

An Analysis of the Key Indicators of E-learning Curriculum Certification in Different Subject Areas

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Abstract :

In recent years, several colleges and universities by Taiwan's Ministry of Education curriculum e-learning curriculum certification program, which represents a digital implementation of quality assurance and affirmation. Taiwan's Ministry of Education e-learning curriculum requirements for certification indicators also provided to enhance the quality of teachers at the domestic implementation of several teaching important reference. Statistics over the years to apply for certification courses can be found in each case specifications, indicators, different subject areas there may be differences in the circumstances in the case to reach certification standards.

This paper attempts to apply for course certification from recent cases, the analysis of the differences of the different subject areas on each specification, index performance. The results found that subjects in various different areas of specification required for implementation of the project indicators and reached a different degree of difficulty, and then summarize the key indicators certified association. This achievement can let educators in the implementation of e-learning courses and certification courses to achieve quality, providing a reference quite valuable indicators of key norms and execution.

Keywords: *e-learning, certification standards, curriculum indicators*

I. INTRODUCTION

Nowadays, knowledge is updated in a fast pace; therefore, people's learning ways have been changed. Traditional learning methods are no longer satisfactory. Because of the advancement of information technology, new learning ways have appeared, and e-learning is the most popular one. In order to understand the penetration rate of ADSL and PC in Taiwan nowadays, the Institute for Information Industry has conducted a survey about the current application and need of ADSL in families in Taiwan since 2001. It aims at carrying out a research about the status quo of Taiwanese families and people using the internet. In terms of families, in 2013, the penetration rate of internet is 84.8%, and 88.4% of Taiwanese families have one or more computers [1]. As a result, we can know that the penetration rate of internet in Taiwan is quite high. The era of e-technology life has come into shape. Therefore, colleges have

promoted e-courses to meet the needs of learners. Also, in order to go with the trend, school teachers now endeavor to present the curricula in e-learning frameworks by multimedia and internet.

E-learning is the current learning trend, featuring convenience, popularity, and no time and space limitation. It has gradually become an important way of learning in universities and employee trainings, breaking the frame of on-campus learning. E-learning has become the main way of learning, teaching, and training in schools and companies [2].

The Executive Yuan of Taiwan has also passed a “Challenge 2008 Six-Year National Development Plan” in May 8, 2002. It focused on cultivating e-generation talents by e-technology, promoting many sub-plans related to e-learning. “National Science and Technology Program for e-Learning” was also carried out in the same year. E-learning application was promoted through collaboration among different government organizations. A shared learning platform had been established, and related plans and programs had been integrated among different government organizations [3].

Both the academic field and the industry have developed in a quick pace through the advantages of e-learning. Jiang Jia-Yu [4] pointed out that under the rapid development of e-learning, many scholars have started to question if e-learning curricula and teaching quality can meet the satisfactory standard. Some institutes use the title of e-learning to provide programs featuring “graduate within a short period” or “get your degree quickly,” recruiting domestic and oversea students. However, the teaching quality is not carefully controlled. The quality of e-learning students worries many teachers and organizations. Students hesitate when choosing distant courses.

Chen Peng-Tong [5] mentioned that facing the expansion of higher education and the era of low birthrate, joining WTO’s global competition, and proposing the close mechanism by education authorities, our higher education now face survival competition domestically, and other countries recruit students in Asia through distant teaching. This is an international cut-throat competition. Hou Yong-Qi [6] pointed out how a country emphasize, define, and evaluate its higher education institutes reflects its economic level, society culture, and international status in terms of higher education.

