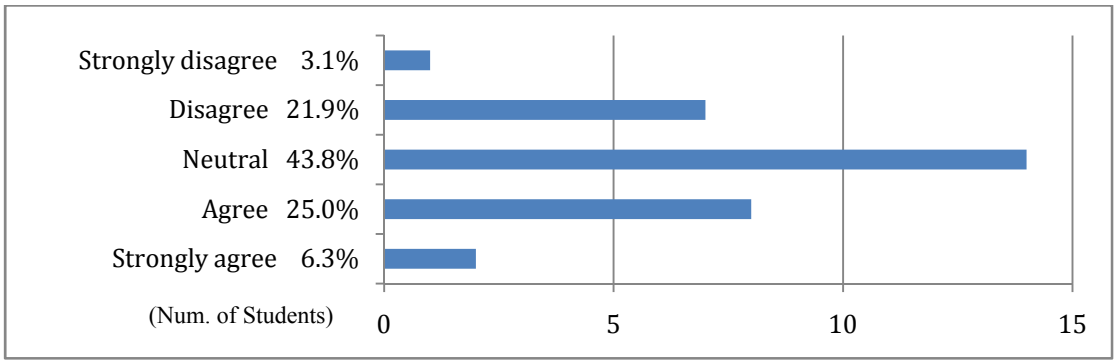

Figure 5.15 Satisfaction with supports of co-instructors and TAs

Learning activities needed to enhance learning effectiveness. When the respondents were asked about their preferred learning activities to enhance the learning effectiveness; 'What kinds of learning activities should be reinforced to improve learning effectiveness?', more than a half of the respondents answered chose both online and offline lectures. From the result, one can assume that the students take the online lectures and the offline lectures side by side. Moreover, 64.7% of the respondents requested the courses on practicum and simulation (Figure 5.16).

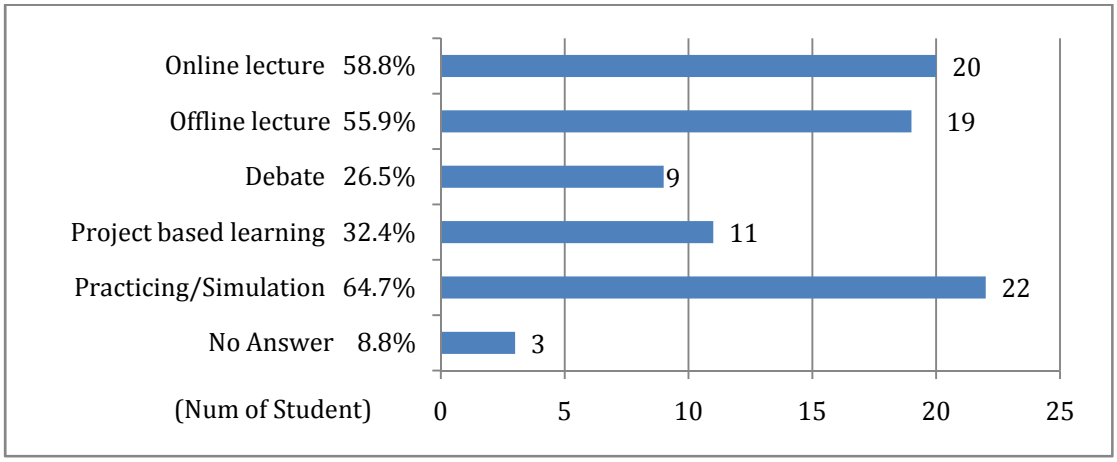

Figure 5.16 Learning activities improving learning activities

Satisfaction with the project and its secretariat. With regard to the satisfaction with the management of the secretariat, 37.5% of the respondents were either satisfied or strongly satisfied with the management, whereas 46.9% of them said that they thought it was ok. 15.7% were either dissatisfied or strongly dissatisfied with the secretariat's management.

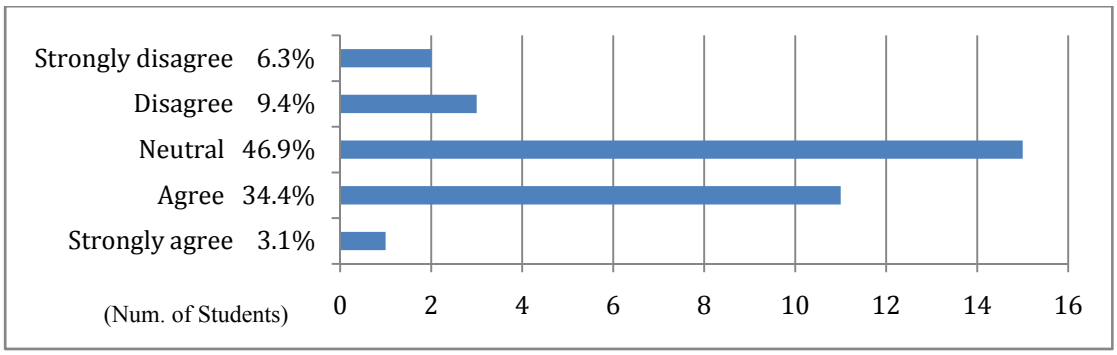

Figure 5.17 Satisfaction with the multinational e-learning system and the secretariat

Willingness to take part in e-learning in the future. When the respondents were asked whether they would like to take additional courses in this e-learning system, 59.4% (40.6% answered 'agree', 18.8% answered 'strongly agree') gave positive responses while 21.9% answered 'Neutral' and 18.7% (15.6% answered 'disagree', 3.1% answered 'strongly disagree') gave negative responses (Figure 5.18).

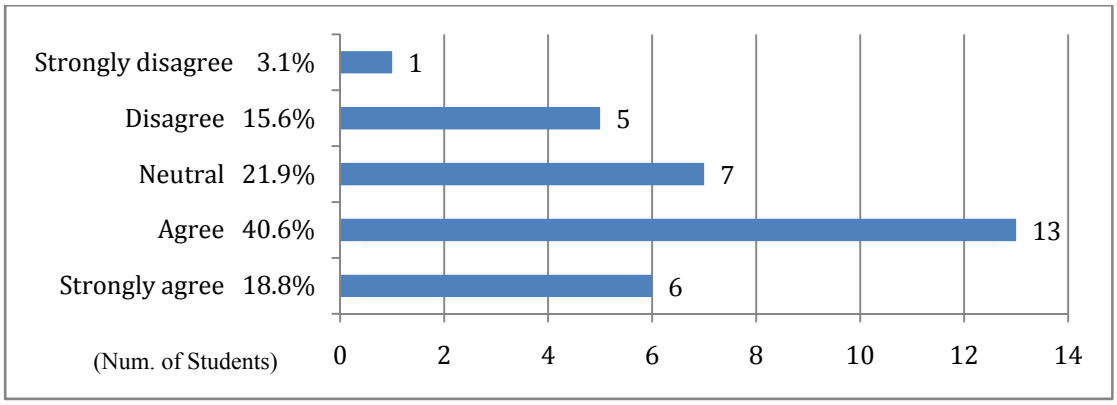

Figure 5.18 I would like to take additional courses in this e-learning system

Summary

The method and the process of developing and implementing a multinational e-learning system have received positive response along with the appropriateness of the key factors in the multinational e-learning system for developing countries. Yet, there still is a lack of confidence in the e-learning effectiveness when compared with the traditional education. Furthermore, the limited Internet access and unstable network connection of developing countries made it difficult to realize the main strength of e-learning; the ability to access the contents anywhere anytime. What's more, they lack the e-learning experience along with inadequate e-learning educational policies. Therefore, systematic rules and regulations should be in place to recognize the online

course credits the same as the offline course credits. E-learning contents were developed in English at the request of the participating countries, however, learners were found to be struggling due their poor English skills. As support measures, short-term training programs were arranged for the e-learning participants but there has been a request from the participating countries to find a measure to continue supporting the e-learning developers with relevant feedback and training. The multinational e-learning system supports various countries with their e-learning needs with the hub center as the center. However, due to the different time zones, work hours, national holidays and academic calendars, it is difficult to attend to an emergency quickly. Solutions to this problem must be found.

82.3% of the survey respondents were found to be using computers for more than three (3) hours a day. It is a fairly high rate, considering the fact that only 5% of the total population has access to the Internet. As 63.6% of the respondents answered they accessed the Internet through their smart-phones, it is worth considering the use of smart-phones for e-learning. Nevertheless, there was low satisfaction in the stability of a learning management system and the appropriateness of hardware and infrastructure. And with respect to the educational domain, learners showed preference for courses with practicum and simulation and thought that both online and offline courses are beneficial to enhance learning effectiveness. Hence, there is a need to consider conducting online and offline courses side by side. Most of the respondents showed strong willingness to take part in future e-learning courses.

Chapter 6: Reflection and Model Elaboration

Based on the results of the learner surveys and the interviews with the steering committee members, in this chapter the multinational e-learning system model proposed in this thesis is modified and supplemented on the basis of the user experience while assessing the effectiveness of the system.

Reflection

In this dissertation, a process model and its twenty key factors are developed to establish a multi-national e-learning system. For quality assurance of a multinational e-learning, twenty (20) key factors are clarified to consist of a multinational e-learning system in three domains such as environmental, educational and supportive domain which are adapted from Jung's quality assurance index for the ASEAN region. Based on the suggested models and its key factors, three e-learning programs are implemented for one semester at the University A. Based on the interview of the participants in e-learning, some challenges and suggestions are clarified to elaborate and facilitate the developed model and its key factors with pedagogical and policy guidelines. Individual interviews were conducted at the 2nd the ACU steering committee from November 14th through 16th, 2012. The representatives of the participating universities and the participating countries discussed the ways to resolve the issues found during the pilot operation of the multinational e-learning system and the ways to improve the system.

Environmental Domain

Inadequate institutional education policies for credit accreditation through e-learning. There are no legal grounds or university regulations in place to recognize the online course credits the same as the offline course credits. This can be supplemented through the full-scale e-learning operation and reinforcement, which in turn promotes e-learning awareness in the region. And governments and universities should set up policies, rules & regulations for e-learning after discussion on the e-learning management experiences.

Differences in cultural and work approach. There are disparities in the work styles among the secretariat, which leads the project, and the course developers in the ASEAN region. The developers often delay the deadlines, causing the rescheduling of the entire development. Due to the difference in work ethics between the secretariat that wants to follow the schedule and complete the project on time and the participating universities that dislike to be pressured with deadlines and would like to take the work at ease, the burden is on both the ways when there is a delay in the schedule. There is a way to resolve the differences. According to the mediation and negotiation among the participants, the project schedule should be drawn up so that the participating universities can follow and cooperate.

Government support with regard to multinational e-learning. There are visa issues for SMEs and staffs from CLMV to visit Korea for training while it is hard to clear customs in the participating countries for the delivery of facilities and equipment. This can be resolved if the participating countries give public support and cooperate with the project by handpicking their local managers.

Institutional support for faculty members and staffs working on e-learning. Though the professors, administrators and staff involved in the e-learning courses go through difficulties due to the lack of e-learning experience, none of them are not full-time workers but part-time workers for the project. They are suffering from a heavy workload. This issue can be worked out if **t**here are support measures for e-learning participants in the project from the universities so that they would not be reluctant to participate in e-learning due to the heavy workload and will be able to use their ability fully in the project. And having the professors in charge of managing the pilot e-learning courses manage the same e-learning courses in the future, they can accumulate the knowhow and better manage e-learning courses. By assigning more part-time faculty members to alternate the supervision of the e-learning center, the difficult of assigning full-time faculty members and staffs can be moderated.

Expansion of ICT infrastructure and stable e-learning support at national level. Since there are frequent outages due to the inconsistent electricity supply, secure e-learning services through the learning management system in a hub center cannot be

guaranteed. This issue can be easily resolved by connecting students to an e-learning center of their university rather the learning management system at the hub center. The student learning activities should be sent to the hub center on a regular basis and the hub center will manage the results sent by the e-learning centers.

Educational Domain

Training and consulting for teaching and learning through e-learning. E-learning instructors and learners do not have enough knowledge about instructional strategies and assessment methods to enhance their teaching and learning effectiveness through e-learning. Continuous workshops or seminars on effective e-learning instructional strategies along with on-demand consultation help develop necessary e-learning competencies for instructors and learners.

Continuous support and training for e-learning content developers. When the staff, who were trained in Korea, moved on to other jobs and took up different work, there is vacuum in the personnel. The issue may seem very critical but by holding continuous training session in the participating countries instead of inviting local developers to Korea, there will be more trained staff, which in turn will have a ripple effect in education. Educational contents that can be repeated in the form of e-learning should be developed so that they can be used according to the participants needs.

Supportive Domain

Measure to overcome language barriers. There are difficulties to sign contacts with local professionals such as co-instructors and staffs working at the e-learning center due to their poor English skills and incorrect contact information. Learners feel burdened by having to learn the e-learning contents in English. In order to resolve the language barriers, assessment or other verification process is required to check co-instructor applicants' English skills**.** A local operator or an assistant should be recruited to be in charge of the verification process. With the help from local co-instructors and teaching assistants, learners can ask questions and receive answers in local languages.

Need to secure an active communication channel between the secretariat and the participating universities. There are limitations in training instructional designers,

programmers, and filming staffs to enhance their work capacity in a short period of time. There have been requests to make a communication channel to continue the training and for Q&A. As a solution to this problem, the trainees should get advice in their respective fields, and through messengers and emails their questions can readily be answered from experts dispatched to the hub center.

Securing local staff. There are difficulties in hiring local co-instructor, teaching assistants, interpreters/translators. The recommendation of the participating universities makes easy to hire local staffs. In a case of that local staffs participated in training programs change their job position and take a part in the other work, there can be no one educated to support the job. For the reason, institutional support is required to secure local staffs at the job position to support e-learning.

Support measures made with consideration of the time zones, national holidays and work hours of the participating countries. As the secretariat, the hub center and the participating universities operate in different time zones and work hours and with different national holidays, there are bound to be delays from different work hours, holidays, lunch hour, or unexpected outage when urgent work needs to be attended. Unlike the centralized management system where the participating universities access the learning contents from the learning management system in the hub center, each participating university carry out the e-learning using its own learning management system in its e-learning center and send the outcomes to the hub center where the results are compiled.

Time extension for pilot operations in order to get familiarized with the e-learning system and its related works. Due to the frequent delays and issues resulted from the lack of e-learning management experiences, the user satisfaction has been highly compromised, interfering the e-learning reinforcement. As one of the solutions, the participating universities should set dates for program testing and a pilot operation before the start of a semester, and through the prepared management scenario and manual, the participants can understand the workload and get accustomed to it. In particular, program testing or pilot operations should be conducted before the implementation of a new or upgraded learning management system, with the participation of the concerned university officials.

Model elaboration

Based on what has been discussed so far, the multinational e-learning system was modified and supplemented. At first, Stage 2, design by negotiation was also revised and facilitated during the process of negotiation. First of all, in the 'Rapport & share the direction' step, the participants introduced each other and a comfortable environment was created to carry out discussions and negotiations. Prior to the discussions and negotiations, the participants shared the blue print of the common purpose and the plan of the project. And in the 'Analysis' step, they shared their opinions with regard to the purpose and the plan of the project while understanding each other. And during the 'Presentation of participants', the participants explained their requests and national status to the fullest in order to have their requests reflected in the final plan. The 'Analysis and understanding' step is therefore the participants to analyze and recognize the other participants' requests. In the 'Proposal of alternatives' step, the participants resolved their differences and found alternatives. The steps such as 'Analysis and understanding', 'Debate & Negotiation', and 'Proposal of alternatives' were repeated until the participants reached a consensus. When the consensus was reached, in the 'Finalization of strategies' step the result of mediating the participants' opinions was proposed as the final plan. The final plan is revised and supplemented during the 'Devising plans' step. In the final step; 'Agreement among participants', ideas are proposed and the participants agreed to the ideas. Based on the agreement, a memorandum of understanding was signed and the design process through negotiation was completed (Figure 6.1).

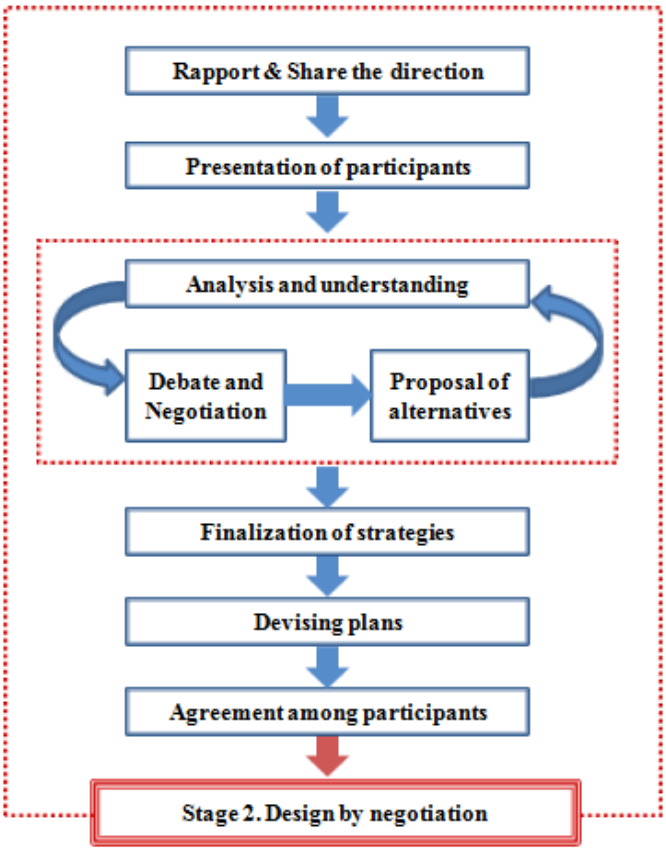

Figure 6.1 Stage 2. Design by negotiation

At stage 3, an accurate understanding of the project plan was applied to writing a draft of the suggested model. Then, the draft was reviewed by the secretariat and was further modified and supplemented. However, through the pilot operation for a semester, views were gathered to reinforce the test process in the development stage and involve the system administrators of the participating countries in the test process. The existing draft model was supplemented in order to reflect the initial project plan as has been shown in Figure 6.2 with a test and simulation process.

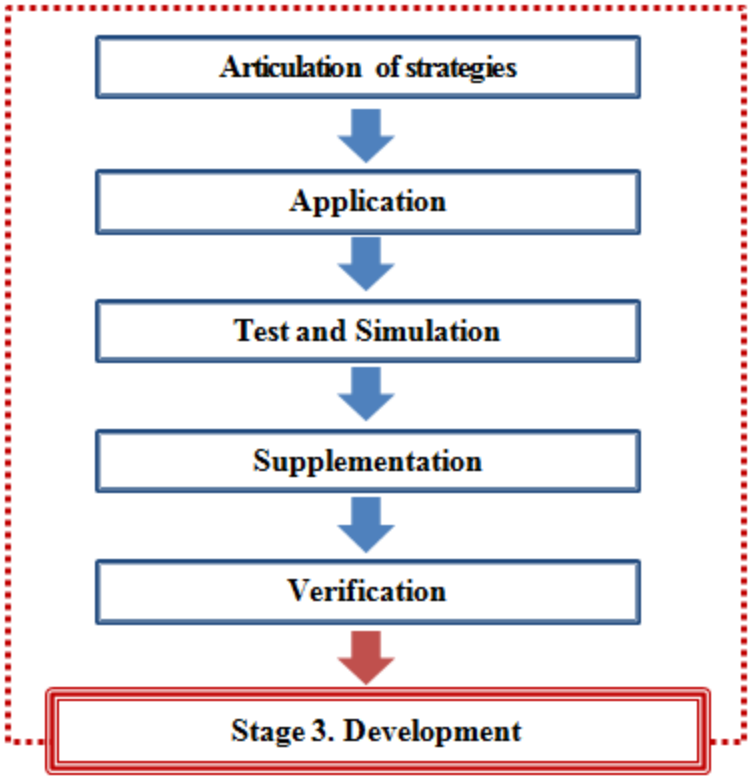

Figure 6.2 Stage 3. Development

In the implementation step of Stage 4, there was a request to conduct a pilot operation before the full-scale operation. Though it was possible to conduct a pilot operation in a test process during the development, local system administrators were not involved in the process with the developers. There was a concern that if they took part in the development when the system was not yet developed and was erroneous, they might be confused about the system. So pilot system management training sessions were arranged after the system completion so that the system administrators would better understand their roles and become familiarize with the system (Figure 6.3). Rather than completing the development process, a pilot operation should be held prior to the full-scale operation to further modify and supplement the system (MEST, 2012f). Through the pilot operation, not only technical functions of the system should be tested but also whether the final product corresponds with the design or if there are areas that need modifying, the system should be further modified and supplemented. Through the Application step, the pilot operation is prepared and held. The following figure, Figure 6.3 shows the modified order of Stage 4, based on the user experience.

