DEVELOPING OF INDICATORS OF AN E-LEARNING BENCHMARKING MODEL FOR HIGHER EDUCATION INSTITUTIONS

Jirasak Sae-Khow
Faculty of Education, Suratthani Rajabhat University
272 Moo 9 Surat-Nasan Road, Khuntaleay Muang Suratthani
Suratthani 84100, Thailand
E-mail: jirasak_cu@hotmail.com, jeejee99@gmail.com

ABSTRACT
This study was the development of e-learning indicators used as an e-learning benchmarking model for higher education institutes. Specifically, it aimed to: 1) synthesize the e-learning indicators; 2) examine content validity by specialists; and 3) explore appropriateness of the e-learning indicators. Review of related literature included textbooks and research paper and its content was synthesized until 7 indicators were obtained: institute/organization, curricular program/teaching and instructional design, resource/technology/information technology, teaching/learning, learner, faculty and supporting personnel, and measurement/evaluation. Then, the obtained indicators were assessed by specialists based on content validity and appropriateness for further competency comparing.
Keywords: e-learning indicator, benchmarking, e-learning, e-learning benchmarking model

INTRODUCTION

There is continual expansion of e-learning operation and development in many higher education institutes. All of these institutes have been accelerating on the e-learning operation to cope with competition and rapid changes. This is influenced by the report on university ranking of various organizations. In fact, on-line educational institute ranking and quality e-learning assurance are a driving force for higher education institutes to compete one another both at an international and local level. It can be said that the advantage on institutional reputation, research achievement, motivation of students, service users, concerned personnel, public recognition, competency comparison are ways for the development of quality in operation of an organization (Robare, 2000). This can lead to changes of innovation and advantage in competition. Competency comparison is one method employed for self-assessment of general educational institutes for development in order to cope with satisfaction, expectation, and needs of the public (Jackson and Lund, 2006: p.5).

The comparison of e-learning competency is a continual and systematic development process and quality examining on e-learning operation of an organization. It aims to find an operational method and an operational guideline from famous organizations recognized by others. This can be done through learning form excellent practice methods by the standard determination of indicators (benchmark). Then, it is compared with the last indicators and obtained results are improved on quality of e-learning operation based on process, product, and service. This method is employed in the European Union, Australia, U.S.A., and New Zealand. The researcher investigates concepts, competency comparison, e-learning operational process, quality e-learning assurance, and an e-learning benchmarking models abroad, i.e. ACODE (Australia), BENVIC CHIRON MASSIVE and E-xcellence (The European Union), eMM (New Zealand), etc.

The comparison of e-learning competency can be understood as an exploration of operational outcomes of a successful e-learning agency of e-learning leaders. An important thing for the investigation of the operational method by comparing an institute or our agency with others is the construction of e-learning indicators (benchmark). This aims to obtain all standard criteria related to the e-learning operation in which it consists of two main parts: 1) comparison (benchmark) based on a specific aspect and 2) learning exchange on best practices of those who perform better than us. It is a process arisen after the comparison aiming at the improvement of our agency or organization. Indeed, it is the development of indicator (benchmark) which will serve as empirical basis for the standard of e-learning competency comparison for higher education institutes (Office of Strategies Management, 2003).

The obtained e-learning benchmarking model in this study can be used for developing and improving e-learning operation in higher education institutes. Besides, higher education institutes can indicate its strengths and weaknesses on strategic planning for operation, quality assurance, scope of success, convenience facilitation in organization, increased efficiency in managerial administration as well as service improvement (Smith, 2011; Choy, 2007).

