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ORIGINAL PAPER

Applying Non-synchronized E-learning to the Nursing Clinical Ladder System

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Abstract The time and spatial constraints of face-to-face learning often affect nursing staff's inclination to enroll in ladder system training classes. Hence, their competence in clinical care may be unable to meet the requirements of the hospitals they work at. The e-learning mechanism offers a way to overcome such constraints. However, the differences in learners' achievement and satisfaction between traditional face-to-face and non-synchronized e-learning classes in the nursing clinical ladder system have not been thoroughly investigated. In this study, 155 nursing personnel serving at the case hospital, enrolled in N1/N2 ladder courses, were invited to participate as the subjects. The results showed that those who attended face-to-face learning classes reported higher satisfaction but achieved less in class than those in the e-learning class. The factors which influence the subjects' satisfaction with e-learning were investigated and summarized.

Keywords Non-synchronized e-learning · Nursing clinical ladder system · E-learning platform

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Introduction

The nursing staff makes up the majority of any hospital workforce and works on the front line in direct contact with patients. Their abilities are thus closely related to the hospitals' overall efforts to consolidate medical care quality and service efficiency. With advances in medical treatment and technology, nursing work has become increasingly complicated, so that the training offered by nursing schools is unlikely to keep pace with the latest developments. Consequently, nurses may feel frustrated with their work, or even quit the profession. Therefore, hospitals generally require their nursing personnel, whether novice or experienced, to continue learning new skills and maintaining their abilities [1].

The clinical ladder system was first introduced in the United States in the 1970s to address the short work seniority and high turnover rates of nursing graduates due to the substantial knowledge and skill gaps that existed with regard to clinical service techniques [2]. It has been verified that the nursing personnel of hospitals operating such ladder systems tend to exhibit higher work satisfaction and independence [3]. Furthermore, a clinical competence classification system can not only motivate nursing personnel to strengthen their competence and proficiency, but also expand the scope of their services [4, 5]. One of the most

important policies drafted by the Taiwan Nurses Association (TNA) was to promote a clinical proficiency ladder system in order to enhance practical nursing skills. In 1992, the TNA conducted an experimental project of "Implementing a Clinical Proficiency Ladder System for Entry Level Nursing Personnel" which was supported by the Department of Health and offered a series of systematic training courses at various levels of competence. With the Department of Health's support and the TNA's promotion, the Chang Gung Memorial Hospital was the first in Taiwan to implement a proficiency ladder system in 1993. By the end of 1994, a total of 89 hospitals across Taiwan had introduced similar systems, and this number had risen to 151 in 2001. Consequently, the Department of Health decided to include the proficiency ladder system as one of the key criteria in the accreditation of teaching hospitals.

Nurses are usually required to work in a three-shift rotation schedule in order to meet the needs of caring for inpatients. Most of the ladder training arranged by the hospitals consists of traditional classroom lectures. The scheduling of lessons would thus often conflict with the nurses' working hours and make it difficult for them to allocate time for such training. This has obviously discouraged many personnel from taking part in such classes, and significantly hindered the promotion of on-the-job training (OJT).

E-learning classes incorporate various types of information technology, educational media, and teaching strategies, and have a number of advantages over traditional classes. For example, the flexibility of e-learning makes it well-suited for employees with irregular working hours [6]. Recently, various forms of e-learning have already become well-established in medical and health care education [7–12]. However, the differences in the learning results and satisfaction found with the traditional and e-learning clinical ladder system have rarely been investigated, and thus the aim of this study is to address this gap in the literature.

Nursing ability and the ladder system

The concept of a clinical ladder system was first proposed by Creighton in 1964, and then expanded by Zimmer, who indicated that a comprehensive clinical ladder scheme should involve three phases: the "entry level", "intermediate", and "advanced practice" [13]. Benner further employed the Dreyfus model of skill acquisition and proposed a five-stage career development path: "novice", "advanced beginner", "competent", "proficient", and "expert" [14] as a hierarchical structure to facilitate nursing career development and wage/bonus classification [15]. Pettno also supported the idea that the clinical ladder system was a means of verifying proficiency and offering corresponding recognition and financial feedback to promote nurses' responsibility and accountability [16]. Similarly, some have scholars observed that the effectiveness of the clinical ladder system reduces the turnover rate and improves the performance of the nursing staff [14, 17]. Moreover, Froman concluded that the purpose of a clinical ladder system is to maintain a hospital's quality of service by differentiating the nursing staff's level of competence [18].

The TNA defines a nursing proficiency ladder (i.e. a clinical ladder) as a system with a hierarchical structure that can be divided into four levels associated with an individual's clinical abilities and proficiency growth (see Fig. 1). Every level has a different development plan and training courses. After meeting all of the ladder requirements, the nurses may choose to become administrative managers or specialized nurses, depending on their proficiency and interests.