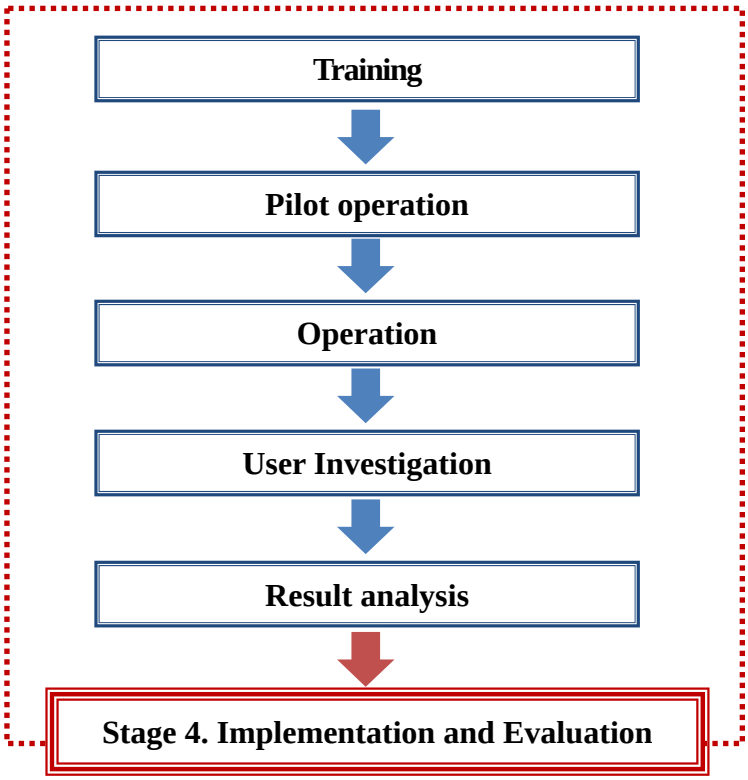

Figure 6.3 Revised Stage 4. Implementation and evaluation

The participants should minimize errors through sufficient testing in the development stage to be able to guarantee the reliability and stability of the developed multinational e-learning system. What's more, they not only test for the functions of the developed multinational e-learning system, but also reduce the errors in the system through a pilot operation before the full-scale operation, and modify and supplement the system to fit the status of their universities (MEST, 2012f). Through the pilot operation, the functionality of the system needs to be tested against the design while modifying and supplementing the system. Through the Application step, the pilot operation is prepared and held. The following figure, Figure 6.4 shows the modified order of Stage 2, Stage 3, and Stage 4, based on the user experience.

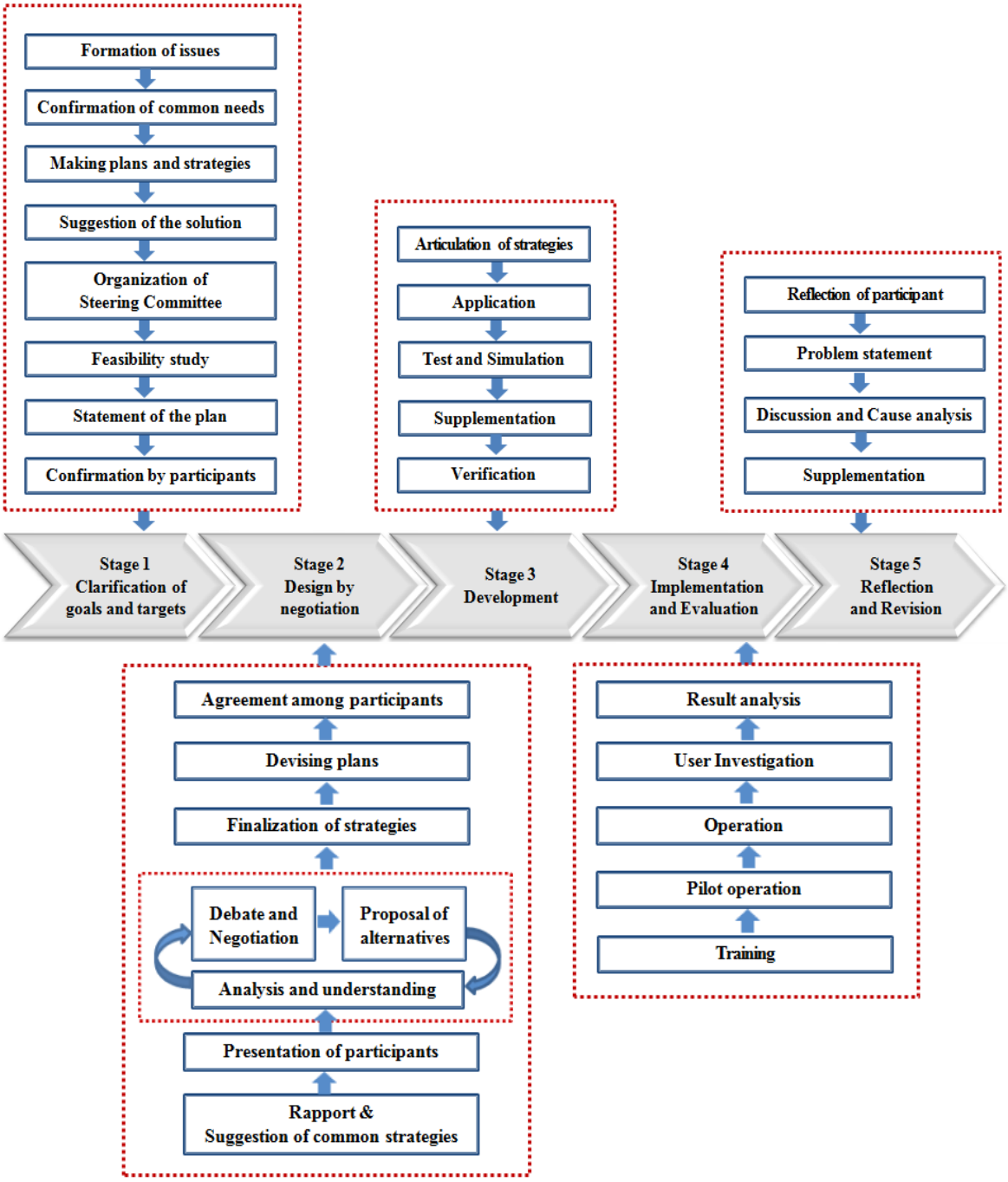

Figure 6.4 Revised 5-Stage process model for multinational e-learning

To sum up the above process result, the following should be considered at each stage in order to develop a multinational e-learning system (Table 6.1).

Table 6.1 *Details of Revised Multinational E-learning Model*

Process	Details
Stage 1. Clarification of goals and targets	
Formation of issues	• Social needs were formed in each participating country.
Confirmation of common needs	• The common requests of the participating countries were gathered.
Making plans and strategies	• Discussions were held to make plans and strategies to solve issues.
Suggestion of the solution	• Suggestions were proposed.
Organization of Steering Committee	• A steering committee was formed to reflect the public opinions.
Feasibility study	• A feasibility study was conducted to analyze the technical, economic and socio cultural validities.
Statement of the plan	• Solutions were suggested from the result of the feasibility study.
Confirmation by participants	• The solutions were discussed and approved by the participants.
Stage 2. Design by negotiation	
Rapport & Share the direction	• General directions were proposed to suggest alternatives with help of a literature review and discussions of expert groups.
Presentation of participants	• The representatives of the participating countries explained the status of their countries and made requests.
Analysis and understanding	• The participants' requests were analyzed and understood.
Debate and Negotiation	• In order to carry out the strategic planning, the current statuses and requests of the participating countries were referenced. • Debates and discussions were held to meet the requests of each country.
Proposal of alternatives	• Alternatives were proposed based on negotiations.
Finalization of strategies	• Strategies to carry out the alternatives were finalized.
Devising plans	• The final plan was drawn up to carry out the strategic planning.

Agreement among participants	• The participants agreed to understand and cooperate with the final plan.
Stage 3. Development	
Articulation of strategies	• The final plan and the specific strategic plans are shared among the participants.
Application	• The development proceeds according to the specific design plan.
Pilot operation	• Through pilot operations, users get familiarized with the system use and can be ready for the full-scale operation.
Supplementation	• According to the result of pilot programs, the system will be modified and enhanced.
Verification	• The final product will be reviewed
Stage 4. Implementation and Evaluation	
Training	• Checking on the preparations for implementation
Pilot operation	• Through pilot operations, users get familiarized with the system use and can be ready for the full-scale operation.
Operation	• Implementing e-learning
User Investigation	• Conducting a user satisfaction survey
Result analysis	• Analyzing the survey result
Stage 5. Reflection and Revision	
Reflection of participant	• Sharing the user experiences among the participants and collecting their views
Problem statement	• Sharing the issues arisen in the system
Discussion & Cause analysis	• Analyzing the cause of the issues through discussion
Supplementation	• Modifying and enhancing the system model by returning to the stage where the issues can be fixed

Chapter 7: Conclusion

Many developing countries often face challenges in using existing design models offered to develop e-learning programs and systems for the developed countries due to the gap in ICT infrastructure, educational policies, human resources and e-learning experiences and competencies. In the light of these issues, a model to build a multinational e-learning system that meets the purposes and demands of the developing world is needed.

This thesis developed an instructional design model for multinational e-learning in the context of higher education in the developing countries in Asia, and offered procedural details and strategies that could be applied in the process of negotiations during the multinational e-learning system development, adopting an action research methodology. Following the proposed model, the multinational e-learning system was established and implemented based on the multilateral participations and negotiations among four selected ASEAN countries with different cultures, educational systems and environments. During this process of a process model development for multinational e-learning, various opinions of the participating countries were sought via needs analysis, feasibility studies and committee meetings to consider the participants' particular circumstances and reflect their demands for e-learning. The e-learning system that was developed following the process model of multinational e-learning was then implemented and evaluated with undergraduate students in one ASEAN country. Finally, results obtained during the implementation and evaluations of the e-learning system were used to further elaborate the process model for multinational e-learning development.

The process model for multinational e-learning follows five stages.

1) At Stage 1, the goals and targets of a multinational e-learning should be clarified via various activities such as identifying common issues, developing plans and strategies to resolve the issues, and proposing detailed solutions. At this stage, a steering committee plays an important role in discussing and

resolving issues and negotiating specific objectives of the e-learning. Needs analyses and feasibility studies have to be carried out to identify common issues of participating countries.

2) At Stage 2, the multinational e-learning system is designed by participating countries through continuous negotiations. Since the participating countries have different environments and demands, they would try their best to reflect their requests in the final design plan. So providing opportunities for these countries to get to know each other, explain their unique positions, and share and negotiate with the other countries is essential to reflect participants' opinion for the design and implementation of multinational e-learning in the model .

3) At Stage 3, the multinational e-learning system is actually developed based on the final design plan specified at Stage 2. More detailed development strategies are articulated at this stage, and shared with the e-learning system developers coming from the participating countries. A pilot operational testing with the developed e-learning system is carried out and revisions made. During the testing process, the developed system needs to be tailored to the situation of each participating university.

4) At Stage 4, the multinational e-learning system is implemented and evaluated. Using the developed multinational e-learning system, e-learning courses are offered to target learners, their effectiveness is examined and learner/instructor satisfaction surveys are conducted. All the evaluation data are analyzed for further improvement.

5) At Stage 5, the evaluation data are shared among the participating countries, new issues and challenges discussed, possible solutions identified. With the suggested solutions, the multinational e-learning system is revised and further elaborated.

While applying the 5-stage model for multinational e-learning, twenty key factors in three domains (environment, education and support) to assure the quality of the

multinational e-learning system were identified, and detailed strategies and procedures for considering each of these factors in developing the quality multination e-learning system were proposed.

By developing the 5-stage process model for multinational e-learning and providing action research-based evidences regarding the effectiveness of the process model and negotiation strategies, this study adds a new instructional design model which can address the particular needs and contextual variations of developing countries in establishing a sustainable multinational e-learning system to the existing knowledge base of instructional design. In particular, the proposed model conceptualizes and clarifies negotiation processes involved in multinational e-learning development.

In addition, by presenting twenty key factors affecting quality assurance of a multinational e-learning system, this study offers the developing countries which often lack e-learning experiences a quality check-list to ensure all the elements needed for quality e-learning development and implementation are considered.

Moreover, the issues and possible solutions identified in this study are likely to contribute to the development of e-learning policy for higher education in developing countries where doubt toward e-learning effectiveness is still prevalent and the infrastructure is quite limited.

Despite the aforementioned contributions, this study has some limitations. First of all, the proposed model was validated with a rather small number of students in only one participating institution and for one semester. To validate and further elaborate the process model for multinational e-learning, more program evaluation studies with more participating institutions from developing countries and for longer periods are needed.

The model proposed in this study and the multinational e-learning system did not include any mobile learning component. During the implementation, it was found that more than 60% of the students had a mobile phone. This calls for further research on integration of mobile learning in the model for multinational e-learning development.

Another limitation of the present study is that the proposed model does not integrate twenty key factors of quality e-learning. During the model implementation process, it became clear that these key quality factors should be tightly linked to each process of multinational e-learning development in order to assure the e-learning quality. Further research is needed to integrate quality factors in the processes of multination e-learning development.

There should be future research on the learning effectiveness of the multinational e-learning system using more elaborated research methods and instruments. In this study, an online survey was conducted at the end of the e-learning course and there were no comparison groups. In order to confirm the effectiveness of e-learning, pre- and post-treatment, control-treatment group comparison studies with more refined survey items are suggested.

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Attachment 1

Preference Survey Result

All four participating countries requested to open e-learning courses in IT and English. As for Korean and engineering, three participating countries wished to include them in the e-learning courses, while only two participating countries opted to offer e-learning courses in the subjects such as business, agriculture and foreign languages.

Table A1-1. *Areas Requested for Course Development* (MEST, 2012b, p. 19*)*

Cambodia	Laos	Myanmar	Vietnam
Business	Business		
IT	IT	IT	IT
Engineering	Engineering	Engineering	
Agriculture	Agriculture		
Korean	Korean		Korean
English	English	English	English
Korean Professor Engineering	Economics		e-Learning Conversion of Current Academic Classes
Special Lecture	Tourism		
	Foreign Language	Foreign Language	

Table shows the result of an investigation that explore the willingness of the participating universities whether they would like to take part in developing e-learning courses in each area of study. If a course was newly developed, it was labeled as 'NEW' whereas if the existing course was being supplemented or modified, it was labeled as 'Upgrade'. When the participating university requested the participation of professor who developed the courses, they were labeled as 'SME'. If there were more than two participating countries that were labeled as SME, one or two countries were selected as SME and were labeled as 'Final SME'. There was no participating university which included 'Agriculture' in their final list of e-learning courses.

Table A1-2. *Preference Survey Result* (MEST, 2012f)

Courses selected by more than 3 countries				
Area	Course Title	Countries	SME	FINAL SME
Business	NEW: Management Information System	C, L, M		ROK
	NEW: E-Business	C, L, M	L	ROK / Laos
Agriculture	None			
Languages	UP: Practical English	C, L, M	M	ROK
Engineering	NEW: Electric Circuit	L, M, V	V	ROK
	NEW: Data Structure	C, L, V	C, V, M	ROK
	NEW: Introduction to Operating System & Network	C, L, M	C	Cambodia
Courses selected by 2 countries				
Korean Studies *	UP: Introduction to Contemporary Korea in a Globalized World	C, L		ROK
	UP: Dynamic Korea, Exciting Hallyu	C, L		ROK
Engineering	NEW: Introduction to Circuit Theory and Laboratory	M, V	V, M	Vietnam
	NEW: Programming Language JAVA	L, V	V, M	Vietnam
Certificate Program	NEW: e-Learning Instructional Designer & Web Producer			ROK
	UP: ICT for Development			UN-APCICT

Twelve courses in five areas were made to the final list of the e-learning courses, which the participants agreed to develop (Attachment 2). They are in five areas of study: business, language, engineering, Korean language and the certificate course. One of the most noticeable things is that 5 out of 12 e-learning courses are in engineering, which reflects the characteristics of three engineering universities out of the four participating universities.

Attachment 2

Survey result of possibility to open e-learning courses

When managing the developed courses, the participating universities were asked whether they would need co-instructors and teaching assistants (Table A2-1). When it was difficult for the participating university to find local co-instructors, it was arranged through a meeting of the steering committee for the university to get help from the other participating universities to utilize their co-instructors.

Table A2-1 *Possibility to Open E-learning Courses* (MEST, 2012f, p1)

Area	Course Title	SME	Co-Instructor				Tutor				Opening for September Semester			
			A	B	C	D	A	B	C	D	A	B	C	D
Business	Management Information System	ROK *	O	O	O	O	O	O	O	O	O	O	O	O
	E-Business	ROK		O	O	O		O	O	O	O	O	O	O
Lang.	Practical English	ROK	O	O	O	O	O	O	O	O	O	O	O	O
Eng.	Electrical Circuit: Microelectronics	ROK		O	O	O		O	O	O	O	O	O	O
	Data Structure	ROK/ Myanmar		O	O	O		O	O	O	O	O	O	O
	Introduction to Computer System & Network	Cambodia	O	O	O	O	O	O	O	O	O	O	O	O
	Introduction to Circuit Theory and Laboratory	VIET NAM		O	O	O		O	O	O	O	O	O	O
	Programming Language (Java)	VIET NAM	O	O	O	O	O	O	O	O	O	O	O	O
Korean Studies	Introduction to Contemporary Korea in a Globalized World	ROK									O	O	O	O
	Dynamic Korea, Exciting Hallyu	ROK									O	O	O	O
Certificate Program	Introduction to e-Learning Study	ROK									O	O	O	O
	ICT for Development	UN-APCICT									O	O	O	O

Attachment 3

Standard of facilities criteria for distance education

According to the Facilities Criteria of MEST of ROK, there is a standard and requirements for the establishment of a cyber university in ROK. Each facilitates criteria on the Table below should be settled and satisfied. According to the Facilities Criteria of MEST of ROK, there is a standard and requirements for the establishment of a cyber university in ROK. There should be at least one teaching faculty and one TA per two hundred students. There is a minimum requirement for Campus facilities such as ICT equipment and campus sizes.