LITERATURE REVIEW

E-learning Indicators   Based on a synthesis of e-learning indicators, it was found that there are 7 indicators of e-learning as follows:

1. Institute and Organization   This refers to an institute or organization having e-learning operation with clear e-learning management in terms of: operational policy and strategy; clear e-learning management; continual e-learning strategy management and development; good organization culture supporting its task operation; and, importantly, continual quality improvement and development (WCET, 2001; IHEP, 2000; ACODE, 2007; CHEA, 2002; Thapanee, 2009; Lockhart & Lacy, 2002; Khan, 2001; Haroff & Valentine, 2006; EADTU, 2001).   In addition, the institute and organization have organizational management which includes clear role/function facilitation as well as responsibilities of personnel in various sections which all of these are included in the operational manual.   Also, there is the integration of collaboration among various agencies in the organization (Bates, 2000; Lockhart & Lacy, 2002; Khan, 2001; Haroff & Valentine, 2006; Bacsich Paul, 2006; Deepwell, 2007).   Importantly, the organization must have a management system to assist decision-making of administrators.   Besides, they must possess leadership with the concentration in e-learning management of their organization.   Lastly, it must have a law supporting the e-learning management (CHIRON, 2006; Frydenberg, 2002; The United Kingdom's education. 2003).

2. Curricular Program and Instructional Design   Importantly, curricular programs and instructional design must always be improved, focusing on up-to-date learning content and consistency with learning objectives. Besides, teachers and learners should take part in curricular program improvement/development which must meet needs of learners.   It must have clear curricular structures, goals of the curricular program, and course outline covering all learning content which is consistent with outcomes of educational facilitation (IHEP, 2000; Frydentberg, 2002; Lockhart & Lacy, 2002; CHEA, 2002; Osika, 2004; CHIRON, 2006; CHEA, 2011; Sloan C, 2009; The United Kingdom's education. 2003).   Aside from curricular program, the indicators also concern with teaching/learning design.   Hence, to design a child-centered teaching/learning program based on individual differences and co-task working, concepts and theories related to learning of a learner and flexibility must be taken into consideration (Bates, 2000; Lee & Dziuban, 2002; Khan, 2001).

3. Resources, Technology, and Information Technology   This indicator is essential since it concerns with learning resources, basic technological structures, and provision of information technology services.   Thus, an e-learning institute needs to have enough modern basic structures which cover services (Bates, 2000; CHEA, 2001; Moore & Kearsley, 2005; Bacsich Paul, 2005; Thapanee, 2009).   In addition, it must have a resources center supporting effective teaching/ learning facilitation.   Learners can access services rapidly, conveniently, and with flexibility, (Bates, 2000; Osika, 2004; Moore & Kearsley, 2005; Khan, 2001; European Association of Distance Teaching Universities, 2001; Bacsich Paul, 2006; Thapanee, 2009).   This includes data reservation and good security (Lockhart & Lacy, 2002; Bacsich Paul, 2005 Deepwell, 2007).

4. Teaching/Learning Process   This process occurs when a learner is learning through e-learning.   In fact, it should have agreements and suggestions about teaching/learning methods before learning through e-learning (WCET, 2001; IHEP, 2000; Bates, 2000).   Besides, it should have diverse learning sources (Sloan C, 2009b; Johnstone, 2005; The United Kingdom's education, 2003) in order that a learner has an alternative of learning sources.   Not only this, teacher and learner should always have interaction to each other with rapid responses. The teaching/learning process should place the importance on individual differences in learning potential (WCET, 2001; IHEP, 2000; Bates 2000; CHIRON, 2006).   Also, it needs to always have research on e-learning teaching/learning (Haroff & Valentine, 2006; Institute of Learning and Research Technology, 2003).

5. Learner   A learner is essential to e-learning.   It is a question how the institute supports a learner to have the occurrence of learning and be able to finish his course.   The indicators have the following details: Training a learner on various aspects and guidance before learning (Lockhart & Lacy, 2002; ACODE, 2007); support a learner on information technology using for effective communication and learning (WCET, 2001; Frydenberg, 2002; CHEA, 2011; Osika, 2004; Channey et.al., 2009; European Commission DG Education and Culture, 2002; Modeling Advice and Support Services to Integrate the Virtual Component in Higher Education, 2004; Johnstone, 2005; Thapanee, 2009).   Moreover, giving advice, academic/professional assistance, and provision of convenience to learner are important (Lockhart & Lacy, 2002; Moore & Kearsley, 2005).   This also includes motivation and learning concentration of learner (Sloan C, 2009a; Osika, 2004).   All of these can help learner be successful in learning.