Therefore, as the application of e-learning had been ripening, in order to make sure that teaching institutes can provide quality distance learning activities and further protect the rights of learners, the related authorities had established e-learning quality indicators and certification criteria. The “Procedural Rules Governing Distance Learning at the Junior College and Higher Levels” enacted by Taiwan’s Ministry of Education on August 15, 2005 (modified to “Implementation Regulations Regarding Distance Learning by Universities” on September 8, 2006) stated that the total number of distance learning credits shall be limited to half (originally one third) of the credits required for graduation and obtaining an academic degree by a student. Besides, under the certification mechanism, e-learning master programs are provided in certain areas. Also, “E-learning Master Program Trial Application and Examination Directions” was officially passed and brought into practice on March 2, 2006. (Modified to “E-learning Master Program Trial Application Examination and Certification Directions” on April 29, 2009) and “E-learning Certification Application Instructions” (Modified to “Ministry of Education E-learning Master Program Examination and Certification Application Directions” and “Ministry of Education E-learning Curriculum and Course Certification Examination and

Certification Application Directions” on May, 2009). It was the first time to open certain areas for a trial of e-learning master program and e-learning curriculum and teaching material certification at Taiwan.

It has been nine years since the start of e-learning certification in 2006. The development of e-learning application is very rapid, and concrete results are shown in terms of quality assurance. There have been years of accumulation for certification data. If further research analyses could be carried out, they shall serve as evidence for the success of e-learning quality assurance development for recent years.

Li Qing-Fu [7] pointed out in related researches that the topics of e-learning researches are not only diversified but also a cross-area subject. As a result, comparisons between different areas can facilitate understanding if there are differences between the focused e-learning research subjects. This research aims to categorize the subjects for examination according to their areas. The difficulties for achieving the criterion indicators are different for subjects of different areas. Therefore, whether the courses for examination can pass depends on the successful analysis of key indicators. If in the course area, there is a criterion indicator key to passing the certification, then key indicators for passed the certification can be concluded. It will be concrete support and suggestion for universities trying to pass the course certification. It is the main purpose of this research.

II. RELATED SYSTEMS OF E-LEARNING QUALITY ASSURANCE

The industries emphasized on the concept of performance responsibility, and the government had introduced this concept and a series of performance indicators to universities, trying to promote the quality of higher education and its competitiveness. Therefore, the quality assurance mechanism had come into shape [8]. The focus of quality assurance should be whether the teaching contents meet the standards through a systematic and well-organized examination mechanism or procedure [9][10]. Pawlowski [11] pointed out the fact that the quality should be examined through diversified angles. Since the properties of course quality are different, different perspectives should be taken into consideration and strengthened. The development of e-learning is very fast around the world. In many countries, both the government and non-official organizations had set up plans of vision like a national e-learning program or the establishment of quality assurance units. Evaluation and certification mechanisms related to e-learning had also been proposed to ensure the quality of e-learning. Some examples are the CHEA (Council for Higher Education Accreditation) in the United States, Distance Education and Training Council (DETC), USDE (United State Department of Education), Certificate in Adult & Continuing Education (CACE) in Canada, eQcheck, QAA (Quality Assurance Agency for Higher Education) in the United Kingdom, ACOE (The Australasian Council on Open, Distance and e-Learning), eLC in Japan, and KELIA in South Korea.

So far, there are two organizations for e-learning curriculum certification in Taiwan: One is the E-learning Quality Service Center for private or government sectors. The other is E-learning Accreditation and Information Exchange, Ministry of Education for college e-learning courses and e-learning master program certification. The service of E-learning Quality Service Center started in 2005. Its goal is providing the evaluation and examination mechanism for e-learning curriculum, effectively helping e-learning providers meet the standards of e-learning evaluation criteria certification, promoting the quality of e-learning in Taiwan, and elevating the level of our e-learning industry internationally. The current certification items are e-learning services and e-learning curriculum quality. After passing

the certification, An A, AA, or AAA mark will be granted. Due to the stability of e-learning industry production quality, many e-learning products and services had passed the certification and met the quality standards. As a result, since 2014, the E-learning Quality Service Center stops the task of Yearly Certification Award. In 2015, the certification service will also end [12].