Table A3-1 *Standard of Facilities Criteria for Distance Education*

Area	Requirement	Note
Teaching Faculty	○ There shall be at least one (1) full-time professor for each major in a department or a college. The minimum number of instructors required for a department or a college is calculated by dividing the total number of students by 200 (round up decimal points). - The full-time professor is not only responsible for teaching major classes but also for management of the department such as curriculum development, academic affairs management and allocation of instructors. ○ The following shall be included when an establishment application is submitted: hired adjunct professors and part-time lecturers, and plans for class allocation for the hired faculty. - Adjunct professors teaching six (6) or more credit hours can be considered as one (1) faculty member specified in Paragraph 2, and the number of such professors shall not exceed one-fifth of total full-time professors. ○ Teacher's Assistants ("TAs") assist education, research and academic affairs at a cyber university, and each department or college shall hire at least one (1) TA. - The minimum number of TAs required for a department or a college is calculated by dividing the total number of students by 200.	Article 6. of "Code for Establishing and Operating a Cyber University"

<table>
<tr>
<td>Campus Facilities</td>
<td>○ The scope and area of campus facilities that shall be secured are stipulated.
○ The founder(s) shall have ownership of the facilities. Minimum size of area differs depending on a university's admission quota
<table>
<tr><th></th><th>Basic Facilities</th><th>Support Facility</th></tr>
<tr><td>Scope</td><td>University headquarters and administrative office, faculty research labs, lecture room, PC labs, seminar room, content development office.</td><td>Server and telecommunications operations office, system operations office, digital library</td></tr>
<tr><td>Area</td><td colspan="2">◦ Minimum land area required per admission quota
- Fewer than 1,000 : 990 m^2
- 1,000–1,999: 1,485 m^2
- 2,000–2,999: 1980 m^2
- More than 3,000: 2,475 m^2</td></tr>
</table>
</td>
<td>Article 5. of "Code for Establishing and Operating a Cyber University"</td>
</tr>
<tr>
<td>Distance Learning Facilities</td>
<td>○ A cyber university shall be equipped with the facilities required for distance learning including servers and telecommunications and content development systems. Specific matters on the distance learning facilities shall be determined and announced by the Minister of Education, Science and Technology considering the number of students calculated by each Clause under Article 6. Paragraph 3.
○ Refer to Appendix 1 (Distance Learning Facilities Criteria (Minister of Education, Science and Technology Announcement 2008-93, April, 22, 2008)</td>
<td>Article 5. of "Code for Establishing and Operating a Cyber University"</td>
</tr>
<tr>
<td>Basic Properties for Profit</td>
<td>○ The founder of a cyber university shall secure basic properties for profit worth 50% of total profits generated from annual accounting operations of an academic year (tuition and other revenue – transferred money and endowment). In any case, however, at least KRW 3.5 billion worth of basic properties for profit shall be secured.
- Basic properties for profit refer to the properties that can generate an annual revenue worth of 3.5% or more of the total profits.
- Types of basic properties for profit
1. Real-estate
2. Original property under articles of association
3. Properties incorporated into original property by board of directors' decision
4. Reserves such as retained earnings belonging to educational foundation for every fiscal year</td>
<td>Article 7. of "Code for Establishing and Operating a Cyber University"</td>
</tr>
</table>

Source: MEST, 2008 [22]

[22] Standards for facilities criteria for e-learning. Notification No. 2008-93 of the Ministry of Education, Science and Technology, Republic of Korea.

There is a minimum requirement of servers and network equipment which clarifies the basic and additional requirement for the extension of installation based on the increase of a student number.

Table A3-2 *Facilities Standard based on Student Numbers*

Number of Students	Facilities Standard based on a student number			
	OLTP Server [tpmC]	WEB Server [OPS]	Memory [MB]	Disk [GB]
1,000	34,500	6,000	14,336	4,950
2,000	69,000	12,000	28,672	9,900
3,000	103,500	18,000	43,008	14,850
4,000	138,000	24,000	57,344	19,800
5,000	172,500	30,000	71,680	24,750
6,000	207,000	36,000	86,016	29,700
7,000	241,500	42,000	100,352	34,650
8,000	276,000	48,000	114,688	39,600
9,000	310,500	54,000	129,024	44,550
10,000	345,000	60,000	143,360	49,500
11,000	379,500	66,000	157,696	54,450
12,000	414,000	72,000	172,032	59,400
13,000	448,500	78,000	186,368	64,350
14,000	483,000	84,000	200,704	69,300
15,000	517,500	90,000	215,040	74,250

Source: KERIS, 2012, p.34

Attachment 4

Individual Interview of representatives of each university

1) Dr. A from University A

- Current Progress
  - University A firstly started e-learning in 2005. Thanks to the e-Learning center which was supported by ROK, internet access for students became more equal. In September semester, 3 ACU courses have operated as the credit course; Management Information System, e-Business, and Data Structure.

- Challenges

- In order to promote the ACU project, we have some challenges; Culture, Infrastructure and Policy, etc.
  - The awareness on e-learning among students and even parents is cultural barrier to promote e-learning in my country
  - Internet access and infrastructure still have limitations for the promotion of e-learning
  - ITC is the university specialized in engineering. Engineering study should operate practical courses students come to on-site class
  - National policy is not ready to set up degree courses on line. Also ITC has to mandate regulations to operate ITC center not only for ITC but also other public institutions

- For the project, there are also challenges all members need to discuss
  - Regarding the common academic calendar, only initial members still has difficulty to make common calendar, it will become the one of critical issues when more members are added.
  - Students rarely have motivation to register the ACU course which is developed by SME from other countries.
  - In University A, since not all students are good at speaking English, university should decide which section, level of students the ACU project targets.

- Although Quality assurance is one of the big issue, Seoul Cyber University has experiences on this issue

➢ Question & Answer

- Dr. D from University D wants to know how University A gets the permission to operate ACU courses as the credit course from the government. Dr. A from University A explained that University A regarded the ACU credit transfer as the similar case of current exchange program. It was very similar with current exchange program but operated online

2) Dr. B from University B

➢ Current Progress

- University B has condition to operate credit transfer among students but it is not for e-learning, it is only for traditional way of study
- According to current regulation, it must be considered by destination department to accept courses for credit transfer

➢ Challenges

- In order to promote the ACU project, there are some challenges making students from Country B hesitated to register ACU courses
    - Due to academic capacity, students worry that they couldn't get higher score when they choose ACU courses
    - Since students wants close relationship and efficient communication with lectures, the ACU has to support relevant system
    - If tuition fee of ACU course are higher than local university, it makes the motivation of students lower

- University A and ACU project should discuss how to get over several challenges member university faces
    - The effort for increasing awareness on e-learning is important
    - The collaboration among CLMV and ROK led by the ACU project should be strengthened for the efficient operation

- Each member university should have regulations and policy for encouraging local students to register ACU courses, promoting credit transfer program and other collaborative project CLMV, ASEAN, ROK could promote

- Considering existing regulations of each state, ACU members should design which could support e-learning and cyber education

➢ Question and Answer

- The secretary kindly request that the ACU secretariat had has many problems to get response when they collect local syllabus from member universities. Quick and immediate response is the very important for the cooperation project.

3) Dr. C from University C

➢ Current Progress

- e-Learning Center construction in University C was completed in July.
- Rules and regulations have been under discussion.
- e-Learning contents development including simulation and modeling has been work-on-progress since June, expected to be completed in November in year of 2012.

➢ e-Learning Center Policy

- Addressed goals, future plan, main business, organization & function, and e-learning & class operation.

➢ Problems, Limitation and Requested Assistance

- Errors in LMS

➢ Assistance Request

- Technological problems addressed should be assisted as well as building durable facility of e-learning system.

4) Dr. D from University D

➢ Challenges

- No official regulation from government

- Academic calendar difference: Fall semester of HUST started on August 13, 2012, 5 weeks prior to ACU semester.
- Language barrier
- Quality

  As one of SMEs of ACU Project, Dr. T at University D shared his participation in contents development in Korea. He concerned that interaction between professors and students would be less sufficient than offline lecture.
- Work pressure to SME

  Writing script and recording/filming require time commitment. More amount of work would interrupt quality of course as the Project expands.

Attachment 5

E-learning Satisfaction Survey

Please fill in the blank OR put √ to indicate the extent to which you agree or disagree with the following statements:

Part 1

1. I am a student of _____ University, majoring in _____.

2. Gender: Male ( ) Female ( )

3. What age group are you in?
   A. 19 and under ( )
   B. 20 - 29 ( )
   C. 30 - 39 ( )
   D. 40 - 49 ( )
   E. 50 or more ( )

4. If you have a job apart from student, write down with details _____

5. Where do you mainly work at the computer?
   A. At home with your own PC ( )
   B. At the university ( )
   C. Others ( ) Please, write with details _____

6. How long do you work at the computer per day?
   A. Less than 1 hour ( )
   B. 1-2 hour(s) ( )
   C. 3-4 hours ( )
   D. Over 5 hours ( )

7. How many days do you work at the computer per week?
   A. Everyday ( )
   B. 2 days ( )
   C. 3-4 days ( )
   D. When I have to use a computer ( )

8. What do you usually do while working at the computer?
   A. Academic work or assignment ( )
   B. Word-processing ( )
   C. E-mail or personal work ( )
   D. Others ( ) Write with details_____

9. How many hours do you study on-line per day?
   A. Less than 1 hour ( )
   B. 1-2 hour(s) ( )
   C. 3-4 hours ( )
   D. Over 5 hours ( )

10. I have accessed to on-line classes outside of school.
A. Yes B. No

11. If yes, how many times have you accessed per week?
A. 1~5 times
B. 6~10 times
C. 11~15 times
D. More than 16 times

12. How fast does the program run?
A. Very slow
B. Slow
C. Fast
D. Very fast

13. I possess a computer.
A. Yes B. No

14. If yes, what kind of computer do you have?
A. Desktop computer
B. Laptop computer
C. CPU and memory? (/)

15. I access to the Internet outside of school.
A. Yes B. No

16. If yes, how do you access?
A. (A)DSL (monthly expenditure: USD)
B. 3G (smart phone ( ), modem ( )) (monthly expenditure: USD)
C. Internet cafe
D. Free wi-fi

Part II

	statement	Strongly agree	agree	neutral	disagree	Strongly dis-agree
1	I'm good at collecting information I want by using search engines.					
2	I'm good at using SAVE, Un-zip or Zip various kinds of files.					
3	I'm good at using Word-processing (Create, Edit, etc.).					
4	I'm good at making, revising, editing text/presentation files that include multimedia materials (video, music or picture).					
5	I have knowledge about computer virus, hacking damages and how to protect personal information.					
6	This e-learning system is easy to use.					
7	I am in control of the contents of e-learning (following the instructions such as going over the next slides, doing the quiz, viewing the scripts).					

	statement	Strongly agree	agree	neutral	disagree	Strongly dis-agree
8	Getting started with this e-learning system is easy.					
9	This e-learning material is engaging. (I'm spending quite a time with this e-learning material)					
10	I think I'm learning with this e-learning system.					
11	Navigating through the given menu is easy to do.					
12	The contents of e-learning match my needs.					
13	Finding the options that I want in the e-learning system is easy.					
14	Screen layout (e.g. going to NEXT page, play control bar, speed control) is easy to use.					
15	This e-learning course provides clear instructions (e.g. lesson goal, quiz or summary, main contents).					
16	The instruction of the contents is easy to follow.					
17	The level of difficulty of the program is appropriate.					
18	The e-learning system has motivated me to learn.					
19	The contents and scripts are adequate to understand.					
20	The quiz and evaluation are good to review.					
21	The evaluation has properly checked if I learned the contents.					
22	I have done my best to complete the contents through the e-learning system.					
23	I have talked about the e-learning and its contents with other people or learners.					
24	I have concentrated on learning in this e-learning system.					
25	I generally feel satisfied with learning in this e-learning system.					
26	I'd like to take additional course in this e-learning system.					
27	I'd like to recommend other learners to take this e-learning course.					
28	Satisfaction in e-learning system stability					
29	Learning effectiveness					
30	Downloading and streaming are appropriate to learning Video lectures.					
31	Hardware infrastructure such as computers and the Internet connection are appropriate for e-learning.					
32	Satisfaction in Support by co-instructor and teaching assistant.					
33	Satisfaction in support from the university and the project members.					

Part III

34. Do you think e-learning is going to be expanded for the future?

A. Very reduced B. Reduced C. Similar D. Expanded E. Very expanded

35. What kinds of difficulties should be improved to expand e-learning?
Please choose three and mark V on it.

A. Learning effectiveness
B. Reliability of e-learning system
C. Evaluation Methods
D. Quality assurance
E. Guidance to e-learning and course information
F. Support for using e-learning system
G. Interaction between learners and instructors and/or among learners
H. H/W equipment such as computers and the Internet
I. Educational policy and support

36. What kinds of learning activities should be reinforced to improve learning effectiveness?

A. Online lecture
B. Offline lecture
C. Debate
D. Project based learning
E. Practicing/Simulation
F. Others _____

- Thank you very much -

Attachment 6

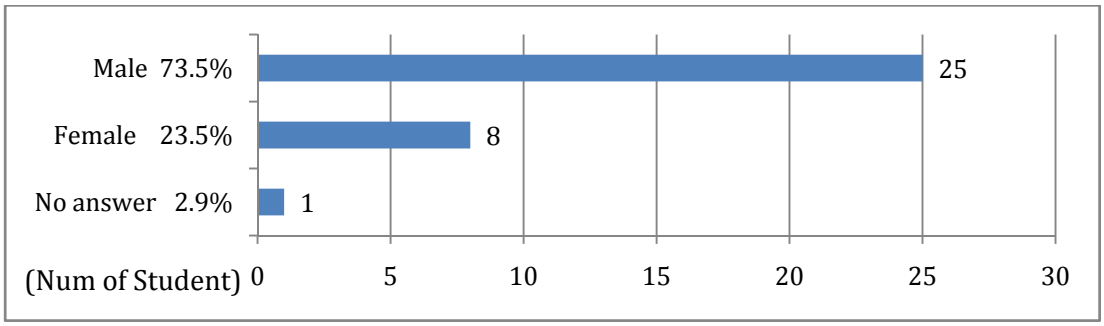
Result of the users' satisfaction survey

Part I.

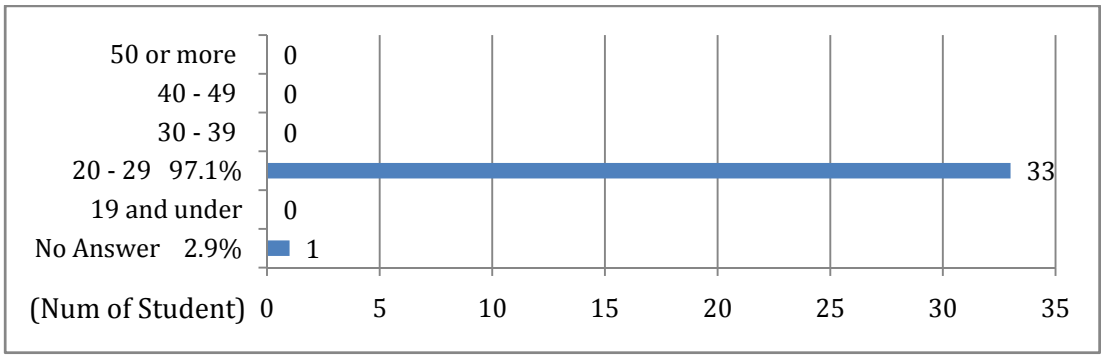
1. I am a student of _____ University, majoring in _____.

Undergraduate students 2nd year, Computer science

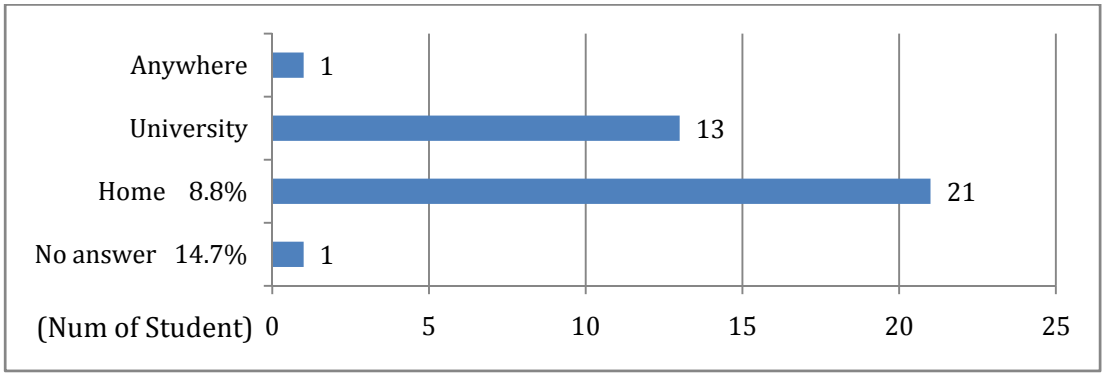
2. Gender:



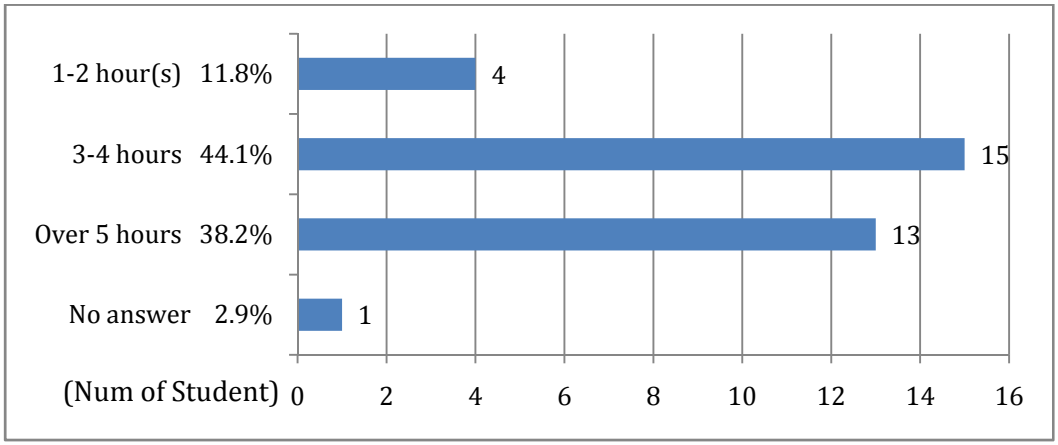
3. What age group are you in?



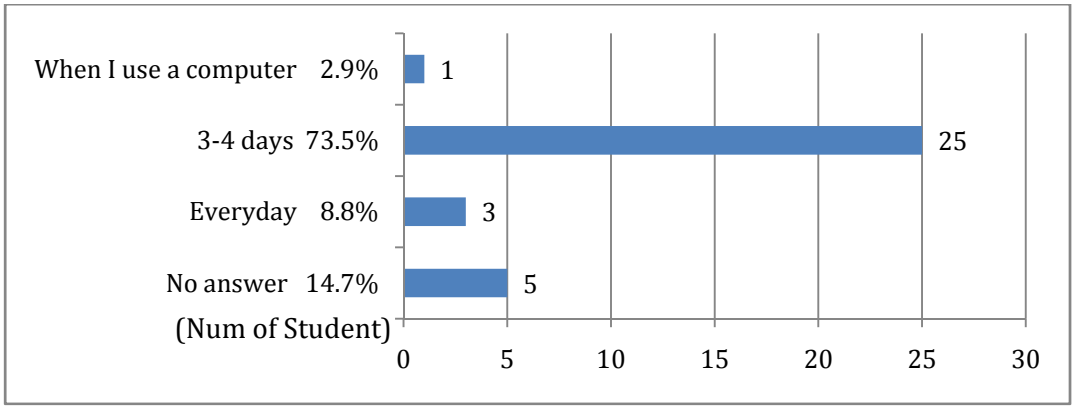
5. Where do you mainly work at the computer?