6. Faculty (Teachers) and Supporting Personnel   They are indicators promoting effective learning through e-learning.   They often attend training for an increase in knowledge about new technology and effective

operation (Lee & Dziuban, 2002; CHEA, 2011; OBHE, 2006; Bacsich Paul, 2006). Nowadays, the standard on e-learning practice of faculties and supporting personnel (Sloan C, 2009a; Bacsich Paul, 2006) places the importance on the problem of academic knowledge copying and it should have legal measure prevention.

7. Measurement and Evaluation This indicator should have diverse learning achievement tests and learning evaluations in accordance with: 1) the learning standard (WCET, 2001; IHEP, 2000; Lee & Dziuban, 2002; Lockhart & Lacy, 2002; Institute for Learning and Research Technology, 2003; Bacsich Paul, 2006); 2) curriculum evaluation in accordance with the standard of curricular program and operation of the curricular program (Bacsich Paul, 2006; Haroff & Valentine, 2006; Thapanee, 2009); 3) evaluation of faculties and supporting personnel (WCET, 2001; IHEP, 2000; Lee & Dziuban, 2002; Bacsich Paul, 2006); 4) evaluation of communication and provision of technological services (Osika, 2004; CHIRON, 2006; OBHE, 2006); and 5) evaluation and revision for the system improvement (WCET, 2001; IHEP, 2000; Bates, 2000; Institute for Learning and Research Technology, 2003; OBHE, 2006; Bacsich Paul, 2006; Johnstone, 2005 Thapanee, 2009.

MATERIALS AND METHODS
Instrument
In this study, research instruments included: 1) item objective congruence (IOC) value consideration form; 2) questionnaires from experts to explore content validity of e-learning indicators.

Population and Sample Group
There were three IOC experts, 12 content validity experts, and 12 experts considering appropriateness of the e-learning indicators. All of them were university lecturers and doctor's degree holders. Besides, they had 10 years of services and above on teaching, research, and e-learning services.

Data analysis
The statistical tools used in this study were mean and standard deviation.

RESULTS OF THE STUDY
It was found that the IOC value of the questionnaire was equivalent to 0.85. Table 1 shows content validity examined by 12 experts and appropriateness of e-learning indicators (Appendix A)

Table 1. Levels of content validity and appropriateness of e-learning indicators

Indicator	Content validity	Appropriateness	Description	No. of indicators
1. Institution and Organization	0.93	4.63	Very highly appropriate = 12 Highly appropriate = 3	15
2. Curriculum and Instructional Design	0.93	4.68	Very highly appropriate = 14 Highly appropriate = 4	18
3. Resources Technology and Information Technology	0.90	4.70	Very highly appropriate = 12 Highly appropriate = 1	13
4. Learning and Teaching	0.92	4.73	Very highly appropriate = 11	11
5. Learner	0.68	4.79	Very highly appropriate = 7	7
6. Faculties and Supporting personnel	0.80	4.71	Very highly appropriate = 5	5
7. Measurement and Evaluation	0.94	4.88	Very highly appropriate = 8	8

DISCUSSIONS
Based on the development of e-learning indicators used as a measuring standard (benchmark) by exploring concepts, theories related to distance learning, online learning, and quality of online teaching, the relationship and consistency of the 7 e-learning indicators which could support results of the study were as follows:

1. Institute and organization were important in e-learning. It was supported on policy preparation by the administrative section for clear operation. There was a guideline for concrete management and clear task determination of all concerned personnel. The institute or organization received operational budgets and institutional support could help the e-learning operation be successful. Besides, the institute should seriously support and place the importance on e-learning operation continually (Lockhart & Lacy, 2002; IHEP, 2000). This conformed to a study of Shelton Kaye (2010) on a quality scorecard for the administration of online education programs. He found that the indicator on institutional support comprises 4 sub-indicators. Kanokporn, Chanthana, and Rungpak (2010) stated about the success indicators of the e-learning instructional

process for higher education institutes in Thailand that variables on success of the e-learning instructional system consists of institute and management comprising indicators, philosophy, vision, mission, student admission, system of faculty/supporting personnel support, support and development system, learner service, budget, basic structure, and management/design system.

