

Development of e-Competency Framework for e-Learning Instructional Designer

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Abstract

Background/Objectives: e-Learning becomes a universal educational method due to development of ICT. The contents of e-learning are delivered to learners with appropriate instructional design. **Methods/Statistical Analysis:** The instructional design is one of elements which have influence on learning effect of e-learning. The competency of instructional designer plays an important role in e-learning and it controls success of e-learning. **Findings:** This study divides competencies of instructional designer into such 9 competency units as 'need analysis', 'analysis of system environment', 'planning project', 'designing contents', 'developing manuscript', 'developing storyboard', 'developing contents', 'test and evaluation of contents' and 'completion of contents'. It also provides 35 competency elements according to each unit for example 'analyzing customers' requirements', 'analysis of learning target'. The validity test had been done by 29 experts who have experienced more than 5 years in the field participated in the questionnaire. The results of validity test show that all competency units are valid. In this study, the e-competency framework that has 9 competency units and 35 elements was presented for e-learning instructional designer. Furthermore, the competency element with high importance mostly shows high level of difficulty in the degree of work difficulty. **Improvements/Applications:** The results of this study will be useful in development of training programs for e-learning instructional designers and e-competency system development for competency management.

Keywords: Designer, e-Learning, e-Competency, Framework, Instructional Design

1. Introduction

e-Learning is learning facilitated by information and communications technology¹. Making good use of ICT such as computer and internet in education, e-learning overcomes weakness of traditional education and enhances teaching efficiency. There are limits in tailored classes of traditional education. The traditional education provides fixed teaching contents in designated places. There are also limits in interactions. The information society with producing and delivering various information needs new methods in the field of education, too. Learners who live in the information society use computer and web every day and they willingly use such digital communication skill as SNS. These social environments and learners' distinctiveness are reflected into e-learning.

The role of instructional designer in e-learning is making and delivering contents to learners. These contents are planned and designed by teachers. In traditional education teacher directly teaches learners based on instruction strategy. Unlike face-to-face teaching teachers in e-learning do not directly contact learners. In e-learning contents connect teachers with learners.

Thus based on contents which teachers want to deliver the instructional designer selects teaching and learning strategy and plans various multimedia data.

According to 2015 e-learning statistics of Korea, it takes about 20% of e-learning industry. The number of contents developer is reaching 21.6% which is the highest rate among entire number of e-learning industry².

Since the role of instructional designers becomes important, it is time to discuss about their competencies.

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This study suggests competency elements of instructional designers for developing qualified e-learning contents. These suggestions come with opinions of experts.

2. Related Works

Internationally accepted definition of the instructional design is “systematic and systemic instructional planning including needs assessment, development, evaluation, implementation and maintenance of materials and program s”¹. Richey and colleagues presented that the field of instructional design has a number of established or emerging specialist roles (ex, four roles—analyst, evaluator, e-learning specialist, and project manager)³.

IBSTPI(International Board of Standards for Training, Performance and Instruction) suggests competencies of instructional designers. There are such subcategories as ‘Job role’, ‘Job behaviors’, ‘Accepted standards’, and ‘Vision of the future’⁴. There is a study on defining competency of e-learning instructional designers in Korea. This study suggests 23 competencies and compares importance of competencies⁵. In the study of developing job competency in e-learning industry competencies of e-learning instructional designers are suggested as essential and general competencies. These competencies are suggested according to step of planning, designing and developing contents⁶. There are such classifications as ‘fundamental competency’, ‘plan and analysis’, ‘design and development’⁷.

Focusing on planning and analyzing contents development another study suggests competencies of instructional designers as ‘competency in need analysis of instructional design’, ‘competency in analyzing learning contents’⁸.