Materials and methods

The case hospital is a regional hospital with 645 beds for acute and chronic illnesses. The hospital currently has 590 nursing personnel and over 95% of the staff are registered nurses with qualifications ranging from N0 to N4. The subjects of this study were selected from the staff who enrolled in the hospital's 2007 nursing care proficiency ladder N1 and N2 courses and consented to take part in this research. The subjects were free to choose their preferred style of learning and participate in a face-to-face or non-synchronized e-learning group. The total number of subjects was 171, with 100 and 71 for the N1 and N2 level classes respectively. A total of 155 subjects (with 87 and 68 for the N1 and N2 level classes respectively) finished all the courses and then completed a questionnaire to evaluate each class that they took, and all the returned questionnaires were in a valid condition.

There were a total of eight classes each for the N1 and N2 levels (details shown in Appendix 1), which were selected by the education and training committee of the case hospital. The instructors for both N1 and N2 ladder classes included specialized physicians, nursing directors, and supervisors from the case hospital. Every class lasted for 50 min and there were eight classes in each ladder level.

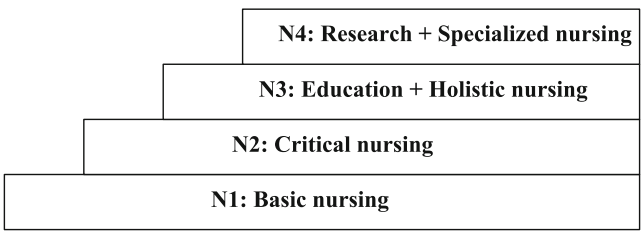

Fig. 1 Competence ladder structure and differentiation at each level

The learning platform chosen was the WM Pro Online Learning and Management Platform software, which was modified by information systems department of the case hospital according to needs of the courses offered. The e-learning platform contained the following functions: (1) learning platform management; (2) user privilege management; (3) an integrated learning center; (4) a course material management center; and (5) an evaluation center. All of the course videos and related content, including slides and tests, could be accessed via the web site.

Both learning setting used the same teaching contents and instructors to avoid bias. The only difference was that the face-to-face learning group attended classes at fixed times in a traditional classroom located in the case hospital and with the presence of an instructor. A video recorded the face-to-face teaching process which was uploaded to the digital learning platform on the same day. The learners in the e-learning setting engaged in self-study on the digital learning platform using the video recording from the face-to-face classes at the time and place of their choices. For both face-to-face and non-synchronized e-learning, there was a test after each lecture had finished. The subjects' scores in these tests were chosen to represent their learning results for that class. Regarding their satisfaction with the class, a semi-structured questionnaire was designed as a based on the OJT evaluation form used by the hospital's nursing care department. The subjects in the face-to-face learning group were asked to complete a printed satisfaction survey questionnaire at the end of every class, while the subjects in the e-learning group were asked to complete the same questionnaire online. The questionnaire had a five-point Likert scale, for which 1 represented "very unsatisfied", 5 "very satisfied", and 0 represented "no comment". It included 10 questions to rate the instructor's clinical care abilities, the teaching materials, guiding students or motivating them to raise questions, as well as questions on the lecture style, classroom location, course scheduling, interaction among students, the effort that the subjects put in to learning the courses, the overall learning environment, and improvement in the subjects' clinical care abilities after taking the class. There was also a multiple choice question about factors that disrupted their learning, and finally a section to obtain other comments and their suggestions about the course (see Appendix 2). Ten subjects were used in the pretest in order to assess the suitability of the instrument. The Cronbach's α was calculated to determine the reliability of the measurement scale, and the high value of 0.868 indicated that the instrument possessed high reliability.

In order to examine the learners' satisfaction and learning results for both learning styles, two hypotheses were developed as follows:

H1: The test scores for the e-learning class will differ from those for the face-to-face learning class.

H2: The satisfaction score of the e-learning class will differ from that of the face-to-face learning class.

Results

Basic information about the subjects

The average age of the subjects at the N1 level was 28.4 years old, with the oldest subject being 46 and the youngest 22. For the N2 level subjects, the oldest was 50 years of age while the youngest was 23, and the average age was 29.9 years old. Most of the subjects were single, had graduated from vocational college and certified as registered nurses. About 30% of the N1 and about 43% of N2 subjects had work experience of more than 6 years, and thus most of them had acquired no professional accreditation in over 5 years. More than 40% of the subjects were from general wards, while the remainders were from ICU, operating room and other units. The subjects who worked in operating rooms all chose e-learning classes. All demographic data can be seen from Table 1.

Analysis of the test scores for the face-to-face and e-learning groups

The assessment of the learning results was conducted through an online test system which offered the advantages of immediate feedback by providing the correct answers to each question. The mean scores for the face-to-face (F2F) and e-learning group were 73.0, 72.8 points for the N1 level, and 71.4 and 78.5 points for the N2 level, respectively (please see Table 2 for details). The result indicated that the average test scores of N2 in non-synchronized learning are higher than face-to-face, while the average test scores of N1 is the opposite, though the difference is not significant. A follow up interviewing of couples learners revealed that the N1 courses are rather easier and the N2 courses are much in depth. With the non-synchronized learning setting, learners can stop and rewind repeatedly whenever they can not comprehend the materials. Therefore, test scores of N2 in non-synchronized learning setting are higher.