2. Curricular program and instructional design   The improvement of curricular program was clear, modern and based on learners/learning content which was consistent with the standard as set by the supervision agency. Besides, it must conform to an idea of the Institute for Higher Education Policy (IHEP, 2000) which focuses on course development as the determiner of quality online curricular program. The course structure indicated quality of data, e.g. readiness of a curricular program. For instructional design, all aspects of e-learning must be taken into consideration, e.g. screen design and content which must be consistent with the instructional design concept (Khan, 2001). Instructional design/course included convenient technology and assessment (Lockhart & Lacy, 2002). This conformed to a study of Shelton Kaye (2010) based on two indicators: course development and instructional design. It consisted of 12 sub-indicators and the course structure consisted of 12 sub-indicators, too. This conformed to a study of Chanthanarungpak (2010). She made a conclusion of success indicators of e-learning which places the importance on instructional design. It comprises course indicators which are consistent with goals of the institute, learning interaction, care-taking system instructional strategies.

3. Resources, Technology, and Information Technology   Provision of adequate and modern resources as well as readiness of technological basic structures and information technology to faculty and learners helps smooth communication, assistance, information retrieval, and other supports. Therefore, resources, technology, and information technology can be an indicator making e-learning be successful. In other words, technology is essential for the assurance of quality, appropriateness, and reliability. Besides, the Higher Education committee emphasizes on the readiness of basic structures, equipment, and instructional system (Higher Education committee, 2005). This is particularly on the dimension of e-learning technology and basic structure planning of both hardware and software (Khan, 2001). Thus, it conformed to a study of Chanthanarungpak (2010) and Shelton Kaye (2010) which found that indicators on media and technology comprise structure and instructional media system, instructional quality, media production and development, teaching and learning and indicators of technology support.

4. Instructional Process   e-learning is a learning from in a learner must learn by himself. A systematic instructional process helps reduce problems in learning. The following were included in e-learning: suggestions before learning through e-learning; interaction between teacher and learner; construction of online society; and continual development of instructional research for effective instructional process. This conformed to an idea of Bates which focuses on teaching and learning in e-learning (Bates, 2000). In addition, Institute for Higher Education Policy (2000) claimed that teaching and learning activities needs to have responses between teacher and learner during the instructional process and together with on-time reflection. It also conformed to a study of Shelton Kaye (2010) which found that the instructional process comprises 5 sub-indicators.

5. Learner   Learner was important in e-learning. Besides, support, training, assistance, counseling as well as motivation and attempt could help learner complete his education. The learner support was the consideration of data type form which the learner obtained from learning, needs for learning, learning behavior control, and various services. Online program should be a tool corpus which could be accessible by learner, e.g. frequently asked question in order that the learner could find an answer. This was because online learners wanted to be successful in learning (IHEP, 2000). It confirmed to a study of Shelton Kaye (2010) which found that the learner support comprises 17 sub-indicators.

6. Faculty and Supporting Personnel   Both of them were important in e-learning because they needed to be knowledgeable and skillful in e-learning operation. It was essential that they always attend a training for new technology perception. Having an operational standard of faculty and supporting personnel had an effect on effective e-learning operation.   The faculty support which included prepared data sources for e-learning development and training were important (IHEP, 2000; CHEA, 2011; Osika, 2004; Chaney et.al. 2009). This conformed to a study of Shelton Kaye (2010) which found that the faculty support comprises 6 sub-indicators.