Recently there are studies on definition of competency which consider contents development based on such new ICT environment as Web 2.0, augmented reality and 3D. In the age of Web 2.0 the competency which are emphasized as competencies of instructional designers consist of 5 areas and 9 items such as ‘professional basic grounding’, ‘learning theory’. There are ‘general literacy competency’, ‘basic competency in instructional design’, ‘competency in understanding and using technology’, ‘competency in operation and management’, ‘competency in self-management’^{9,10}. With consideration for mobile learning there are suggestions of evaluation methods for instructional designers. They consider connectivity of ‘usability’, ‘accessibility to contents’ and ‘pedagogical theory’¹¹.

The preceding studies mainly deal with theory without considering a field. Thus it is necessary to provide

practical competencies of instructional designers in the field. It is also necessary to have a plan to connect theory of e-learning contents development and carry it out^{12,13}.

3. Design of e-Competency Framework

After collecting opinions from experts this study suggests 9 units of instructional design competency; ‘need analysis’, ‘analysis of system environment’, ‘planning project’, ‘designing contents’, ‘developing manuscript’, ‘developing storyboard’, ‘developing contents’, ‘test and evaluation of contents’, ‘completion of contents’.

Based on 9 units this study suggests competency elements in-detail. And collecting opinions from experts is executed for the second time. It is conducted by using questionnaire. The e-learning contents designers who have experienced more than 5 years in the field participated in the questionnaire. Using SPSS v.18.0 data of 29 questionnaire is analyzed.

The results of each competency unit are as follows.

The competency unit of ‘need analysis’ are ‘analyzing customers’ requirements’, ‘analyzing learners’, ‘analyzing learning contents’. The table 1 shows the result of analyzing level of importance and job difficulty of ‘need analysis’.

In the area of importance ‘analyzing customers’ requirements’ marks the highest point. ‘analyzing learning contents’ and ‘analyzing learners’ follow. In the area of job difficulty ‘analyzing customers’ requirements’ marks the highest point, too.

The competency unit of ‘analysis of system environment’ are ‘analyzing functions of Learning Management System’, ‘analyzing functions of Learning Contents Management System’, ‘analyzing learning equipment of learners’, ‘analyzing environment of contents development’. The result of analyzing level of importance and job

Table 1. Analyzing level of importance and job difficulty of need analysis

Element of competency	Importance(N=29)		Job difficulty(N=29)	
	M	SD	M	SD
Analyzing customers’ requirements	4.72	.528	4.17	.468
Analyzing learners	4.48	.738	3.66	.814
Analyzing learning contents	4.69	.471	3.90	.618

difficulty of each unit in analyzing of system environment is shown on table 2.

In the area of importance 'analyzing environment of contents development' marks the highest point and is followed by 'analyzing learning equipment of learners'. In the area of job difficulty 'analyzing environment of contents development' marks the highest point.

The competency unit of 'planning project' are 'defining customers' requirement and range', 'planning resources', 'defining Work Breakdown Structure (WBS)', 'establishing development schedule', 'planning quality control', 'planning maintenance control'. The result of analyzing level of importance and job difficulty of 'planning project' is shown on table 3.

In the area of importance 'defining customers' requirement and range' marks the highest point and is followed

Table 2. Analyzing level of importance and job difficulty of analyzing environment of system

Element of competency	Importance(N=29)		Job difficulty(N=29)	
	M	SD	M	SD
Analyzing functions of LMS	3.59	.867	3.21	.861
Analyzing functions of LCMS	3.59	.825	3.31	.891
Analyzing learning equipment of learners	3.76	.739	3.21	.774
Analyzing environment of contents development	4.28	.649	3.52	.785

Table 3. Analyzing level of importance and job difficulty of need analysis

Element of competency	Importance(N=29)		Job difficulty(N=29)	
	M	SD	M	SD
Defining customers' requirement and range	4.59	.733	4.24	.577
Planning resources	4.14	.743	4.00	.845
Defining work breakdown structure(WBS)	4.38	.677	3.93	.704
Establishing development schedule	4.52	.738	3.66	.936
Planning quality control	4.14	.743	3.41	.568
Planning maintenance control	3.48	.911	3.21	.491

by 'establishing development schedule'. In the area of job difficulty 'defining customers' requirement and range' marks the highest point.