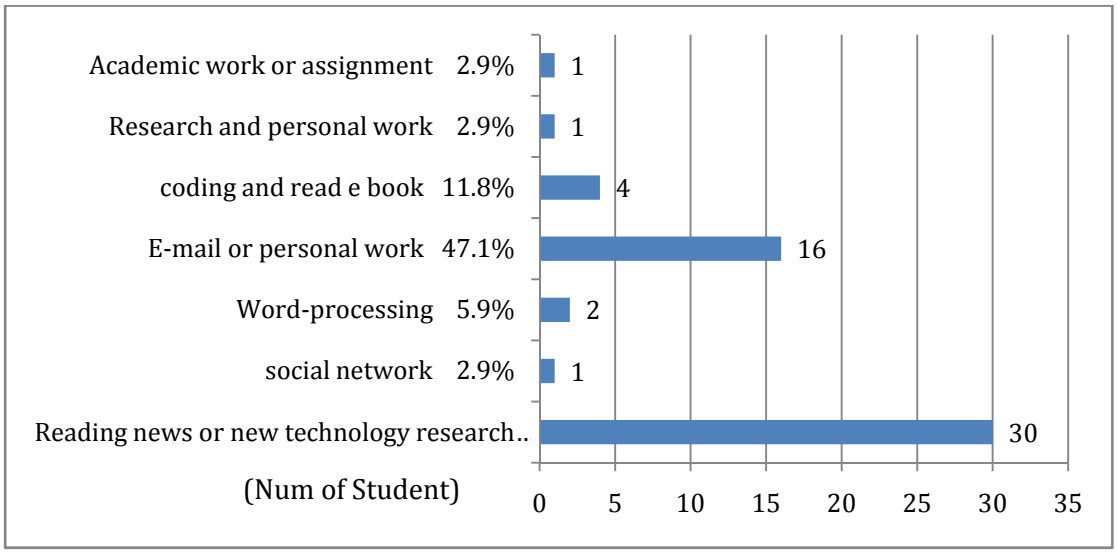
6. How long do you work at the computer per day?



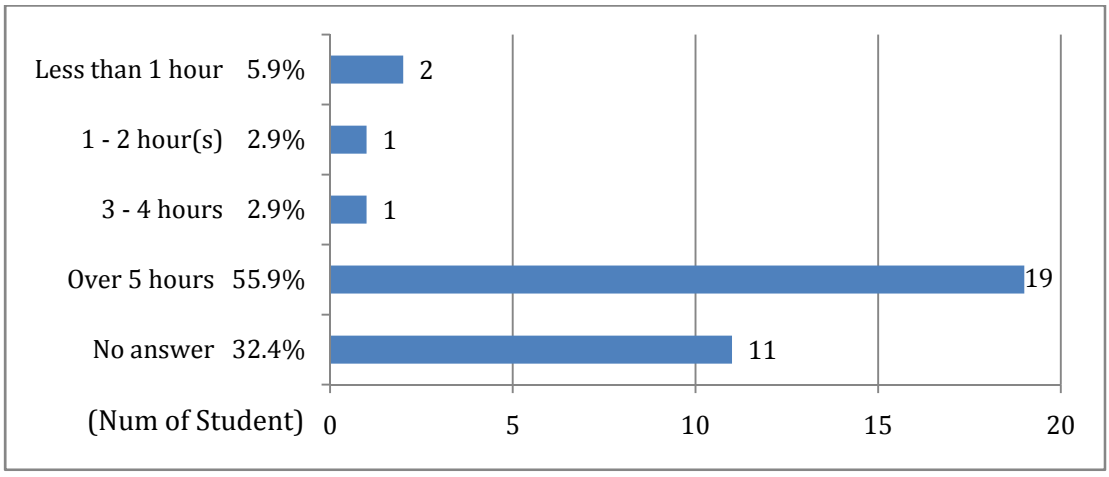
7. How many days do you work at the computer per week?



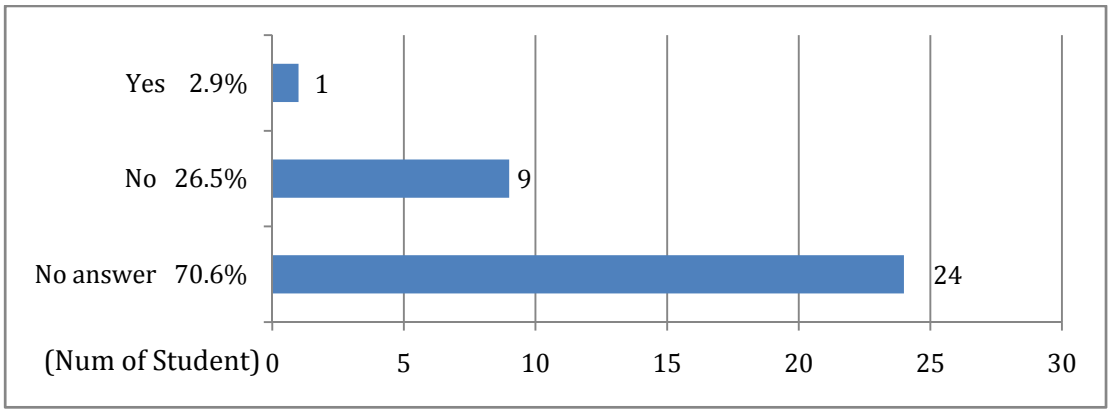
8. What do you usually do while working at the computer?



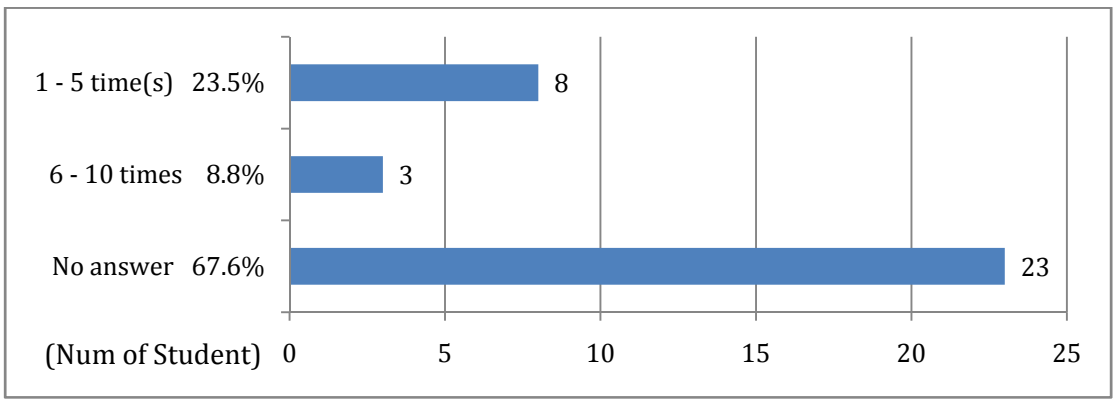
9. How many hours do you study online per day?



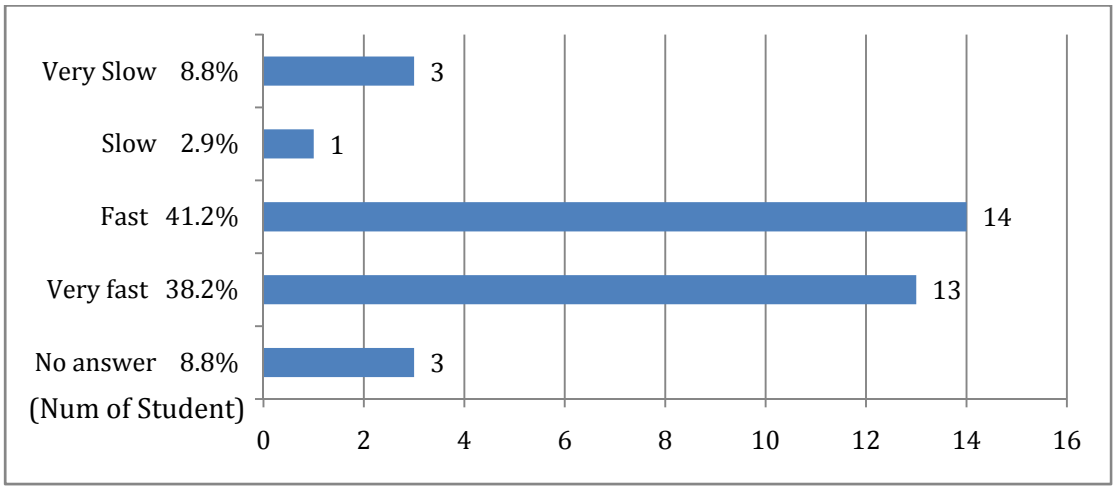
10. I have accessed to online classes outside of school.



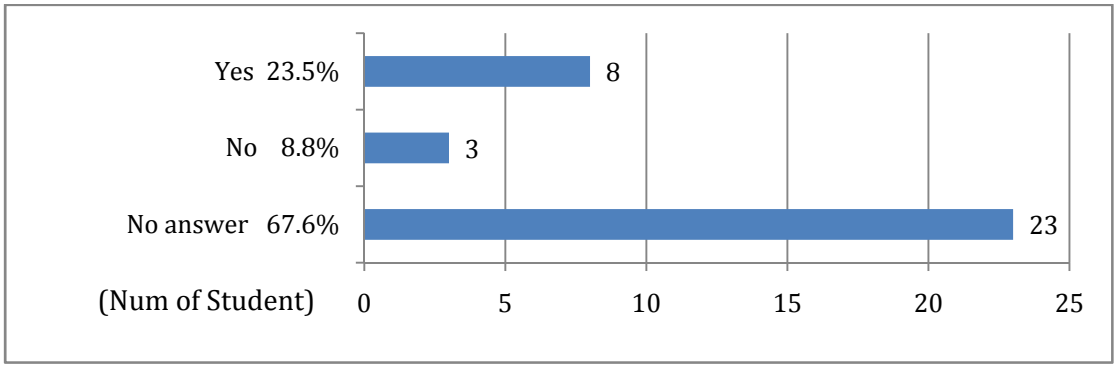
11. If yes, how many times have you accessed per week?



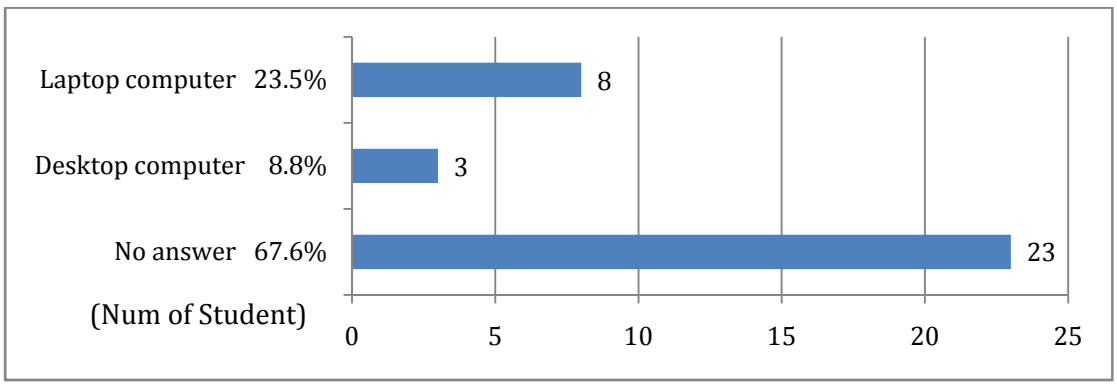
12. How fast does the program run?



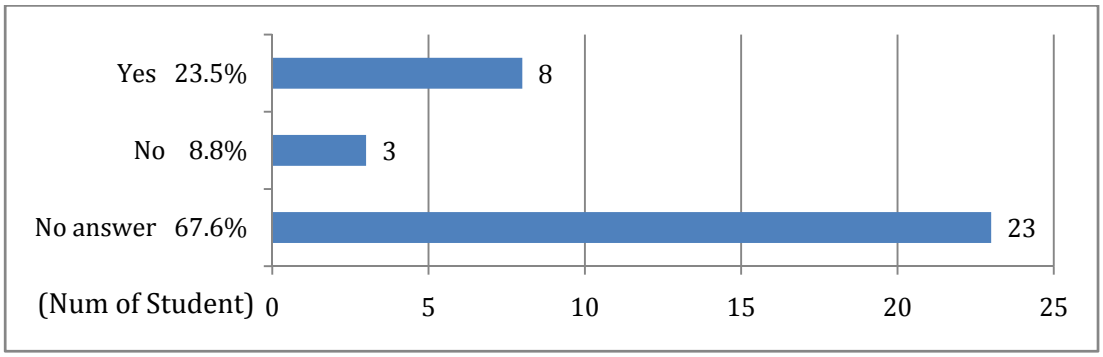
13. I possess a computer.



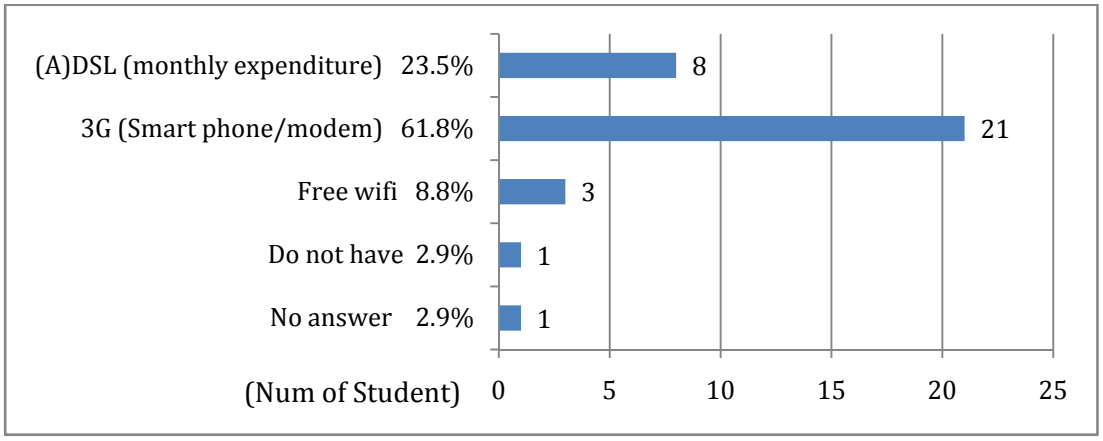
14. If yes, what kind of computer do you have?



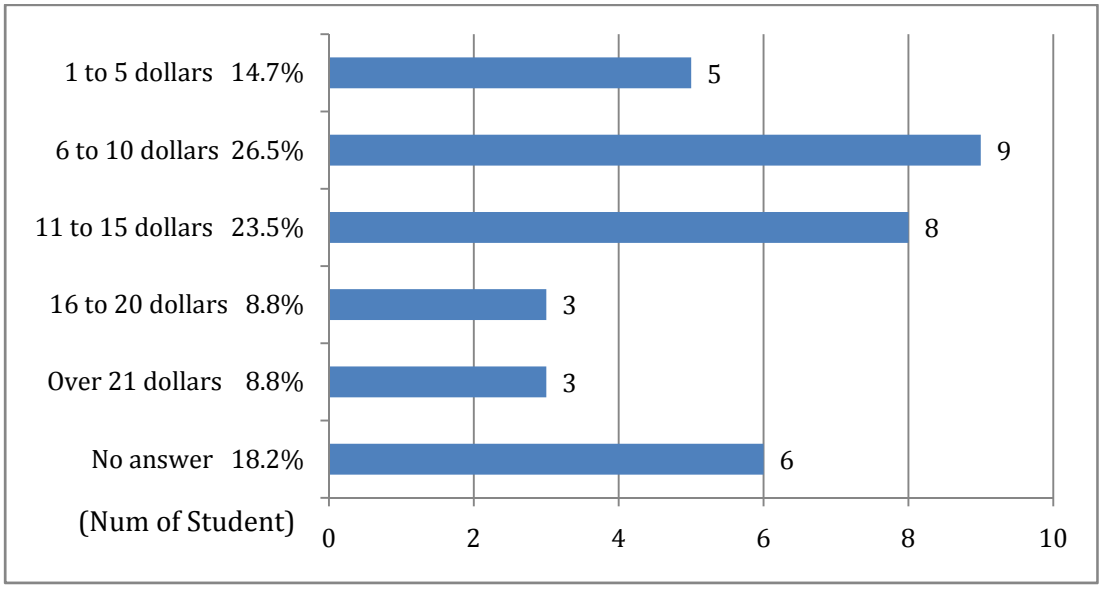
15. I access to the internet outside of school.