7. Measurement and Evaluation   It was an important component of e-learning used for the assessment of e-learning operation and measurement of learning achievement. Results of the assessment were used as empirical basis for the improvement and development of e-learning. This conformed to the concept of evaluation and assessment of e-learning in which there was the assessment of learning achievement, instruction, and learning environment (Khan, 2001; IHEP, 2000). This included a survey on satisfaction with field of study, basic structures, and e-learning environment (The Sloan Consortium, 2009b; Chaney et.al. 2009; Shelton Kaye, 2010).

This also conformed to a study of Shelton Kaye (2010) which found that the evaluation and assessment indicator comprises 11-indicators. Besides, Chanthanarungpak (2010) found that the indicator on successful e-learning in the assessment indicator comprises the curricular program assessment indicator.

CONCLUSIONS
Regarding outcomes of the development of an e-learning benchmark model for higher education institutes based on opinions of the experts, it was found that there were 7 indicators: 1) institute and organization (15 sub-indicators); 2) curricular program an instructional design (18 sub-indicators); 3) resources, technology and information technology (13 sub-indicators); 4) instructional process (11 sub-indicators); 5) learner (7 sub-indicators); 6) faculty and supporting personnel (5 sub-indicators); and 7) measurement and evaluation (8 sub-indicators). The experts perceived that all indicators had a high to highest level of appropriateness. All of the obtained indicators could be used as a criterion (benchmark) in the form of an e-learning benchmark model for higher education institutes.

ACKNOWLEDGEMENTS

REFERENCES
Australasian Council on Open, Distance and E-Learning. 2007. ACODE benchmarks for e-learning in universities and guidelines for use. [Online]. Available from: http://www.acode.edu.au/benchmarks.php (September 26, 2013)

Bacsich Paul. 2006. The relevance of the MIT90s framework to benchmarking e-learning. Matic Media Ltd.

Bates, A. W. 2000. Managing technological change: Strategies for college and university leaders. San Francisco: Jossey-Bass.

Chaney, B. H., Eddy, J. M., Dorman, S. M., Glessner, L. L., Green, B. L., & Lara-Alecio, R. 2009. "A primer on quality indicators of distance education." Society for Public Health Education, 10(2), 222-231.

Chanthanarungpak, K. 2010. Developing Indicators of the Successful e-learning System of the e-learning Instructional System for Higher Education in Thailand. Unpublished dissertation on Educational Technology and Communication, Faculty of Education, Chulalongkorn University.

CHEA Monograph Series 2002 (Vol. 1). Washington DC: Author. Deepwell, F. 2007. "Embedding Quality in e-Learning Implementation through Evaluation." Educational Technology & Society, 10 (2), 34-43.

Choy Sarojni. 2007. "Benefits of e-Learning Benchmarks: Australian Case Studies" The Electronic Journal of e-Learning. Volume 5 Issue 1, pp 11 - 20, [Online] Available from: www.ejel.org Accessed December 12. Council for Higher Education Accreditation. 2011. CHEA Monograph. Series 2002. Number 1. , [Online] Available from: http://www.chea.org/research/accred-distance. Accessed December 12.

Council for Higher Education Accreditation. (2002). Accreditation and assuring quality in distance learning.

Europe's institutional network for open and flexible higher education. 2011. e-learning benchmarking community of Associates in Quality. [Online] Available from: http://www.eadtu.nl/e-xcellencelabel/default.asp?mMid=2 Accessed September 9.

European Association of Distance Teaching Universities. 2011. E-xcellence in E-learning associates in quality. Available from: http://www.eadtu.nl/e-xcellencelabel/default.asp?mMid=1. Access September 12. European Commission DG Education and Culture. 2002. Case study report Benchmarking of virtual campuses. Spain: University at Oberta de Catalunya.

Frydenberg, J. 2002. "Quality standards in e-learning: A matrix of analysis." International Review of Research in Open and Distance Learning, 3(2).

Haroff, P. A., & Valentine, T. 2006. "Dimensions of program quality in web-based adult education." The American Journal of Distance Education, 20(1), 7-22.