The competency unit of 'designing contents' are 'establishing instruction strategy', 'composing learning flow', 'establishing UI/design strategy'. The result of analyzing level of importance and job difficulty of 'designing contents' is shown on table 4.

In the area of importance 'establishing instruction strategy' marks the highest point and is followed by 'composing learning flow' and 'establishing UI/ Web design strategy'. In the area of job difficulty 'establishing instruction strategy' marks the highest point.

The competency unit of 'developing manuscript' are 'making a guide for contents development', 'managing manuscript development of contents expert', 'analyzing contents of manuscript'. The result of analyzing level of importance and job difficulty of 'developing manuscript' is shown on table 5.

In the area of importance 'managing manuscript development of contents expert' marks the highest point and is followed by 'analyzing contents of manuscript'. In the area

Table 4. Analyzing level of importance and job difficulty of designing contents

Element of competency	Importance(N=29)		Job difficulty(N=29)	
	M	SD	M	SD
Establishing instruction strategy	4.62	.561	4.31	.604
Composing learning flow	4.21	.559	3.76	.689
Establishing UI/ Web design strategy	3.97	.731	3.79	.675

Table 5. Analyzing level of importance and job difficulty of developing manuscript

Element of competency	Importance(N=29)		Job difficulty(N=29)	
	M	SD	M	SD
Making a guide for contents development	4.52	.634	3.52	.871
Managing manuscript development of contents expert	4.72	.455	4.28	.649
Analyzing contents of manuscript	4.59	.628	3.93	.884

of job difficulty 'managing manuscript development of contents expert' marks the highest point.

The competency unit of 'developing storyboard (SB)' are 'developing a guide for SB development', 'writing SB', 'reviewing and amending SB', 'developing a prototype', 'reviewing and amending a prototype'. The result of analyzing level of importance and job difficulty of 'developing storyboard' is shown on table 6.

In the area of importance 'developing a prototype' marks the highest point and is followed by 'developing a guide for SB development'. In the area of job difficulty 'developing a prototype' marks the highest point.

The competency unit of 'developing contents' are 'writing recording manuscript and managing audio file', 'filming video and managing file', 'developing animation (flash etc.)', 'managing progress of contents development', 'reviewing contents development and amendment'. The result of analyzing level of importance and job difficulty of 'developing contents' is shown on table 7.

In the area of importance 'managing progress of contents development' marks the highest point and is followed by 'reviewing contents development and amendment'. In the area of job difficulty 'managing progress of contents development' marks the highest point.

The competency unit of 'test and evaluation of contents' are 'analyzing satisfaction of learners', 'reflecting opinions of experts', 'reflecting opinions of customers'. The result of analyzing level of importance and job difficulty of 'test and evaluation of contents' is shown on table 8.

In the area of importance 'reflecting opinions of customers' marks the highest point and is followed by

Table 6. Analyzing level of importance and job difficulty of developing storyboard

Element of competency	Importance(N=29)		Job difficulty(N=29)	
	M	SD	M	SD
Developing a guide for SB development	4.52	.829	3.69	.806
Writing SB	4.14	.639	3.45	.686
Reviewing and amending SB	3.93	.704	3.03	.680
Developing a prototype	4.86	.351	4.07	.799
Reviewing and amending prototype	4.38	.677	3.55	.783

Table 7. Analyzing level of importance and job difficulty of contents development

Element of competency	Importance(N=29)		Job difficulty(N=29)	
	M	SD	M	SD
Writing recording manuscript and managing audio file	3.55	.948	2.41	.682
Filming video and managing file	3.83	1.002	2.93	.799
Developing animation (flash etc.)	3.76	1.023	3.41	1.018
Managing progress of contents development	4.28	.841	3.90	.817
Reviewing contents development and amendment	4.00	.802	3.21	.559

Table 8. Analyzing level of importance and job difficulty of 'test and evaluation of contents'

Element of competency	Importance(N=29)		Job difficulty(N=29)	
	M	SD	M	SD
Analyzing satisfaction of learners	4.07	.799	3.45	.686
Reflecting opinions of experts	4.17	.711	3.31	.541
Reflecting opinions of customers	4.28	.591	3.69	.660

'reflecting opinions of experts'. In the area of job difficulty 'reflecting opinions of customers' marks the highest point.