16. If yes, how do you access?

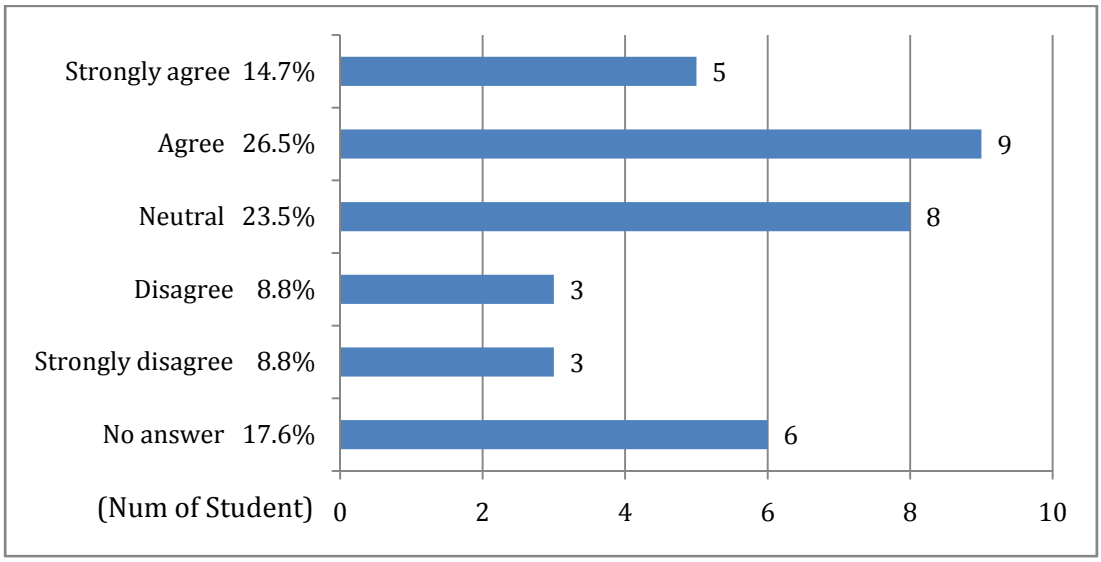


17. Monthly expenditure: _____ USD

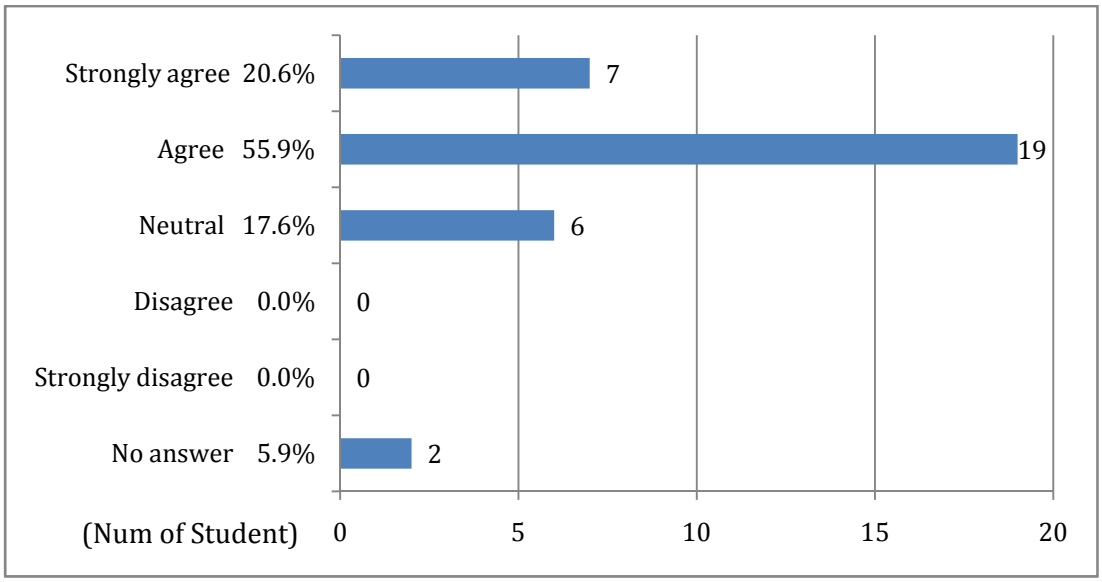


Part II

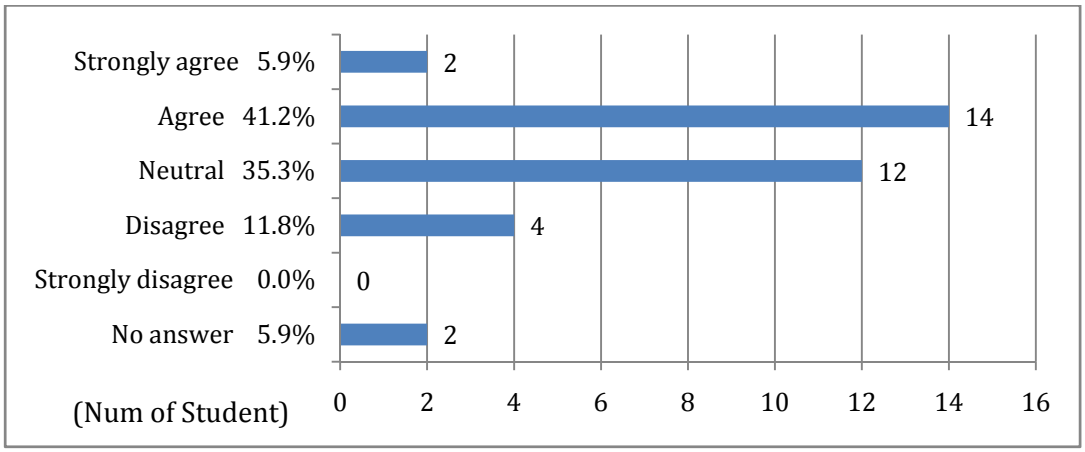
1. I'm good at collecting information I want by using search engines



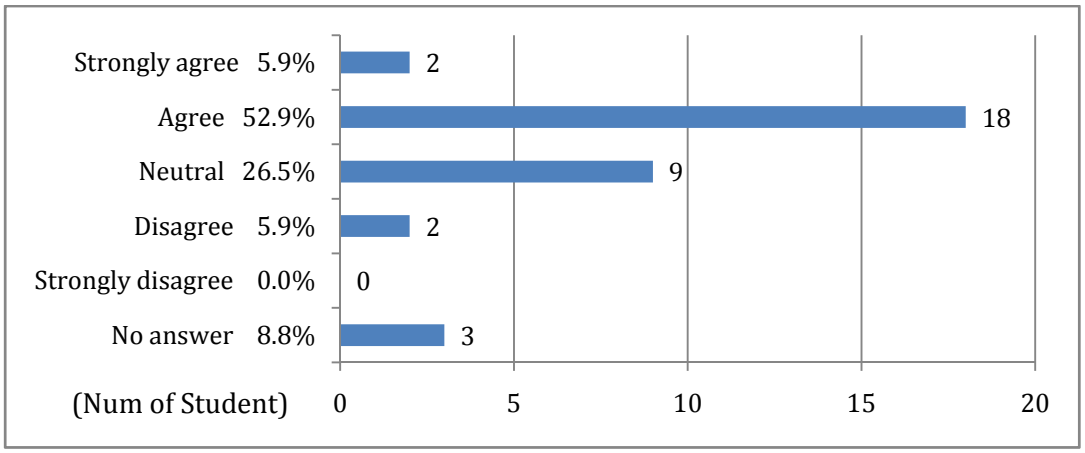
2. I'm good at using SAVE, Un-zip or Zip various kinds of files.



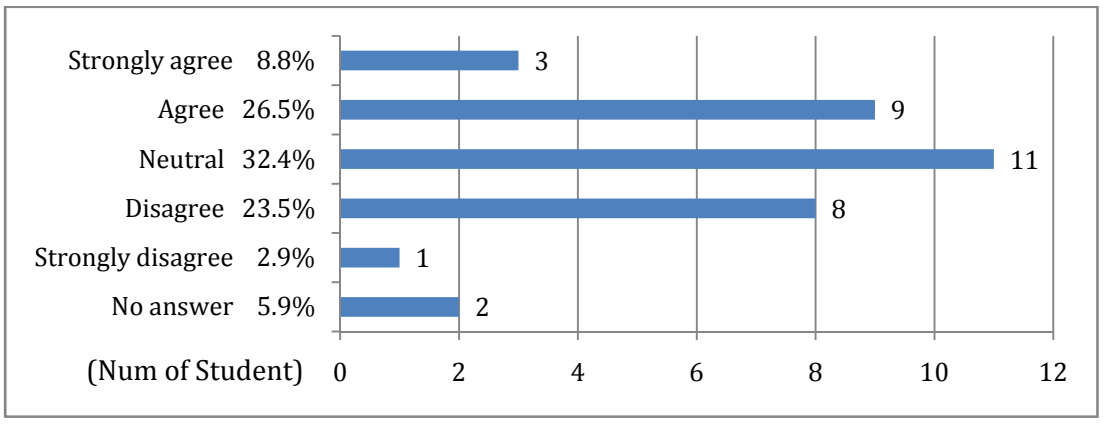
3. I'm good at using Word-processing (Create, Edit, etc.).



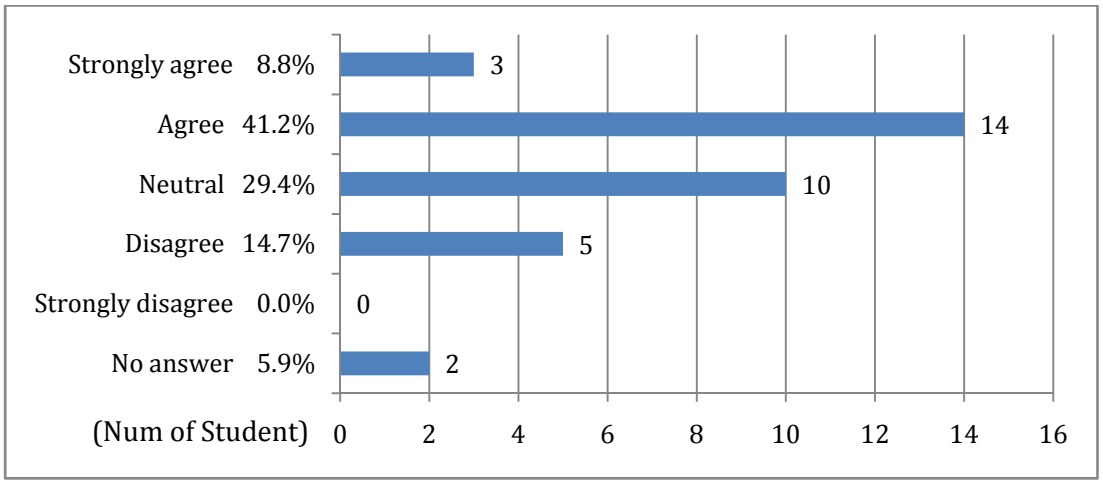
4. I'm good at making, revising, editing text/presentation files that include multimedia materials (video, music or picture).



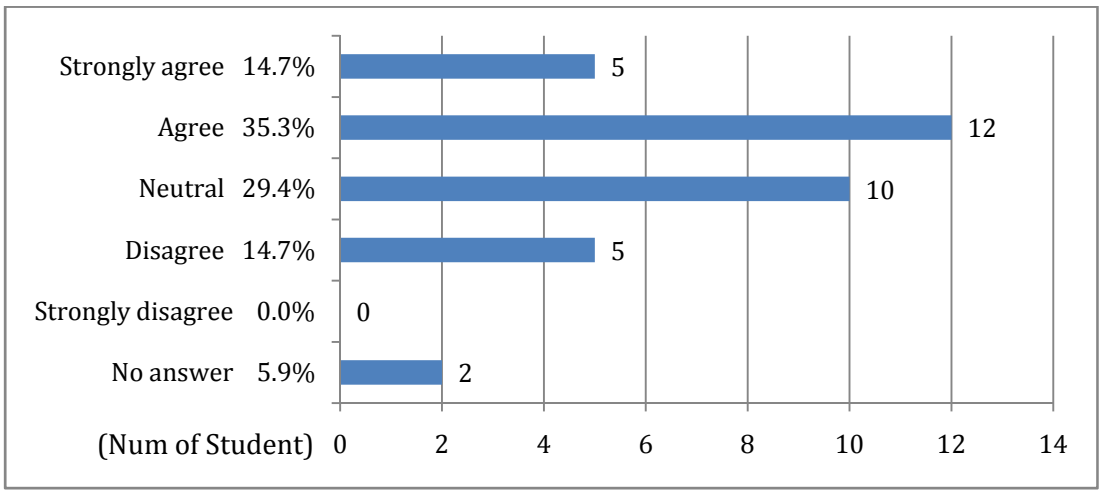
5. I have knowledge about computer virus, hacking damages and how to protect personal information.



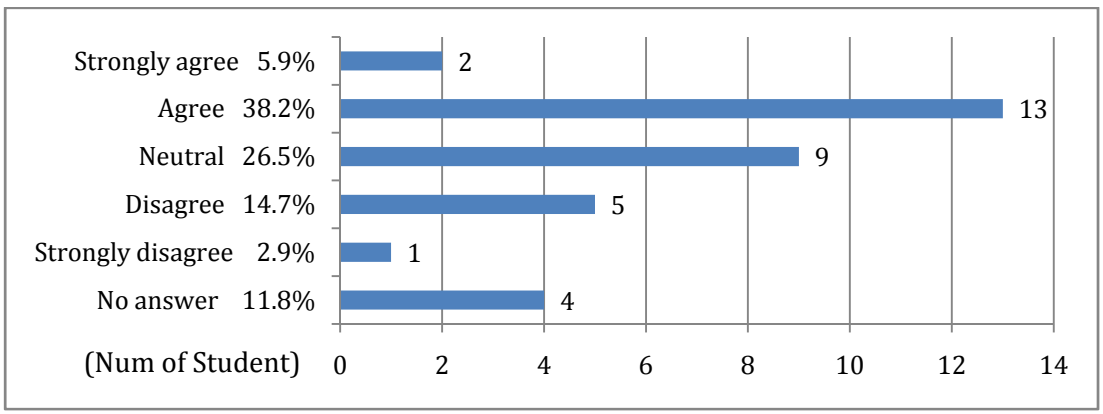
6. This e-learning system is easy to use.



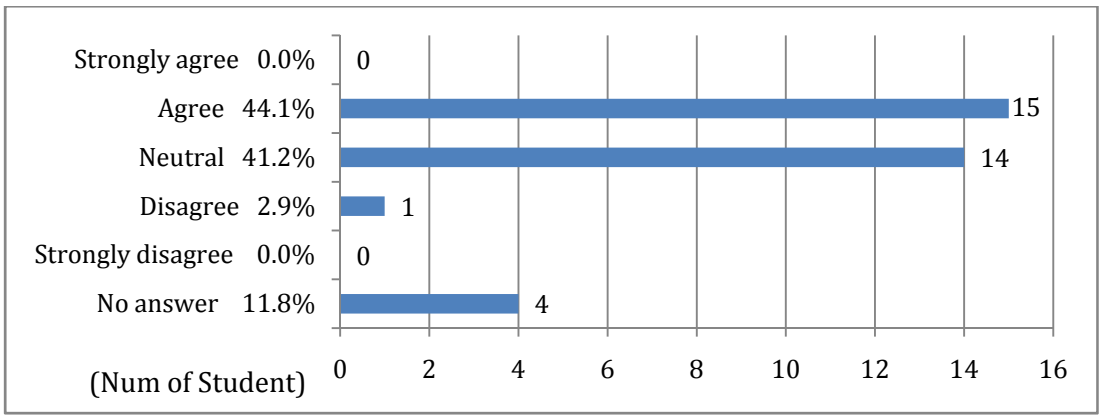
7. I am in control of the contents of e-learning (following the instructions such as going over the next slides, doing the quiz, viewing the scripts).



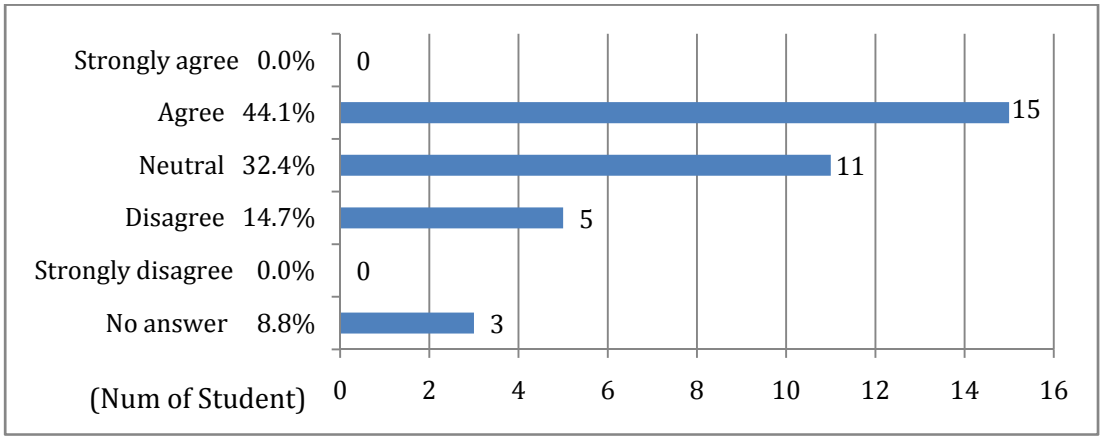
8. Getting started with this e-learning system is easy.



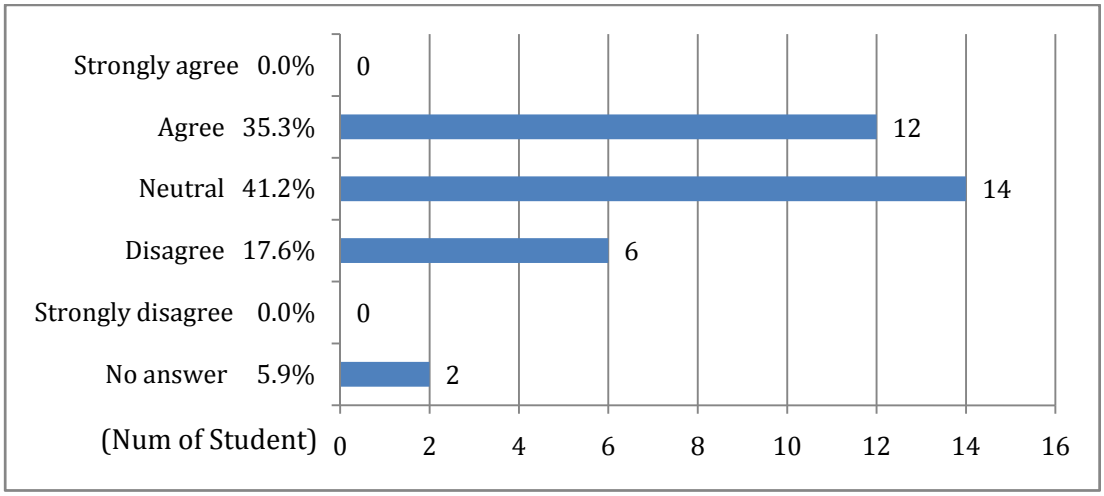
9. This e-learning material is engaging. (I'm spending quite a time with this e-learning material)



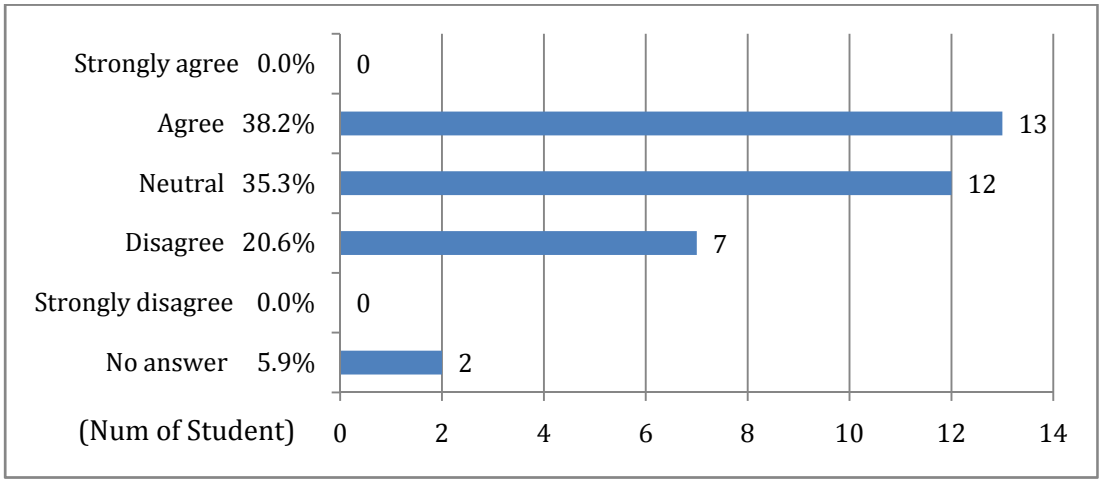
10. I think I'm learning with this e-learning system.



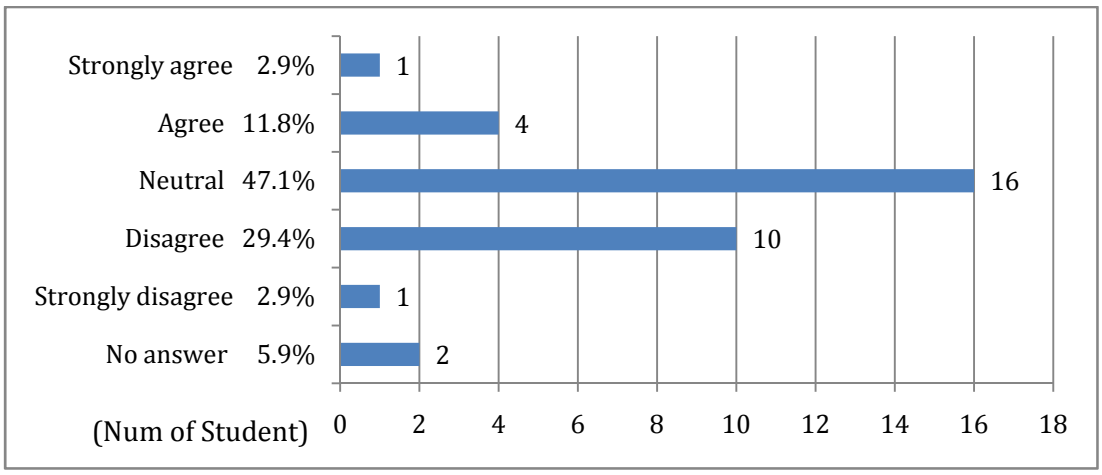
11. Navigating through the given menu is easy to do.