In order to promote the quality of e-learning courses and facilitate teachers and students to join the ally of e-learning, the Ministry of Education started the certification of college e-learning curriculum and courses in May, 2006. The content of MOE’s e-learning certification includes eight criteria and 37 indicators. 18 indicators are required; 19 optional. There will be a grading of A+, A, or B for each indicator. In order to pass the certification, all required indicators need to be A or A+. In average, we can see A+ as three points, A as two points, and B as one point. Therefore, A “B” can be buffered by an “A+” and form an “A” [13].

III. The general condition of e-learning certification

The e-learning certification system had been modified for several times since 2006. Roughly it had been modified every two years. In Table I, the curriculum certification indicators in each edition are listed. Some basic differences can be found.

TABLE I. A COMPARISON OF E-LEARNING CURRICULUM CERTIFICATION IN EACH EDITION

YEAR	2006~2008	2009~ 2010-1	2010-2~ 2012	2013~2014
Edition	1	2	3	4
Description	101 indicators (47 required, 54 optional)	40 indicators (22 required, 18 optional)	40 indicators (21 required, 19 optional)	37 indicators (18 required, 19 optional)

In the first edition, the certification indicators are categorized into three dimensions and 101 indicators. After 2009, only eight criteria were retained. The first six criteria had been included in the previous dimension 1. As for dimension 2, it had been condensed into criterion 7, “Teaching management service.” Dimension 3 was also just condensed into criterion 8, “Platform function examination.” There were only 37 indicators. The content became more concise and understandable, and was very different from the edition before 2008. Hence, the samples being analyzed in this research are the courses after 2009, and courses of the e-learning master program are not included. Before 2014, batch 1, there were 10 batches. In Table II, the number of application and passing are shown.

TABLE II. THE APPLICATION AND PASSING NUMBERS OF E-LEARNING CURRICULUM CERTIFICATION IN EACH BATCH

B = Batch A = Application P = Passing
PR = Passing rate E = Edition

B	A	P	PR	E	A	P	PR
2009	21	11	52.4%	2	39	19	48.7%
2010-1	18	8	44.4%				
2010-2	29	18	62.1%	3	143	85	59.4%
2011-1	30	21	70.0%				
2011-2	32	18	56.3%				
2012-1	25	11	44.0%				
2012-2	27	17	63.0%				
2013-1	35	19	54.3%	4	96	45	46.9%
2013-2	34	12	35.3%				
2014-1	27	14	51.9%				
Total	278	149	53.6%				

From 2009 to 2010, batch 1, there had been 39 applications for e-learning curriculum certification. According to the certification indicators, 2nd edition, 19 passed. The passing rate was 48.7%. From 2010, batch 2 to 2012, batch 2, there had been 143 applications for e-learning curriculum certification. According to the certification indicators, 3rd edition, 85 passed. The passing rate was 59.4%. From 2013, batch 1 to 2014, batch 1, there had been 96 applications for e-learning curriculum certification. According to the certification indicators, 4th edition, 45 passed. The passing rate was 59.4%.

IV. ANALYSES OF E-LEARNING CURRICULUM CERTIFICATION

Chia-Nien Liu, Kao-Yung Lin, Chiu-Tien Kuo & Tzu Huang [14] showed in 2013, there had been 79 applications, and 34 passed (The passing rate was 43.0%). For these e-learning curricula applicable for the new indicators in 2013, for the 45 courses which didn't pass the certification, analyses were made to find out the key failing factors, such as there were grading B's in the required indicators, and the flaws in some important optional indicators. The reason for analyzing the failing rate of required indicators was to understand the key points which are easy to miss in the practice and production of general e-learning curricula. Concrete remedial strategies and methods were discussed to better the quality of e-learning. Chia-Nien Liu [15] found out in criterion 4, teacher-student interaction, the number of B's was 50, the highest. Next was criterion 6, learning evaluation (36). Criterion 2, maintaining learning motivation (25) was the third highest. In contrast, criterion 7, teaching management service (2), and criterion 8, platform function examination (1) had least B's, so they were the criteria which were relatively easy to pass the certification.