Institute for Higher Education Policy. 2000. Quality on the line: Benchmarks for success in Internet-based distance education. Author, Washington, DC. Institute for Learning and Research Technology. 2003. Embedding Learning Technologies Institutionally: A Workshop Pack for Higher and Further Education. University of Bristol.

Institute for Research and Study of Accreditation and Quality Assurance CHEA. 2002. Accreditation and Assuring Quality in Distance Learning. CHEA Monograph Series 2002. Number 1.

Jackson, N. J. & Lund, H. 2000b. "Benchmarking for Higher Education: Taking Stock," Jackson, N. and Lund, H. (Eds). Benchmarking for Higher Education, Open University Press, Buckingham.

Johnstone, S. M. 2005. "Open Educational Resources Serve the World." EDUCAUSE Quarterly. Vol.28. No. 3. pp.15 -18.

Khan, B. 2001. "A framework for web-based learning. In B. Khan (Ed.)." Web-based training (pp. 75-98). Englewood Cliffs, NJ: Educational Technology.

Lee, J., & Dziuban, C. 2002. "Using quality assurance strategies for online programs." Educational Technology Review, 10(2), 69-78.

Leonardo da Vinci Programme. 2006. Collection and Comparison of National and European set of Benchmarks and valuation Model for E-learning Effectiveness: Refereeing Innovative Technologies and Solutions for Ubiquitous Learning. (CHIRON). [Online] Available from: http://semioweb.msh-paris.fr/chiron/ecdocuments.htm. Accessed September 13.

Lockhart, M., & Lacy, K. 2002. As assessment model and methods for evaluating distance education programs. Perspectives, 6(4), 98-104. doi:10.1080/136031002320634998

Modeling Advice and Support Services to Integrate the Virtual Component in Higher Education. 2004. Tools and criteria to identify good practices carry out the seminars and the peer review sessions. [Online] Available from: http://cevug.ugr.es/massive/pdf/Annex_2.pdf. Accessed August 13.

Moore, M. G., & Kearsley, G. 2005. Distance education: A systems view. Belmont, CA: Thomas Wadsworth. The United Kingdom's education. 2003. Citing the Open and Distance Learning Quality Council (ODLQC) standard.

Office of Higher Education Committee, Ministry of Education. 2005. A Practice Guideline in Accordance with the Criteria on the Approval of Higher Education Curricular Programs of the Distance Education System, 2005. [Online] Available from http://www.thaicyberu.go.th/document/guideline2005.pdf

Office of Strategic Management. 2003. A Study on the Development of Quality Assurance of Thai Higher Education institutes Using Benchmarking. A complete report, Chulalongkorn University. [Online] Available from http://www.osm.chula.ac.th/index.php/m-qa-learning/67-learning-qa/142-qa-benchmark-report. Assess September 12.

Osika, E. R. 2004. The Concentric Support Model: A model for the planning and evaluation of distance learning programs. Doctoral dissertation. Retrieved from ProQuest Dissertations and Theses. (UMI No. 3150815)

Robere, P.J. 2000. Benchmarking: A system approach for continual improvement. Bangkok: Durakitbundit University Press.

Shelton Kaye. 2010. A Quality Scorecard for the Administration of Online Education Programs: A Delphi Study. Doctoral Dissertation Faculty of the Graduate College at the University of Nebraska.

Sloan Consortium. 2009a. The Sloan Consortium: A consortium of individuals, institutions and organizations committed to quality online education. [Online] Available from: http://www.sloan-c.org/ Accessed September 13.

Sloan Consortium. 2009b. The Sloan Consortium: The 5 pillars. [Online] Available from: http://www.sloan-c.org/5pillars Accessed May 13.

Smith Alan. 2011. Encouraging benchmarking in e-learning. [Online] Available from : http://www.altc.edu.au/project-encouraging-benchmarking-elearning-usq-2007. Accessed April 13.