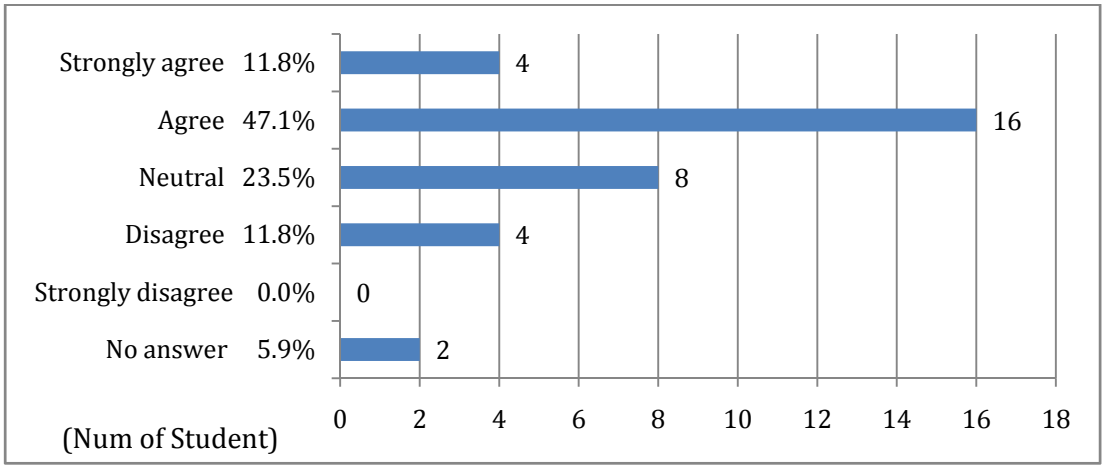
12. The contents of e-learning match my needs.



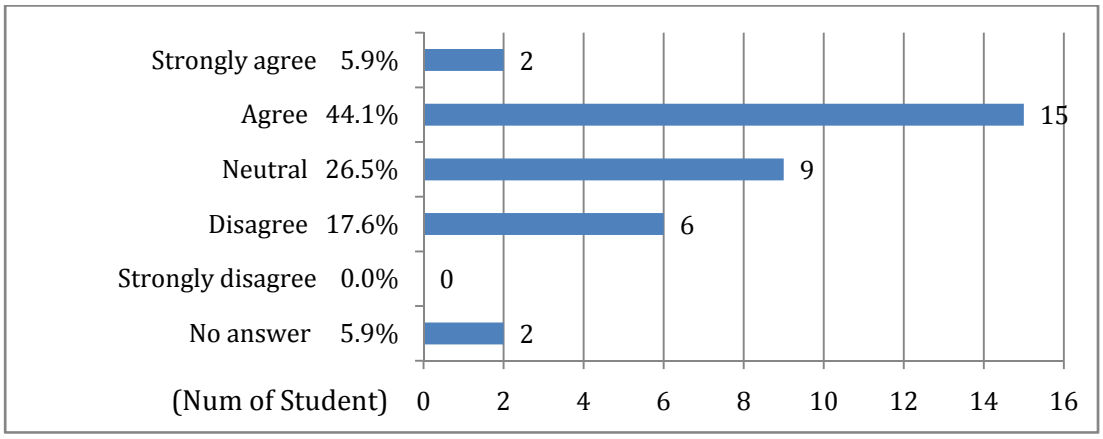
13. Finding the options that I want in the e-learning system is easy.



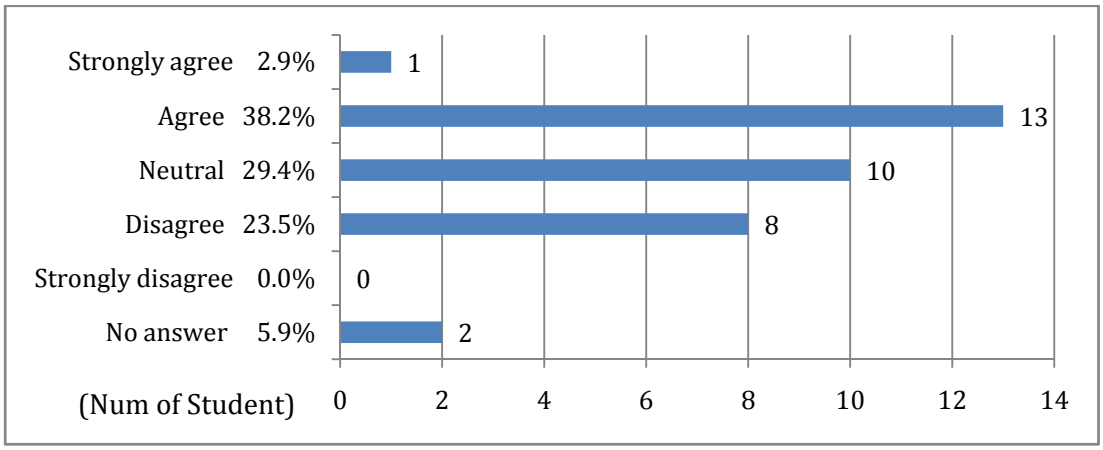
14. Screen layout (e.g. going to NEXT page, play control bar, speed control) is easy to use.



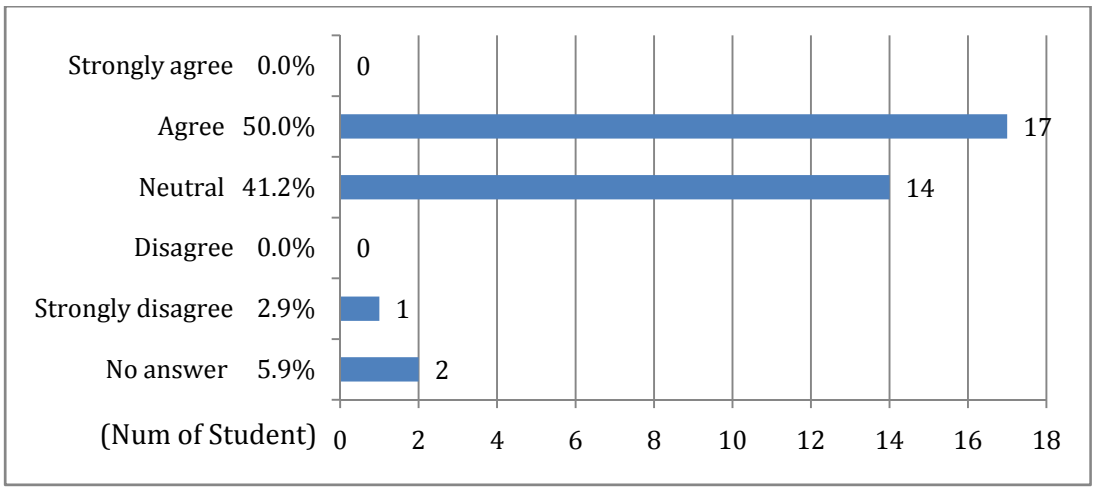
15. This e-learning course provides clear instructions (e.g. lesson, goal, quiz or summary, main contents).



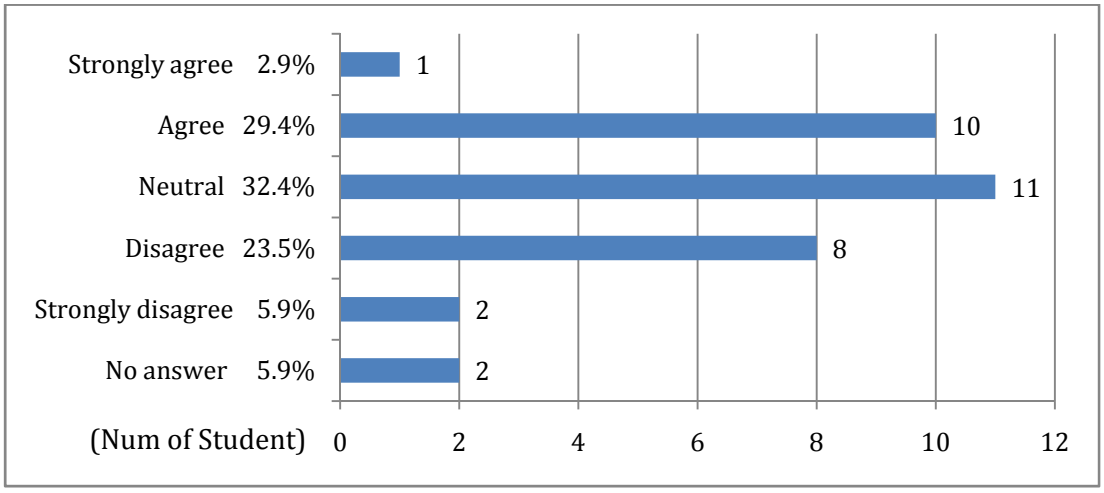
16. The instruction of the contents is easy to follow.



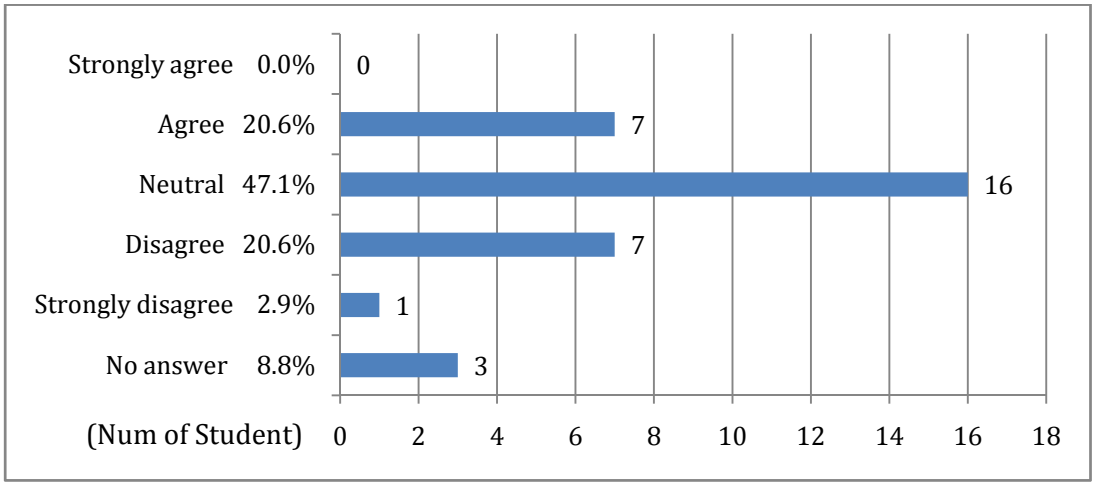
17. The level of difficulty of the program is appropriate.



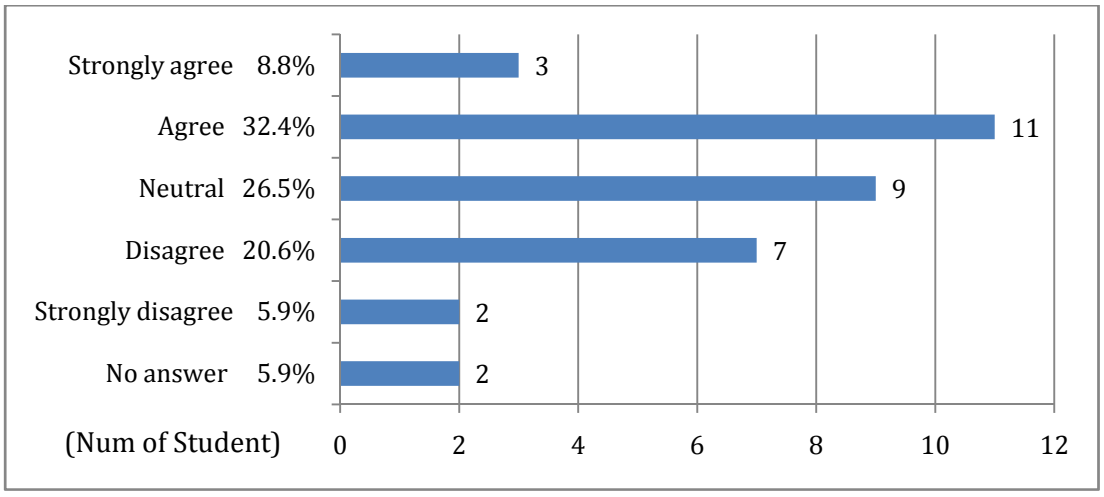
18. The e-learning system has motivated me to learn.



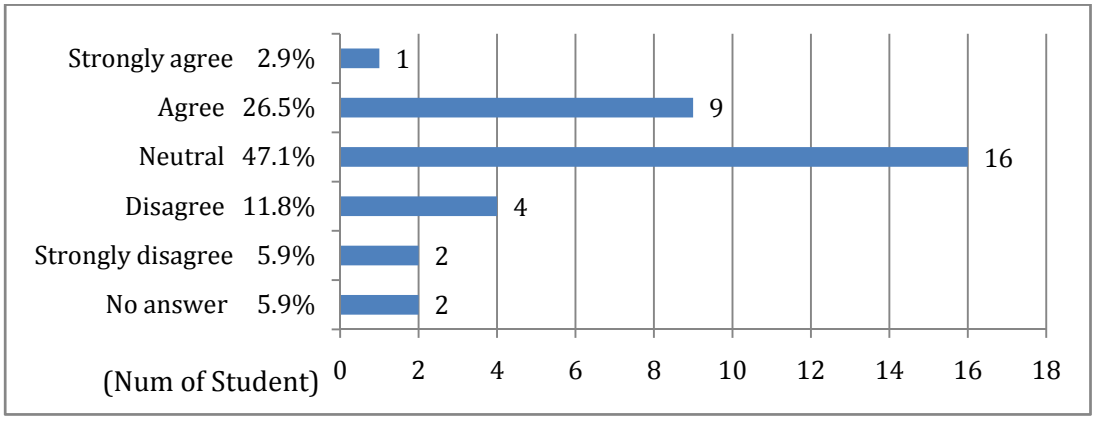
19. The contents and scripts are adequate to understand.



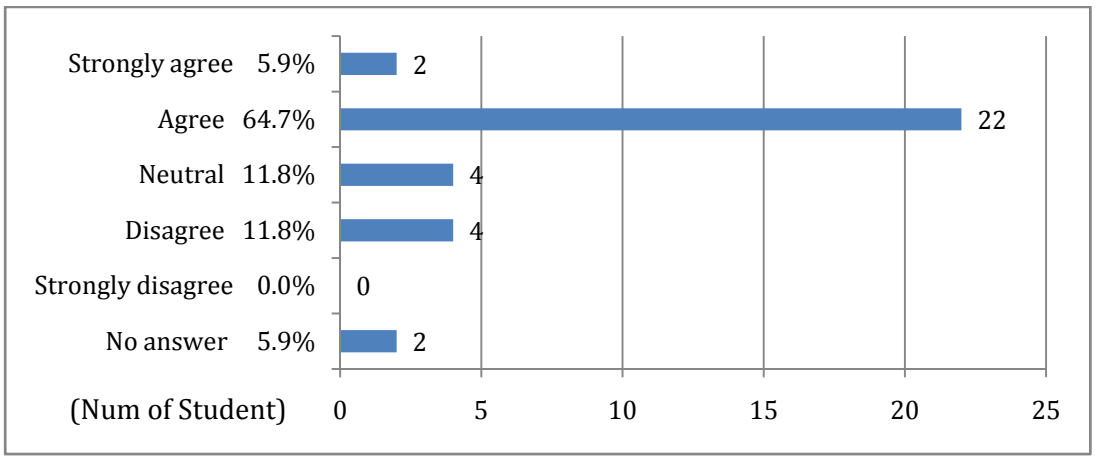
20. The quiz and evaluation are good to review.



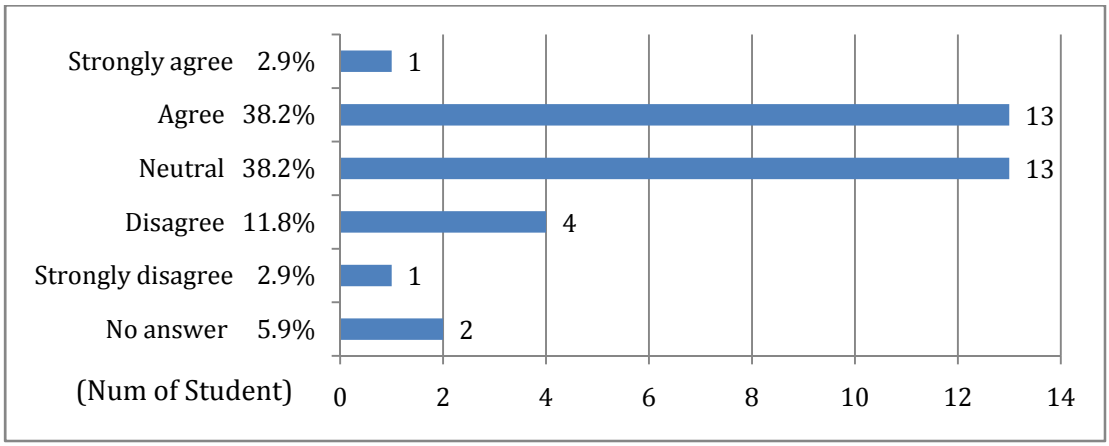
21. The evaluation has properly checked if I learned the contents.



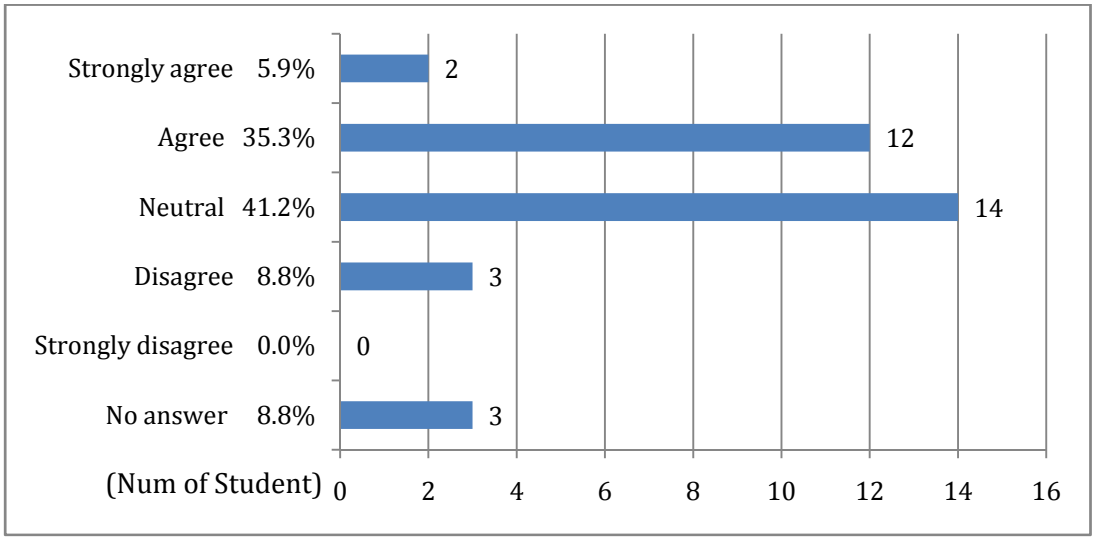
22. I have done my best to complete the contents through the e-learning system.