The competency unit of 'completing contents' are 'inspecting contents', 'posting LMS', 'writing completion report'. The result of analyzing level of importance and job difficulty of 'completing contents' is shown on table 9.

In the area of importance 'inspecting contents' marks the highest point and is followed by 'posting LMS'. In the area of job difficulty 'inspecting contents' marks the highest point.

Based on the result of validity test this study suggests the e-competency framework of instructional designers are as followings. (Table 10)

Table 9. Analyzing level of importance and job difficulty of completing contents

Element of competency	Importance(N=29)		Job difficulty(N=29)	
	M	SD	M	SD
Inspecting contents	4.41	.628	3.31	.802
Posting LMS	4.07	.753	3.10	.673
Writing completion report	3.83	.805	3.21	.620

Table 10. e-competency framework

Competency units	Elements of competency unit	Note
Need analysis	Analyzing customers' requirements	
	Analyzing learners	
	Analyzing learning contents	
Analyzing environment of system	Analyzing functions of LMS	
	Analyzing functions of LCMS	
	Analyzing learning equipment of learners	
	Analyzing environment of contents development	
Planning project	Defining customers' requirements and range	
	Planning resources	
	Defining WBS(work breakdown structure)	
	Establishing development schedule	
	Planning quality control	
Designing contents	Planning maintenance control	
	Establishing instruction strategy	
	Composing learning flow	
Developing manuscript	Establishing UI/Design strategy	
	Making guide for contents development	
	Managing manuscript development of contents expert	
Developing storyboard	Analyzing contents of manuscript	
	Developing guide for DS development	
	Writing SB	
	Reviewing and amending SB	
	Developing prototype	
Developing contents	Reviewing and amending prototype	
	Writing recording manuscript and managing audio file	
	Filming video and managing file	
	Developing animation (flash etc.)	
	Managing progress of contents development	
Test and evaluation of contents	Reviewing contents development and amendment	
	Analyzing satisfaction of learners	
	Reflecting opinions of experts	
Completion of contents	Reflecting opinions of customers	
	Inspecting contents	
	Posting LMS	
	Writing completion report	

4. Conclusions

Since e-learning learners use e-learning contents, it is very important how to design contents and it would decide success of e-learning. Based on learning contents and instructional strategy which are provided by teachers e-learning instructional designers should design e-learning contents with excellent studying effect. It is necessary for instructional designers to have fundamental competencies.

This study suggests 9 competency units focusing on duties of instructional designers and also provides elements of competency units. 9 competency units are 'need analysis', 'analyzing environment of system', 'planning project', 'designing contents', 'developing manuscript', 'developing storyboard', 'developing contents', 'test and evaluation of contents', 'completion of contents'. The entire competencies which are suggested in this study are valid. According to analysis results of competency elements the more important element in the area of importance shows the higher difficulty in the area of job difficulty.

The suggestions using the results of this study are as followings;

Firstly, it is necessary to develop various training programs for development of working competencies of instructional designers.

Secondly, it is necessary to develop and manage e-competency system which manages competency of instructional designers.

Thirdly, it is necessary to revise curriculum focusing on duties in order to raise capable instructional designers.

Fourthly, it is necessary to strengthen the evaluation system of contents by users and provide continuous feedback.

The competency units and elements of competency units which are suggested in this study can be used as recruiting standards in managing, training instructional designers and the labor market.

5. Acknowledgment

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