In 2013 ranking of the e-learning certification required indicators that failed to pass, indicator 4-2, active teacher-student discussions in non-simultaneous teaching, were the highest (57.8%). Next were indicator 5-1, in non-simultaneous teaching, abundant cross-discussions among learners toward course-related issues (53.3%), indicator 6-3, results and feedbacks were provided for the on-line tests or evaluation activities, indicator 2-1, the course and unit teaching goals are covered in the curricula and teaching activities (40.0%), indicator 4-3, the teacher can quickly answer the questions from the learners in the course discussion section (37.8%), indicator 6-2, on-line tests or evaluation

activities are provided in the course web pages (24.4%), indicator 2-2, the teacher provides teaching activities that can examine the learners' achievements in the unit (15.6%), and indicator 4-1, the teacher's introduction and email address are provided on the course webpage (15.6%).

Liu, et al,[14] thought the following are the reason why the curriculum certification failed:

- (1) In criterion 4, teacher-student interaction and criterion 5, peer interaction, the main reason for the failure was the interaction between teachers and students. In terms of teaching interaction, no matter in simultaneous or non-simultaneous teaching, the teacher-student and peer discussions were not enough (or the topic being discussed was not related to the course). The teacher didn't answer the question from the learners in the course discussion board within one week, or the way of feedback was questionable and needed to be improved.
- (2) In criterion 6, learning evaluation, the on-line tests or self-evaluation was insufficient (or inappropriate). When showing the results, explanations were not provided. There were key factors for the failure. Besides, the course curricula and learning activities failed to connect to the teaching goal. The teacher emphasized on lecturing and didn't design appropriate learning activities to examine the learning achievements. These were the reason why learners' motivation dropped. Improvements were needed.

MOOCs (Massive Open Online Courses) has become very popular in recent years. The Ministry of Education has also actively promoted MOOCs programs. The trend of MOOCs courses is useful, proficient, exquisite, and problem-solving oriented to intrigue learning motivation. It emphasizes on diversified evaluation forms, cooperative learning activities, and making good use of social media. It is expected that MOOCs will be a new direction for Taiwan's future e-learning development [15]. In order to let people participate in e-learning and get certification, taking the current law into consideration, if the certification of the achievement of unofficial learning can be combined with e-learning curriculum certification, the certification mechanism will become more subjective and practical [16].

Professor Chen Ding-Bang, Chiu-Tien Kuo, and Kao-Yung Lin, National Open University, pointed out in e-learning curriculum certification key factor analysis (based on the indicators in 2nd edition) that in criterion 1, subject description, criterion 3, interaction between learners and teaching materials, and criterion 7, teaching management service, e-learning curricula stand out. But in criterion 5, peer interaction, criterion 6, learning evaluation, and criterion 8, platform function examination, the performance was unsatisfactory. Although the teachers and students had the basic capability of e-learning, the performance of interaction forms and self-examination needs to be improved, especially the use of learning platform to provide the basic function of distant teaching. Staff is important, but the use of platform function is more important.

In the evaluation of best indicators of e-learning curriculum, 7-1 (required), the teaching institute properly keeps the subject data in the curriculum website, ranked first in the evaluation. Ranked second was 4-8 (optional), appropriate supporting face-to-face teacher-student interaction is provided in the curriculum. Ranked third was 1-3 (required), the grading policy is clearly described. Ranked fourth was 3-6 (optional), friendly download functions are provided in the teaching materials. Ranked fifth was 4-2 (required), appropriate and abundant simultaneous or non-simultaneous teaching activities are performed by the teacher. The distribution of average difference of best indicators are quite wide,

showing that in traditional campus distant teaching is applicable, especially since it gained high evaluation results in the application of planning. It is an important reference. As for the evaluation of worst indicators, ranked first was 4-3 (required), the teacher and students can actively participate in discussions in simultaneous or non- simultaneous teaching. Ranked second was 5-3 (optional), when discussions related to the curriculum are carried out in a simultaneous way, learners can have appropriate interaction. Ranked third was 4-5 (required), both the teacher and students can actively participate in discussions related to the course topic in simultaneous teaching. Ranked fourth was 4-7 (optional), on-line learning counselors are provided. Ranked fifth was 4-4 (required), in non-simultaneous teaching, the teacher can answer questions from students in time on the course discussion board, providing good feedbacks. In criterion four, both the teacher's or students' performance in simultaneous or non-simultaneous interaction in e-learning can be strengthened. Maybe it's the natural barrier of performing e-learning in a traditional campus. The teacher and learners are used to traditional face-to-face interaction. In Table III shows the indicators with a failing rate higher than 10%.