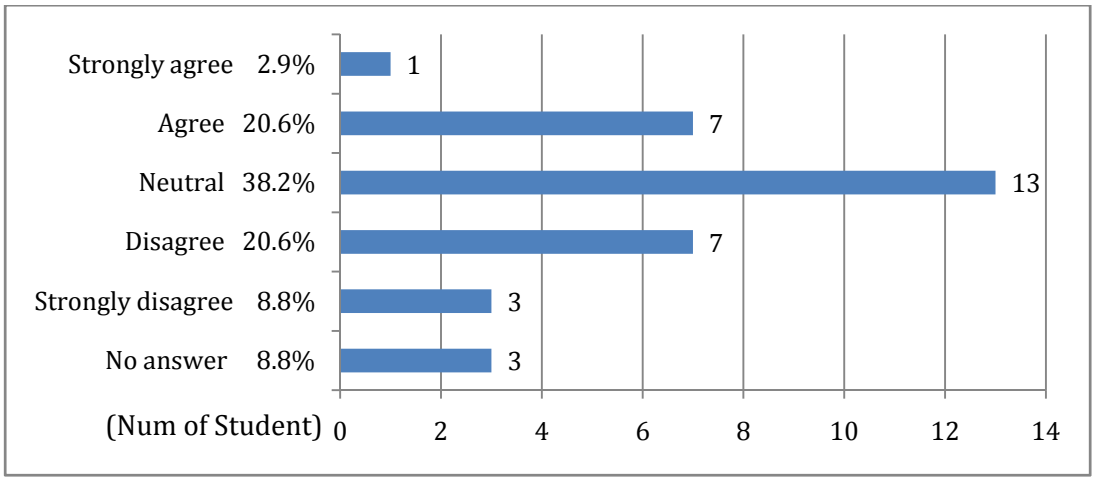
23. I have talked about the e-learning and its contents with other people or learners.



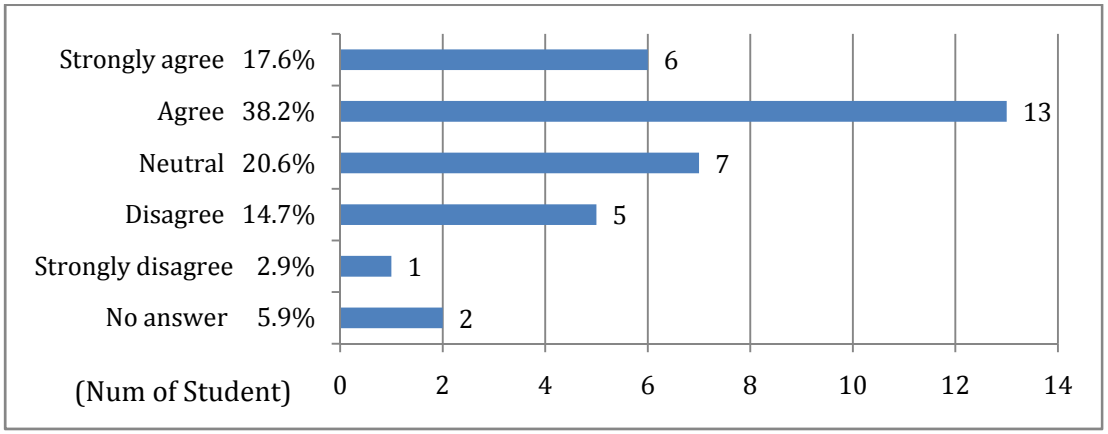
24. I have concentrated on learning in this e-learning system.



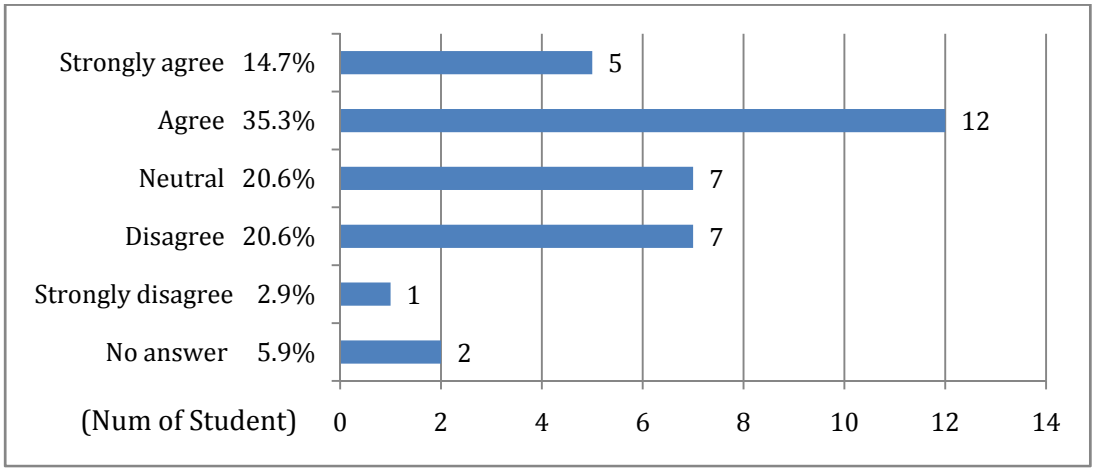
25. I generally feel satisfied with learning in this e-learning system.



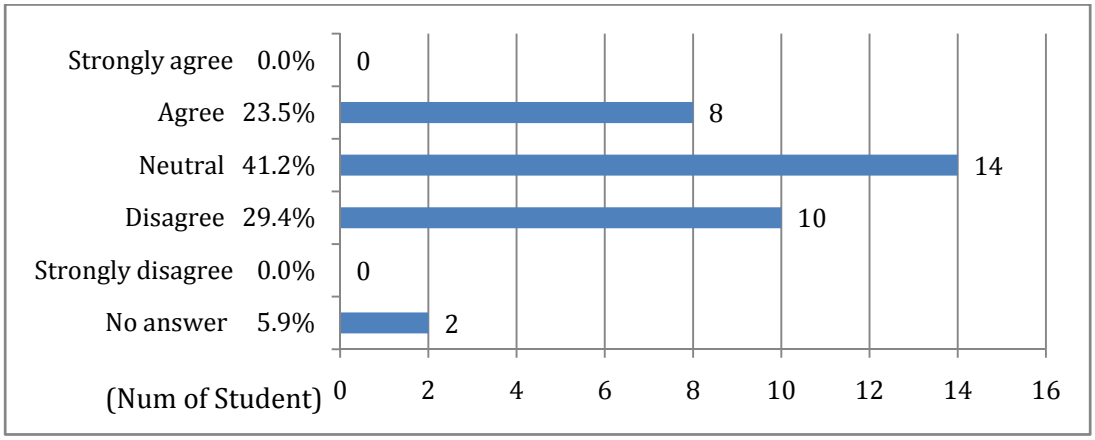
26. I'd like to take additional course in this e-learning system.



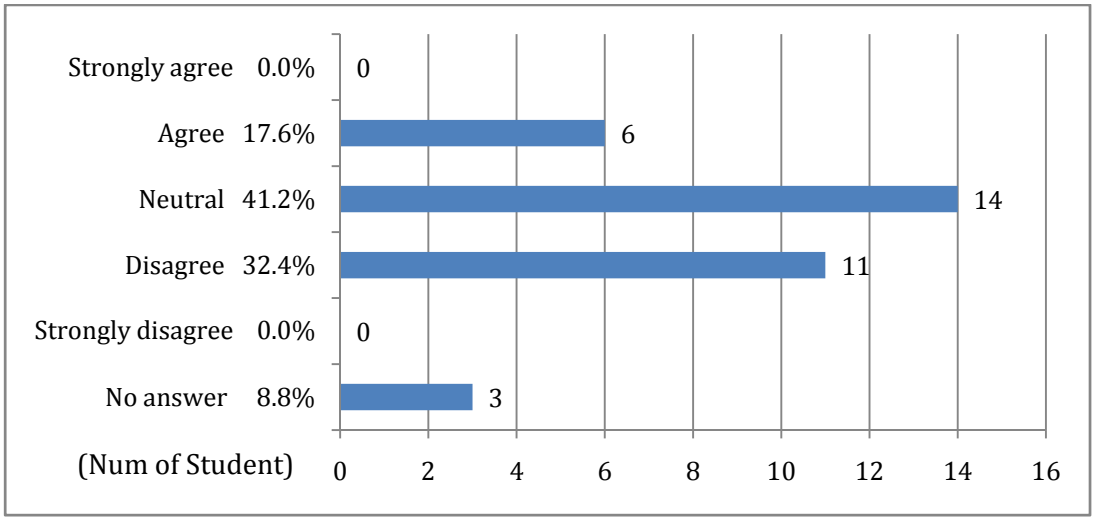
27. I'd like to recommend other learners to take this e-learning course.



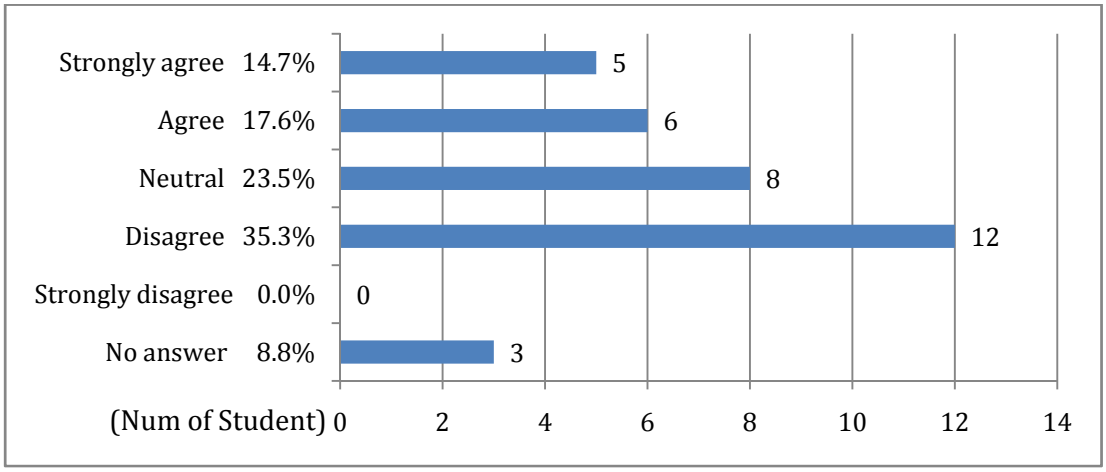
28. Satisfaction in e-learning system stability



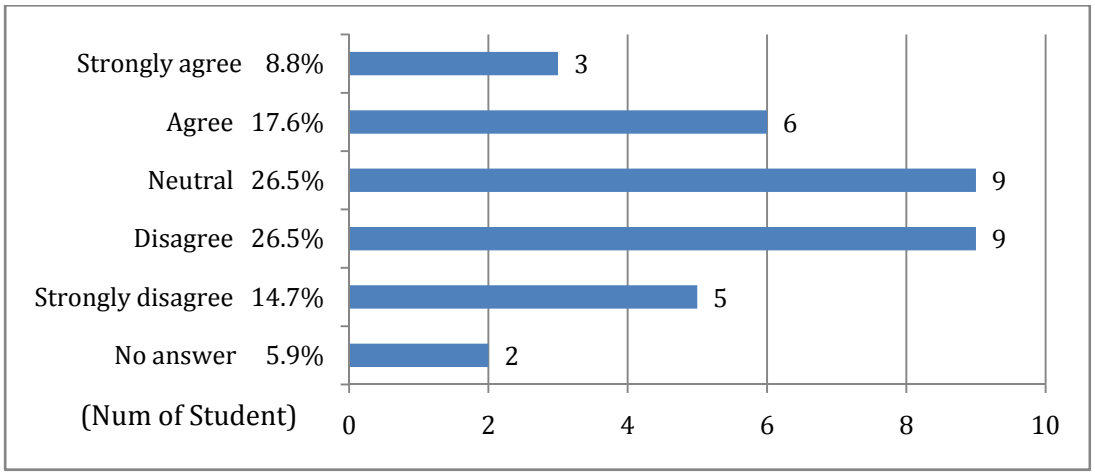
29. Learning effectiveness



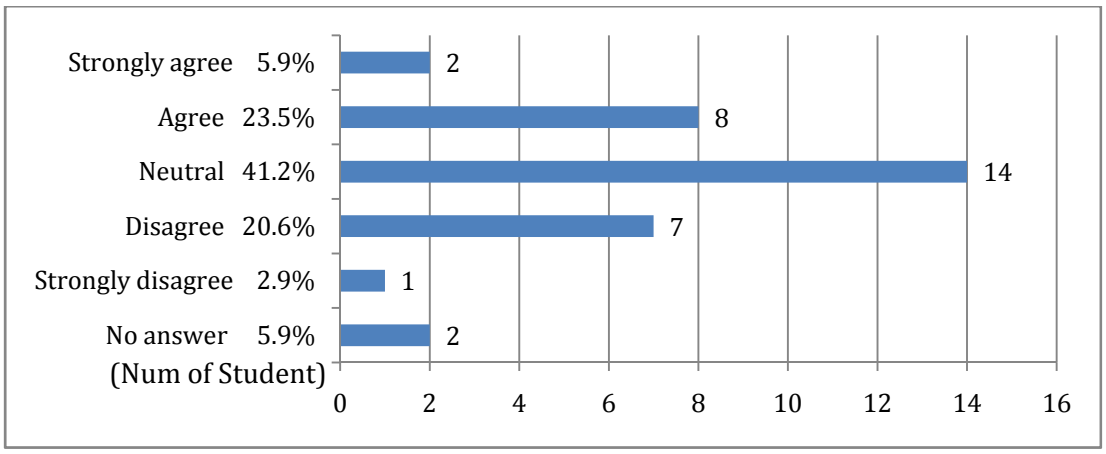
30. Downloading and streaming are appropriate to learning Video lectures.



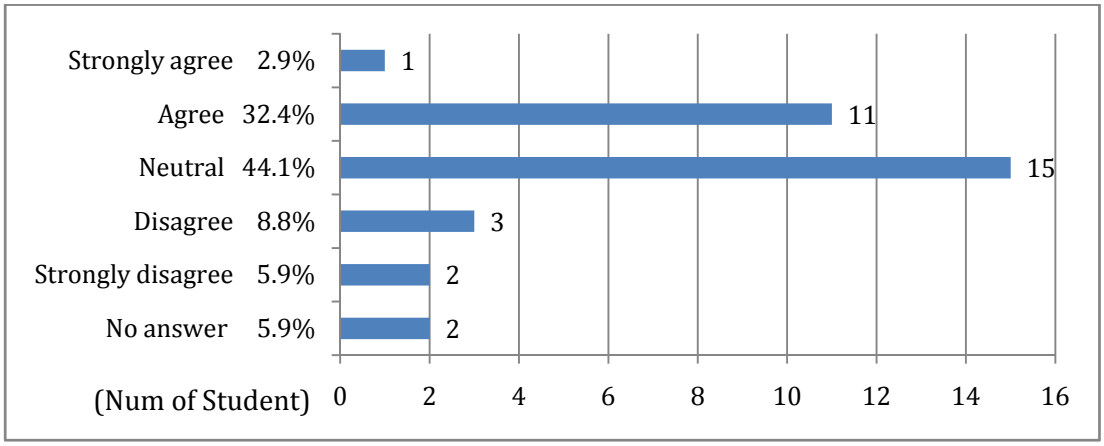
31. Hardware infrastructure such as computers and the Internet connection are appropriate for e-learning.



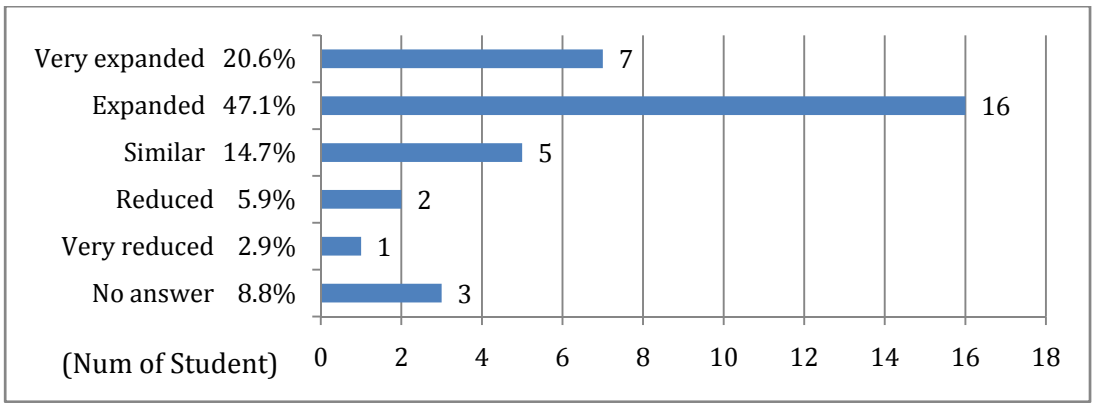
32. Satisfaction in Support by co-instructor and teaching assistant.



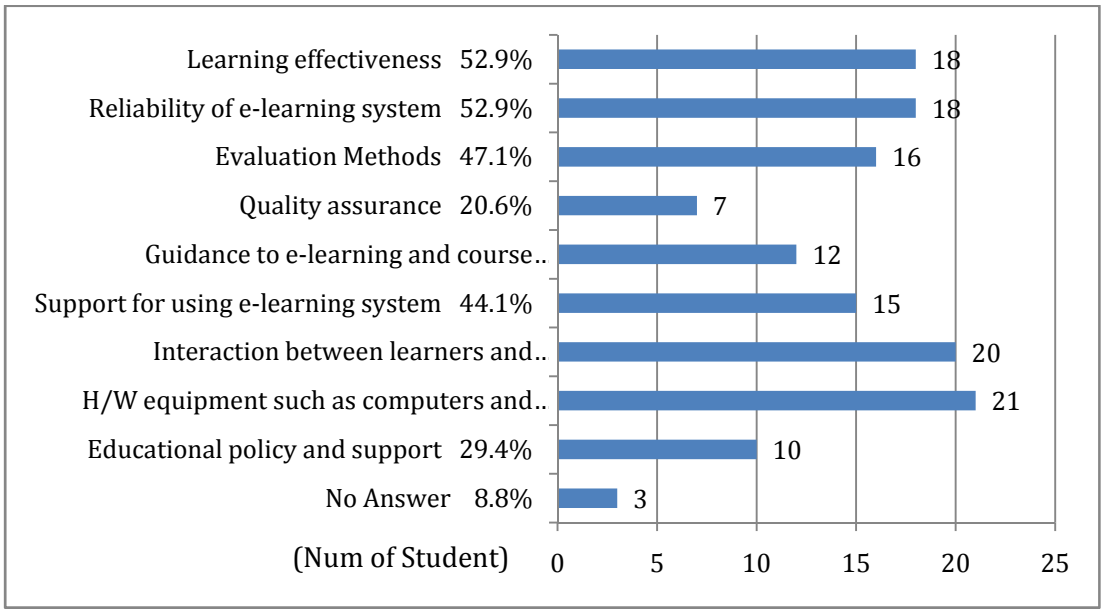
33. Satisfaction in support from the university and the project members.