Thammametha, T. 2009. "Quality Assurance of e-learning." Education journal. 38, 1(July-October, 2009) pp. 82-89.

The Observatory on Borderless Higher Education. 2005. e-learning Benchmarking - Phase 2 BHE/ACU Final Report.[Online]. Available from: http://www.obhe.ac.uk/what_we_do/resourcess. Accessed March 13.

Western Cooperative for Educational Telecommunications. 2001. Best practices for electronically offered degree and certificate programs. Boulder, CO: Western Interstate Commission for Higher Education (WICHE).

Appendix A: An assessment of the appropriateness of e-learning indicators

E-learning indicator (ITEM)	Mean	SD	Description
1. Institute and Organization			
1.1. The institute has a clear policy and strategy on e-learning	4.92	.28	Very highly appropriate
1.2. Operational planning on e-learning of the institute is clear	4.83	.38	Very highly appropriate
1.3. The structure of organization management related to e-learning of the institute is clear	4.83	.38	Very highly appropriate
1.4. The institute receives e-learning standard certificate	4.58	.66	Very highly appropriate
1.5. The e-learning management system and decision-making of administrators	4.58	.66	Very highly appropriate
1.6. Computation of the effectiveness of operational expenses	4.58	.66	Very highly appropriate
1.7. Good organizational culture supporting the organizational operation	4.00	1.20	Highly appropriate
1.8. The policy on right reserve law related to e-learning	4.66	.49	Very highly appropriate
1.9. Leadership and attempt of e-learning administrators	4.41	.79	Highly appropriate
1.10. Clear roles, duties, and responsibilities of organization personnel	4.92	.28	Very highly appropriate
1.11. Continual institution support on e-learning	4.75	.45	Very highly appropriate
1.12. Continual improvement of quality of e-learning operation	4.58	.51	Very highly appropriate
1.13. Continual strategy management and development	4.58	.51	Very highly appropriate
1.14. Integration of coordination within the institute	4.66	.49	Very highly appropriate
1.15. Process design and networks for business outcomes	4.16	.93	Highly appropriate
2. Curricular Program and instructional design			
2.1. Continual curricular program development	4.75	.62	Very highly appropriate
2.2. Clear curricular program structures	4.75	.62	Very highly appropriate
2.3. Curricular program has goals and objectives	4.75	.62	Very highly appropriate
2.4. Content details of curricular program cover competency and were consistent with outcomes	4.75	.62	Very highly appropriate
2.5. Course description	4.92	.28	Very highly appropriate
2.6. Curricular program is appropriate with learners	4.92	.28	Very highly appropriate
2.7. Instructional design meets quality based on process and principles of instructional design	4.66	.88	Very highly appropriate
2.8. There is a standard of curriculum program design	4.66	.65	Very highly appropriate
2.9. Curricular program design is based on learner-centered	4.66	.65	Very highly appropriate
2.10. Instructional design is based on individual differences of learners	4.75	.62	Very highly appropriate
2.11. Instructional design focuses on collective learning (co-working)	4.41	.66	Highly appropriate
2.12. Learning content is developed so as to be up-to-date and consistent with learning objectives	4.92	.28	Very highly appropriate
2.13. Faculty and learners participate in the construction and development of curricular program	4.75	.45	Very highly appropriate
2.14. Curricular program design is consistent with needs of learners	4.75	.62	Very highly appropriate
2.15. Easy assessment to documents of curricular program	4.75	.45	Very highly appropriate
2.16. Screen design is based on concepts and theories related to learning	4.33	.88	Highly appropriate
2.17. Curricular program is flexible	4.41	.79	Highly appropriate
2.18. Curricular program provides new experiences for learners	4.33	.77	Highly appropriate
3. Resources, Technology, and Information Technology			