TABLE III. REQUIRED INDICATORS WITH A FAILING RATE HIGHER THAN 10%

INDICATOR NUMBER	DESCRIPTION	FAILING RATE
4-2	Active teacher-student discussions in non-simultaneous teaching	25%
5-1	In non-simultaneous teaching, abundant cross-discussions among learners toward course-related issues	23%
6-3	Results and feedbacks were provided for the on-line tests or evaluation activities	19%
4-3	The teacher can quickly answer the questions from the learners in the course discussion section	18%
2-1	The course and unit teaching goals are covered in the curricula and teaching activities	15%
6-2	On-line tests or evaluation activities are provided in the course web pages	10%

V. ANALYSES OF E-LEARNING CURRICULUM UNDER DIFFERENT FIELDS

In this research, e-learning courses are categorized according to their fields: 1. Computer and information science 2. Finance and management 3. Language learning 4. Literature and arts 5. Education and learning 6. Medicine and health 7. Social science 8. Living science 9. Natural science 10. Living application. The application number, passing number, and passing rate were calculated.

The result was, in the 278 applications, there were 100 in computer and information science, 54 in finance and management, 43 in social science, 24 in education and learning, 23 in natural science, 13 in literature and arts, 8 in language learning, 7 in living application, 3 in living science, and 2 in medicine and health. The top three of passing were: computer and information science (50), finance and management (27), and social science (27).

In the 278 applications, 149 passed. The total passing rate was 53.6%. The fields which have a passing rate higher than average were: medicine and health (100.00%), living application (71.43%), natural science (69.57%), living science (66.67%), and social science (62.79%). Detailed statistics are listed in Table IV.

Among the 10 subject fields, computer and information science had the most applications, 100. Next was finance and management, 50. Medicine and health had the least applications, 2. As for the passing rate, although there were only two applications in medicine and health, both passed, so the passing rate was 100.00%, the highest. The passing rate of language learning was the lowest, only 33.33%.

TABLE IV. STATISTICS OF APPLICATIONS AND PASSING IN EACH SUBJECT FIELD

FIELD	APPLICATION	PASSING	RATE
Computer and info. science	100	50	50.00%
Finance and management	54	27	50.00%
Language learning	9	3	33.33%
Literature and arts	13	5	38.46%
Education and learning	24	12	50.00%
Medicine and health	2	2	100.00%
Social science	43	27	62.79%
Living science	3	2	66.67%
Natural science	23	16	69.57%
Living application	7	5	71.43%
Total	278	149	53.60%

In terms of required indicators, indicator 4-2, active teacher-student discussions in non-simultaneous teaching, was in the top three ranking of failing to pass in 9 fields, excluding only the field of medicine and health. In 5 subject fields, it ranked first. As for indicator 5-1, in non-simultaneous teaching, abundant cross-discussions among learners toward course-related issues, it ranked first in four fields, language learning, social science, living science, and natural science. It was also in the rank of other four fields. Indicator 6-3, results and feedbacks were provided for the on-line tests or evaluation activities, was also in the rank of 6 fields. As a result, we can conclude that in terms of the required indicators for e-learning, in simultaneous or non-simultaneous teaching, it is quite difficult to have active cross-discussions between the teacher and students. It is also difficult for teachers to give feedbacks on on-line tests. The required indicators that are ranked top three of failing to pass are listed in Table V.