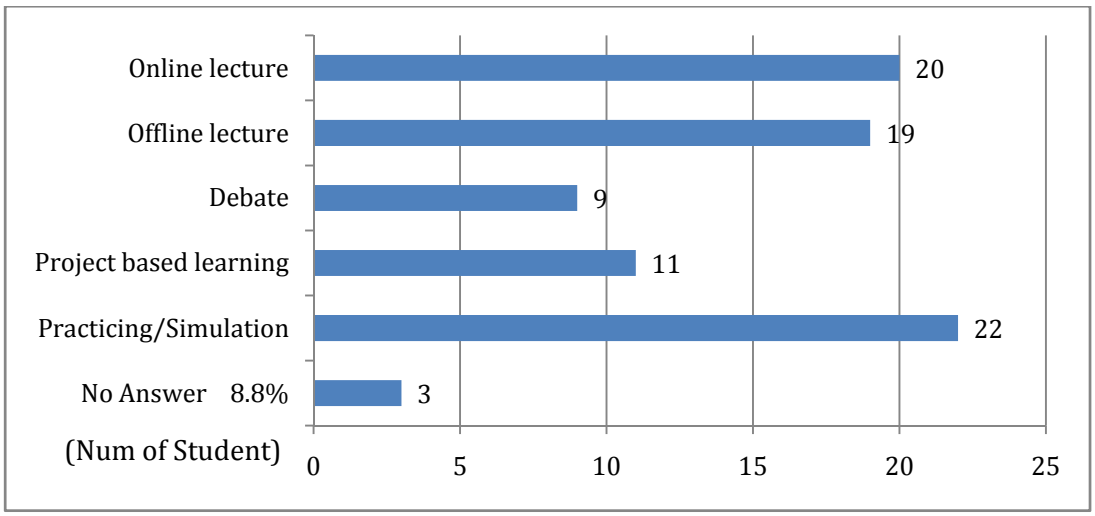
34. Do you think e-learning is going to be expanded for the future?



35. What kinds of difficulties should be improved to expand e-learning?



36. What kinds of learning activities should be reinforced to improve learning effectiveness?



End.

Attachment 7

Preference Research and Reference for ACU Course List

Contents: Major Course – College of Business

Description

1) Referring to Korean National 4-year University curriclums, this list is to figure out CLMV colleges' preference.
2) Year: The proper year of school Korean students generally take the each subject.
3) Willingness for Course Opening: Mark in if you are willing to open the course.
4) Co-instructor Existence: Mark in if your local instructor join the course lecturing.
5) Level: Mark in one of F/I/A as you think appropriate. (F: Fundamental I: Intermediate A: Advanced)
6) Preference Rank: Pick **maximum** of 10coursesforeachcollegeandrankthem1to10.

NO	Course Title	Year	Willingness for Course Opening	Co-instructor Existence	Level			Preference Rank (1to10)
					F	I	A	
College of Business								
General Requirement								
1	Principles of Management	1						
2	Fundamentals of Economics	1						
3	Management and Organization	2						
4	Marketing	2						
5	Business Statistics	2						
6	Principles of Financial Accounting	2						
7	Principles of Cost & Management Accounting	2						
8	Management and New Technologies	2						
9	Management Science	2						
10	Computer Based Information Processing	2						
11	Cost & Management Accounting	2						
12	Intermediate Financial Accounting 1	2						
13	Introduction to Database	2						
14	Management Information System	2						
Management								
15	Financial Management	2						
16	Human Resource Management	3						
17	Investments	3						
18	Advertising	3						
19	Marketing Research	3						
20	Business Operations Management	3						
21	Organizational Behavior	3						
22	Strategic Management	3						
23	Financial Derivatives	3						
24	Logistics Management	3						
25	E-Business	3						

26	Global Management	3						
27	Introduction to Service Marketing	3						
28	Operational Management	3						
29	Marketing Management	3						
30	Venture Business	4						
31	Securities Markets	4						
32	Information System Analysis	4						
33	Management of Financial Institutions	4						
34	Technology Management	4						
35	Consumer Behavior	4						
36	Quality Management	4						
37	Business Ethics	4						
38	Business Consulting	4						
Accounting								
39	Managerial Accounting	3						
40	Business Operations Management	3						
41	Management Information Systems	3						
42	Advanced Management Accounting	3						
43	Tax Accounting 1	3						
44	Consolidated Financial Statements	3						
45	Creativity Management	3						
46	Advanced Financial Accounting	3						
47	Strategic Management	3						
48	Investments	3						
49	Auditing	3						
50	Cost Accounting Exercises	3						
51	Tax Accounting 2	3						
52	Financial Accounting Exercises	3						
53	Global Management	3						
54	Financial Statements Analysis	4						
55	Auditing Practices	4						
56	Tax Accounting Exercises	4						
57	Governments and Nonprofit Accounting	4						
58	Business Consulting	4						
59	Business Ethics	4						
60	Accounting Information Systems	4						
61	Seminar in Accounting	4						
62	US Business Law	4						
63	US Taxation	4						
Economics and Trade								
64	Macroeconomics	2						
65	International Economics	2						
66	Microeconomics	3						
67	International Business Management	3						

Contents: Major Course - College of Language

Description

1) Referring to Korean National 4-year University curriculums, this list is to figure out CLMV colleges' preference.

2) Year: The proper year of school Korean students generally take the each subject.

3) Willingness for Course Opening: Mark in if you are willing to open the course.

4) Co-instructor Existence: Mark in if your local instructor join the course lecturing.

5) Level: Mark in one of F/I/A as you think appropriate. (F: Fundamental I: Intermediate A: Advanced)

6) Preference Rank: Pick **maximum**of10coursesforeachcollegeandrankthem1to10.

NO	Course Title	Year	Willingness for Course Opening	Co-instructor Existence	Level			Preference Rank (1to10)
					F	I	A	
College of Foreign Language								
English Language and Literature								
1	Introduction to American Literature 1	1						
2	Introduction to American Literature 2	1						
3	Introduction to English Language	1						
4	Persuasive Speech	2						
5	English Grammar 1	2						
6	British and American Short Story	2						
7	Modern British and American Drama	2						
8	Introduction to British Literature 1	2						
9	English Phonetics	2						
10	Advanced English Readings	2						
11	English Grammar 2	2						
12	English Poetry in the Renaissance	2						
13	19th Century British Novel	2						
14	Introduction to British Literature 2	2						
15	19th Century American Novel	2						
16	Practical English	2						
17	19th Century English Poetry	2						
18	Critical Theory	3						
19	English Readings for English Majors	3						
20	Readings in English Prose	3						
21	English Syntax	3						
22	Communication in English 1	3						
23	English Morphology	3						
24	English Phonology	3						
25	English Composition 1	3						
26	20th Century American Novel	3						
27	20th Century British Drama	3						
28	English Semantics	3						
29	Communication in English 2	3						
30	History of the English Language	3						
31	English Composition 2	3						
32	Theory of British and American Poetry	3						
33	Modern English Poetry	3						
34	British and American Women Writers	3						
35	20th Century British Novel	3						

36	Shakespeare	3						
37	20th Century American Drama	3						
Korean Language and Literature								
1	Outline of Korean Linguistics	1						
2	Readings in Korean Classic Literature Text	1						
3	Introduction to Contemporary Korean in A Globalized World	2						
4	A study of Old Literature of Korean	2						
5	Practical Korean Expression	2						
6	Korean Grammar	2						
7	History of Korean Language	2						
8	Theory of Literary Composition	2						
9	History of Old Korean Literature	2						
10	Outline of Korean Classic Literature	2						
11	Study of Korean Classic Poetry	2						
12	Theory of Modern Novels	2						
13	Modern Korean Drama	2						
14	Korean Phonology	3						
15	Korean Semantics	3						
16	Korean Dialectology	3						
17	Comparative Literature	3						
18	Hunminjeongeum and Middle Korean	3						
19	Korean Oral Literature	3						
20	History of Modern Korean Literature	3						
21	History of Korean Classic Poetry	3						
22	History of Korean Classic Novels	3						
23	Theory of Modern Poetry	3						
24	Information Processing of Korean Language and Literature	4						
25	Korean Morphology	4						
26	Theory of Korean Language Education	4						
27	Korean Literary Thoughts	4						
28	Theory of Modern Criticism	4						
29	Study of Korean Classic Novel	4						
30	Visual Literature	4						

Contents: Major Course - College of Engineering

Description

1) Referring to Korean National 4-year University curriculums, this list is to figure out CLMV colleges' preference.

2) Year: The proper year of school Korean students generally take the each subject.

3) Willingness for Course Opening: Mark in if you are willing to open the course.

4) Co-instructor Existence: Mark in if your local instructor join the course lecturing.

5) Level: Mark in one of F/I/A as you think appropriate. (F: Fundamental I: Intermediate A: Advanced)

6) Preference Rank: Pick **maximum**of10coursesforeachcollegeandrankthem1to10.

NO	Course Title	Year	Willingness for Course Opening	Co-instructor Existence	Level			Preference Rank (1to10)
					F	I	A	

College of Engineering								
Industrial Engineering								
1	Scientific Management	2						
2	Introduction to Computing for industrial Engineering	2						
3	Engineering Economy	3						
4	Operations Research 2	3						
5	Statistics for Industrial Engineering	3						
6	Linear Programming	4						
Chemical and Biology Engineering								
7	Fundamental of Chemical and Biological Engineering	1						
8	Physical Chemistry 1	2						
9	Engineering Biology	2						
10	Organic Chemistry 1	2						
11	Chemical Reaction Engineering 1	3						
12	Process Fluid Mechanics	3						
13	Chemical and Biological Synthesis Lab.	3						
14	Chemical and Biological Process Lab.	3						
Energy Resources Engineering								
15	Mechanics in Energy Resources Engineering	2						
16	Applied Resources Geology	2						
17	Rock Mechanics	3						
18	Petroleum and Gas Engineering and Experiment	3						
19	Field excursions in resources engineering	3						
20	Leaderships on Energy and Resources Industry	4						
Mechanical and Aerospace Engineering								
21	Mechanical Drawing	1						
22	Solid Mechanics	2						
23	Thermodynamics	2						
24	Mechanical and Aerospace Engineering Lab. 1	3						
25	Mechanical and Aerospace Engineering Lab. 2	3						
26	Design, Manufacturing Process and Laboratory	3						
Materials Science and Engineering								
27	Principles of Materials Engineering 2	1						
28	Physical Chemistry of Materials	2						
29	Thermodynamics of Materials	3						
30	Experiments in Materials 1	3						
31	Experiments in Materials 2	3						
32	Mechanical Behavior of Materials	3						
33	Capstone Design for Material Science and Engineering	4						
Electrical and Computer Engineering								
34	Introduction to Circuit Theory and Laboratory	2						
35	Introduction Seminar of Electrical and Electronic Engineering	2						

36	Introduction to Electronic Circuits and Laboratory	3						
37	Seminar in Electrical and Electronics Engineering	4						
38	Design Project for Electrical Devices & Systems	4						
Computer Science (Information Technology)								
39	Discrete Mathematics	2						
40	Computer Programming	2						
41	Logic Design	2						
42	Logic Design Lab.	2						
43	Data Structures	2						
44	Operating Systems	3						
45	Computer Architecture	3						
46	Programming Language	3						
47	Algorithms	3						

Contents: Major Course - College of Agriculture and Life Science

Description

1) Referring to Korean National 4-year University curriculums, this list is to figure out CLMV colleges' preference.
2) Year: The proper year of school Korean students generally take the each subject.
3) Willingness for Course Opening: Mark in if you are willing to open the course.
4) Co-instructor Existence: Mark in if your local instructor join the course lecturing.
5) Level: Mark in one of F/I/A as you think appropriate. (F: Fundamental I: Intermediate A: Advanced)
6) Preference Rank: Pick **maximum**of10coursesforeachcollegeandrankthem1to10.

NO	Course Title	Year	Willingness for Course Opening	Co-instructor Existence	Level			Preference Rank (1to10)
					F	I	A	
College of Agriculture and Life Sciences								
General Requirement								
1	Agricultural Information System	3						
Bio systems & Biomaterials Science and Engineering, Bio systems Engineering								
2	Material Engineering for Biological Application	2						
3	Applied Mathematics 1	2						
4	Transport Phenomena in Bioproducts	3						
5	Engineering Properties of Bioproducts and Lab.	4						
Plant Science, Crop Science and Biotechnology								
6	Crop Genetics	2						

7	Principles of Crop Production	2						
8	Industrial and Forage Crop Science	3						
9	Experiment and Practice in Crop Science 1	3						
10	Seminar in Crop Science and Biotechnology	4						
Agricultural Economics & Rural Development, Agricultural Economics								
11	Microeconomics	2						
12	Agricultural Economics	2						
13	Quantitative Analysis in Agricultural Economics	3						
Agricultural Economics and Rural Development, Regional Information Major								
14	Fundamentals of Spatial Economics	3						
15	Research in Regional Information	4						
Animal and Food Biotechnology, Food Biotechnology Major								
16	Applied Mathematics 1	2						
17	Physical Chemistry 1	3						
18	Food Chemistry	3						
19	Food Microbiology	3						
20	Food Engineering	3						
21	Food Biotechnology and Bioengineering	4						
22	Food Processing and Preservation 1	4						
Applied Biology and Chemistry, Applied Biology Major								
23	General Microbiology	2						
24	Clinical Plant Pathology & Lab.	3						
25	Insect Diagnostics and Lab.	3						
26	Applied Biology Lab.1	4						
27	Applied Biology Lab.2	4						
Applied Biology and Chemistry, Applied Life Chemistry Major								
28	Biochemistry 2	3						
29	Pesticides	3						
30	Microbial Biochemistry	3						
31	Applied Life Chemistry Lab.1	4						
32	Applied Life Chemistry Lab. 2	4						
Bio systems& Biomaterials Science and Engineering, Biomaterials Engineering Major								
33	Introduction to Biomaterials Engineering	2						
34	Polymer Chemistry 1	3						
35	Biopolymers 1	3						
36	Physical Properties of Polymeric Materials	3						
37	Seminar in Biomaterials Engineering	4						
Food and Animal Biotechnology, Animal Biotechnology Major								
38	Animal Cell Biotechnology and Lab.	3						
39	Animal Nutrition and Lab.	3						
40	Practice in Animal Industry	4						
41	Animal Food Science and Lab.	4						
Forest Science, Environmental Materials Science Major								
42	Bio-Composite Materials and Lab.	3						
43	Papermaking Processes	3						
44	Timber Engineering and Lab.	4						
Landscape Architecture and Rural System Engineering, Landscape Architecture Major								
45	Landscape Tree Management and Practice	2						
46	Computer Graphics for Landscape Architecture	2						
47	Space Design	2						

48	Landscape Surveying and GIS	2						
49	Landscape Architectural Planning Studio	3						
50	Landscape Aesthetics	3						
Landscape Architecture and Rural Systems Engineering, Rural Systems Engineering Major								
51	Surveying and Practice	2						
52	Applied Engineering Mathematics 1	2						
53	Statics	2						
54	Computer Drawing for Rural Design	2						
55	Hydraulics and Lab	3						
56	Applied Structural Analysis	3						
57	Soil Mechanics and Lab.	3						
58	Rural Resources Conservation Engineering & Practice	4						
59	Bio-Environment Control Engineering and Lab.	4						
60	Rural Systems Engineering	4						
61	Rural Water Resources Management Engineering and Practices	4						
Plant Science, Horticultural Science Major								
62	Floriculture and Lab.	2						
63	Plant Growth and Development	2						
64	Vegetable Science and Lab.	3						
65	Horticultural Crop Breeding and Lab.	3						
66	Seminar in Horticultural Science	4						
Forest Science, Forest Environmental Science Major								
67	Forest Resources Management and Practice	4						
Global Environmental Management Major								
68	Environmental Management	3						
69	Environmental Management Practicum(internship)	4						
Vocational Education and Work Force Development, Dept. of Plant Science								
70	Life, Career and Vocation	2						
71	Teaching and Learning Methods in Vocational Education and Workforce Development	3						

Contents: Qualification Program

Description

1) Qualification Programs are to enhance capability to work as a specialist in each area.
2) Courses in each area are mandatory to finish this program.
3) Willingness for Course Opening: Mark in if you are willing to open the course.
4) Co-instructor Existence: Mark in if your local instructor join the course lecturing.

Level: Mark in one of F/I/A as you think appropriate. (F: Fundamental I: Intermediate A: Advanced)

NO	Course Title	Willingness for Course Opening	Co-instructor Existence	Level		
				F	I	A
Qualification Program						

General Requirement						
1	Understanding of e-Learning					
2	e-Learning Production Process and Task					
e-Learning Instructional Designer						
3	Outline for Instructional Designing					
4	Instructional Designing Model I					
5	Instructional Designing Model II					
6	Theory of Teaching I					
7	Theory of Teaching II					
8	Case Study of ID Process I					
9	Case Study of ID Process II					
10	e-Learning Script					
11	Storyboarding I					
12	Storyboarding II					
13	Case Study of e-Learning Production					
14	Project Management					
15	SCORM I					
16	SCORM II					
17	Practice in Storyboarding					
18	Criteria Model of Assessment Test					
19	Criteria Instrument of Assessment Test					
20	e-Learning Contents Evaluation I					
21	e-Learning Contents Evaluation II					
e-Learning Web Producer						
1	Captivate 5.5: e-Learning Production and Device					
2	External File and Animation					
3	Application of Interacting Component					
4	Making up Quiz Materials					
5	Assessment Test					
6	Publishing Project					
7	Outline of Flash Professional CS 5.5					
8	Layer, Timeline, Library					
9	Frame Animation					
10	Motion Tween					
11	Button Symbol					
12	Action Script					
13	Dreamweaver CS 5.5					
14	Fundamental of Screen Component					
15	Advanced Screen Component					
16	Templates					
17	IMS Common Cartridge					
18	Practice in Photoshop and Flash					
19	Practice in Dreamweaver and Captivate					
e-Learning Studio Engineer						
1	Studio-making Mechanism					
2	Pre-production					
3	Understanding of Video Camera					
4	Recording and Lights					
5	Fundamental of Video Switching					
6	Video Switcher Operation					
7	Application of DSK & Virtual Studio					
8	Recording and Encoding					
9	Studio Programming I					
10	Studio Programming II					

11	Adobe Premier Pro CS 5.5					
12	Video Clipping and Management					
13	Video Editing I					
14	Video Editing II					
15	Edited Output					
16	Practice in Recording					
17	Practice in Premier					
18	Advanced Editing Skills					
19	Advanced Editing Skills II					

Contents: Short Program

Description

1) Short Programs are to offer knowledge and practical experience in each subject.
2) Willingness for Course Opening: Mark in if you are willing to open the course.
3) Co-instructor Existence: Mark in if your local instructor join the course lecturing.
4) Level: Mark in one of F/I/A as you think appropriate. (F: Fundamental I: Intermediate A: Advanced)

NO	Course Title	Willingness for Course Opening	Co-instructor Existence	Level		
				F	I	A
Short Program						
ICT Essentials for Government Leaders						
1	The Linkage between ICT Applications And Meaningful Development					
2	ICT for Development (ICTD) Policy, Process and Governance					
3	e-Government Applications					
4	ICT Trends for Government Leaders					
5	Internet Governance					
6	Network and Information Security and Privacy					
7	ICT Project Management in Theory and Practice					
8	Options for Funding ICT for Development					
9	ICT for Disaster Risk Management					
10	Instructional Design					
Primer Series on ICTD for Youth						
11	An Introduction to ICT for Development					
Knowledge Sharing Series						
12	Cyber Security					
13	Institution Building for ICTD Policy					