E-learning indicator (ITEM)	Mean	SD	Description
3.1. Basic structures of information technology are modern, adequate, and it cover all services	5.00	.00	Very highly appropriate
3.2. Supporting resource center on instructional management is effective	5.00	.00	Very highly appropriate
3.3. Continual planning on technological development for teaching and learning	4.83	.38	Very highly appropriate
3.4. Planning on technology development and security system	4.83	.38	Very highly appropriate
3.5. Having data reservation	4.92	.28	Very highly appropriate
3.6. Data reliability and technology	4.50	1.00	Very highly appropriate
3.7. Having the center of construction , support, and maintenance	4.50	1.16	Very highly appropriate
3.8. Technological support for faculty, supporting personnel, and learners	4.58	.90	Very highly appropriate
3.9. Service using and flexibility	4.33	1.23	Highly appropriate
3.10. Application of information technology for teaching and learning	4.75	.62	Very highly appropriate
3.11. Convenient and rapid assessment of learning resources all the time	4.75	.62	Very highly appropriate
3.12. Potential in techniques and services	4.66	.65	Very highly appropriate
3.13. Learning materials are modern and adequate	4.50	.67	Very highly appropriate
4. Instructional Process			
4.1. Learning agreements and suggestions	4.92	.28	Very highly appropriate
4.2. Diverse learning sources	4.75	.45	Very highly appropriate
4.3. Appropriate and clear communication in instruction	4.75	.45	Very highly appropriate
4.4. Rapid response of faculty when learners have any problem	4.75	.45	Very highly appropriate
4.5. Effective interaction between faculty and learner and without limitations	4.75	.45	Very highly appropriate
4.6. Continual development of research on teaching and learning	4.75	.62	Very highly appropriate
4.7. Reputation of faculty is a strategy used for creating reliability	4.50	.67	Very highly appropriate
4.8. Socialization and participation of learners	4.83	.38	Very highly appropriate
4.9. Online community supports instructional activities	4.75	.45	Very highly appropriate
4.10. Continual development of instructional forms for effective learning	4.50	.79	Very highly appropriate
4.11. Instructional activities focus on individual difference based on learning performance	4.83	.38	Very highly appropriate
5. Learner			
5.1. Training on various aspects and guidance before learning through e-learning	4.92	.28	Very highly appropriate
5.2. Support learners on information technology using for communication and learning	4.92	.28	Very highly appropriate
5.3. Giving advices and academic/professional assisting as well as convenience providing for learners	4.92	.28	Very highly appropriate
5.4. Having appropriate documents used for learning	4.92	.28	Very highly appropriate
5.5. Learners have motivation and attempt to learn	4.58	.90	Very highly appropriate
5.6. Having support on data service for learners	4.58	1.16	Very highly appropriate
5.7. Learner participation with school and study program	4.66	.65	Very highly appropriate
6. Faculty and Supporting Personnel			
6.1. Training for development and perception of new technology	4.92	.28	Very highly appropriate
6.2. Faculty support on teaching equipment resources, and convenience facilities	4.58	1.16	Very highly appropriate
6.3. Assistance on techniques of faculty	4.58	1.16	Very highly appropriate

E-learning indicator (ITEM)	Mean	SD	Description
6.4. Placing the importance on the problem of academic copying and the legal measure to prevent the academic copying	4.66	.65	Very highly appropriate
6.5. Having operational standards and clear tasks of faculty and e-learning supporting personnel	4.83	.38	Very highly appropriate
7. Measurement and Evaluation			
7.1. Learning achievement and outcomes of diverse learners	4.92	.28	Very highly appropriate
7.2. Efficiency measuring on standard learning facilitation	4.92	.28	Very highly appropriate
7.3. Assessment of curricular program in accordance with the curricular program standards	4.92	.28	Very highly appropriate
7.4. Assessment of faculty and supporting personnel	4.92	.25	Very highly appropriate
7.5. Assessment of the curricular program operation	4.83	.38	Very highly appropriate
7.6. Collection of learners' opinions	4.92	.28	Very highly appropriate
7.7. Measuring communication and technological service outcomes	4.66	.65	Very highly appropriate
7.8. Assessment and revision for improving the whole system	4.92	.28	Very highly appropriate