TABLE V. A LIST OF THE REQUIRED INDICATORS THAT ARE RANKED TOP THREE OF FAILING TO PASS

REQUIRED INDICATOR	DESCRIPTION	FIELD
4-2	Active teacher-student discussions in non-simultaneous teaching	9
5-1	In non-simultaneous teaching, abundant cross-discussions among learners toward course-related issues	8

REQUIRED INDICATOR	DESCRIPTION	FIELD
6-3	Results and feedbacks were provided for the on-line tests or evaluation activities	7
4-3	The teacher can quickly answer the questions from the learners in the course discussion section	5
6-2	The course and unit teaching goals are covered in the curricula and teaching activities	5
2-1	On-line tests or evaluation activities are provided in the course web pages	4

In terms of optional indicators, 4-4, in simultaneous teaching, both the teacher and the students can actively participate in course-related discussions, was in the top three ranking of failing to pass in 8 fields. In 5 subject fields, it ranked first, in 3 fields, second. Indicator 5-3, there is appropriate interaction when learners participate in simultaneous course-related discussions, also ranked top three of failing in 8 fields. In 2 fields, it ranked first, in 5 fields, second, in 1 field, third. This result corresponds to the result of required indicators. Both are about the problem of interaction and discussion in teaching. The optional indicators that are ranked top three of failing to pass are listed in Table VI.

TABLE VI. A LIST OF THE OPTIONAL INDICATORS THAT ARE RANKED TOP THREE OF FAILING TO PASS

OPTIONAL INDICATOR	DESCRIPTION	FIELD
4-4	In simultaneous teaching, both the teacher and the students can actively participate in course-related discussions	8
5-3	There is appropriate interaction when learners participate in simultaneous course-related discussions	8
6-5	The learners' works are exhibited on-line	6
4-5	The teacher provides regular "on-line office hours" for learners to interact with the teacher	5
7-5	The teacher holds a face-to-face subject review meeting with the students and puts the minutes of the meeting on-line	5

Below is an analysis of the 278 applications in terms of the key failing factors in each subject field. A comparison of the required and optional indicators that ranked top three of getting a grading B in each field is shown in Table VII below.

TABLE VII. A COMPARISON OF THE KEY INDICATORS CAUSING THE FAILURE OF CURRICULUM CERTIFICATION

R = required O = optional

FIELD	R	R	R	O	O	O
Computer and info. Science (50)	4-2(28)	5-1(26)	6-3(18)	5-3(35)	4-4(33)	3-4(22) 6-5(22)

FIELD	R	R	R	O	O	O
Finance and management (27)	4-2(13)	5-1(11)	2-1(10) 4-3(10) 6-3(10)	6-5(23)	4-4(22)	5-3(20)
Language learning (6)	5-1(6)	2-1(5) 4-2(5) 6-3(5)	1-3(3)	4-4(11) 4-5(11)	5-3(10)	6-5(8)
Literature and arts (8)	4-3(5)	4-2(3) 5-1(3) 6-3(3)	6-2(2) 7-2(2) 8-1(2)	4-4(5) 5-3(5)	3-5(2) 5-2(2) 6-4(2) 6-5(2) 7-3(2)	2-4(1) 3-6(1) 4-5(1) 7-5(1)
Education and learning (12)	2-1(5)	1-1(4) 1-2(4) 4-2(4) 4-3(4)	6-2(3) 6-3(3)	4-5(9)	4-4(6) 5-3(6)	7-5(5)
Medicine and health (0)						
Social science (16)	5-1(12)	4-2 (11)	6-3(10)	4-4(14)	5-3(12) 7-5(12)	6-5(10)
Living science (1)	4-2(1) 5-1(1) 6-2(1) 8-1(1)			1-4(1) 2-4(1) 5-2(1) 6-4(1) 6-5(1) 7-3(1) 7-4(1) 7-5(1)		
Natural science (7)	4-2(4) 5-1(4)	8-1(3)	2-2(2) 3-1(2) 4-3(2) 6-2(2) 6-1(2)	4-4(7) 5-3(7)	4-5(5) 5-2(5)	7-3(4) 7-5(4)
Living application (2)	2-2(2) 4-2(2) 6-2(2) 6-3(2)	2-1(1) 3-1(1) 3-3(1) 4-1(1) 4-3(1) 5-1(1)		4-4(4) 5-3(4)	4-5(3)	3-4(2) 3-5(2) 3-6(2)

VI. DISCUSSION

In the 10 batches in this research, there had been 278 e-learning curriculum applications in total, divided into 10 fields. There had been most applications in the fields of computer and information science and finance and management, 154 in total, 55.4% of the total application. Both the passing rates were 50%. In terms of item and order, the 3 major required indicators which caused the failure of certification in the courses of computer and information science were totally identical with the 3 major required indicators which caused the failure of certification in total e-learning courses. Because comparatively there had been more failing applications in the field of computer and information science, a general weakness can be concluded from the statistics in recent years:

The required indicator 4-2, active teacher-student discussions in simultaneous or non-simultaneous teaching: in many applications, the students participated in the on-line course discussion section less than once every three weeks,

or the teacher participated in the on-line course discussion section less than once every week. There were no active and abundant discussions, so the certification failed.

The required indicator 5-1, in non-simultaneous teaching, abundant cross-discussions among learners toward course-related issues: in non-simultaneous teaching, every learner participated in the discussion about course-related issues less than 30%. There were no properly-designed learning activities, or the activities were not closely-related to the course. There was neither off-line testing nor self-evaluation to provide explanations or opinions. There were no appropriate examples or demonstrations, so the students didn't realize there were flaws in the course and needed to be improved. These were also the reasons why the certification failed. E-learning does not mean directly digitalizing traditional courses and letting students view them on-line. The focuses should be strengthening teaching strategies and assessing appropriate methods to diversify the course content.

The required indicator 6-3, results and feedbacks were provided for the on-line tests or evaluation activities: in most applications, learners could just know whether their answers were right or wrong in the course on-line tests or evaluation activities. There were no explanations or feedbacks. The learners couldn't know the reason of their mistakes, so their learning achievements were affected.

In terms of optional indicators, it was obvious that in the 10 subject fields, indicator 4-4, in simultaneous teaching, both the teacher and the students can actively participate in course-related discussions, was the most difficult to pass. If optional indicators make the certification fail, it's because they result in an average grade lower than A. However, in the applications in this research, no certification was failed because of indicator 4-4 causing an average grade lower than A. The reason is there are a lot of indicators in criterion 4, and for some indicators, it is not difficult to get an A+.

VII. CONCLUSION AND SUGGESTIONS

It's been ten years since the e-learning certification system started in Taiwan. Its development has become steady and mature, and the certification indicators have been revised to become more concise and appropriate. If teachers in universities are interested in applying e-learning courses, this research will be a good reference to help them promote curriculum quality and pass the certification. Through the statistical analyses of the 278 e-learning course certification applications in recent years, the key indicators that affected the certification had been concluded. Also, through the categorization of subject fields, we can compare in different fields, which required indicators are key to passing the certification, and whether the optional indicators affect the result of certification. In the statistical results in this research, we can find out the fact that in the general average of the 10 fields and the field of computer and information science, which had most applications, the key required indicators were both 4-2, 5-1, and 6-3. In the field of finance and management, which had second most applications, the key required indicators were also 4-2, 5-1, and 6-3. In the field of social science, which had third most applications, the key required indicators were 5-1, 4-2, and 6-3 in the rank order. In terms of optional indicators, 4-4, 5-3, and 6-5 had influences on passing the certification or not. Through this research, we can understand in each subject field, no matter in required or optional indicators, peer or teacher-student active interaction and participation in discussions are the key indicators for e-learning courses to pass the certification. It is also the part that needs to be improved in university curriculum.

In this research, we found out the teachers still focused on lecturing. They didn't use important teaching strategies and diversified evaluation methods. There were lacks in intriguing learning motivation or promoting learning cooperation. How to improve the effectiveness of learning and facilitate teacher-student or peer interaction are all the key factors for promoting the quality of e-learning curriculum.

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