The independent *t*-test showed that the mean test scores between the two learning groups were significantly different for the N2 level, with a *p*-value of less than 0.05, while the average test scores were about the same between the two learning groups for the N1 level. In other words, the first hypothesis was partially supported, as those subjects who took the N2 level e-learning class had higher average test scores than those who took the face-to-face class.

Table 1 Analysis of subjects' background

Classification		Rank				Learning type			
Classes		N1		N2		F2F		Online	
Total		87		68		64		91	
Age	20–25	36	41.4%	9	13.2%	22	34.4%	23	25.3%
	26–30	29	33.3%	37	54.4%	26	40.6%	40	43.9%
	31–35	14	16.1%	16	23.6%	13	20.3%	17	18.7%
	Over 36	8	9.2%	6	8.8%	3	4.7%	11	12.1%
Marital status	Married	11	12.6%	19	27.9%	13	20.3%	17	18.7%
	Single	76	87.4%	49	72.1%	51	79.7%	74	81.3%
Level of education	University	12	13.8%	14	20.6%	8	12.5%	18	19.8%
	Vocational C.	73	83.9%	53	77.9%	55	85.9%	71	78.0%
	Vocational H.	2	2.3%	1	1.5%	1	1.6%	2	2.2%
Type of license	Registered N.	68	78.2%	59	86.8%	52	81.3%	75	82.4%
	Nurse	19	21.8%	9	13.2%	12	18.7%	16	17.6%
Work years	1–5	61	70.1%	39	57.3%	41	64.1%	59	64.8%
	6–10	17	19.5%	16	23.5%	15	23.4%	18	19.8%
	11–15	5	5.8%	8	11.8%	5	7.8%	8	8.8%
	Over 16	4	4.6%	5	7.4%	3	4.7%	6	6.6%
Type of unit	General ward	38	43.7%	30	44.1%	34	53.1%	34	37.3%
	ICU	8	9.2%	12	17.6%	11	17.2%	9	9.9%
	Operating room	25	28.7%	4	5.9%	0	0.0%	29	31.9%
	Other units	16	18.4%	22	32.4%	19	29.7%	19	20.9%

Unit no. of subjects

An analysis of the satisfaction scores for the face-to-face learning and e-learning groups

The mean satisfaction scores for all the classes for each group are presented in Table 2. All of the satisfaction scores for the e-learning classes were lower than those for the traditional face-to-face learning ones. At the N1 level, there were four face-to-face learning classes that the subjects rated with significantly higher satisfaction scores than the e-learning classes, namely the first, fourth, fifth, and seventh classes (an asterisk in the sig. column indicates a significant difference). With regard to the N2 level, the subjects in the face-to-face classes expressed significantly higher levels of satisfaction. In other words, the second hypothesis, that the average satisfaction with the classes for both groups was different, was supported.

Table 2 Average scores of ladder learning

Ladder level	N1			N2		
Results	Face-to-face learning	E-learning learning	Sig.	Face-to-face learning	E-learning learning	Sig.
Average test score	73.0	72.8		71.4	78.5	$p<0.05$
Average satisfaction score	3.8	3.5		4.0	3.4	$p<0.05$
1st lesson	3.7	3.5	$p<0.05$	4.0	3.5	$p<0.05$
2nd lesson	3.6	3.5		3.9	3.5	$p<0.05$
3rd lesson	3.7	3.5		3.8	3.4	$p<0.05$
4th lesson	3.9	3.5	$p<0.05$	4.2	3.5	$p<0.05$
5th lesson	3.9	3.6	$p<0.05$	3.8	3.5	$p<0.05$
6th lesson	3.7	3.6		4.1	3.5	$p<0.05$
7th lesson	3.8	3.4	$p<0.05$	4.0	3.3	$p<0.05$
8th lesson	3.7	3.5		4.0	3.3	$p<0.05$

Table 3 Aspects of satisfaction for N1 classes

Questions		Ladder course							
		1st lesson	2nd lesson	3rd lesson	4th lesson	5th lesson	6th lesson	7th lesson	8th lesson
Q1. Instructor's clinical care ability	F2F	4.2*	3.6	3.8	4.0	3.9	3.7	3.9*	3.9
	Online	3.7	3.8	3.6	3.7	3.7	3.7	3.5	3. 7
Q2. Course material	F2F	4.0	3.7	4.0*	4.1*	4.1*	3.9	3.8	3.9
	Online	3.7	3.7	3.7	3.7	3.8	3.8	3.5	3.7
Q3. Instructor prompted students to ask questions	F2F	3.3	3.5	3.7*	4.0**	4.0**	3.5	3.7	3.5
	Online	3.5	3.6	3.3	3.5	3.6	3.6	3.4	3.5
Q4. Instructor's lecture style overall	F2F	3.9**	3.6	3.7	4.2***	4.1***	3.8	3.9*	3.9
	Online	3.5	3.6	3.5	3.5	3. 7	3.6	3.5	3.6
Q5. Location of the class	F2F	3.7	3.7	3.7	3.7	3.8	3.5	3.5	3.7
	Online	3.4	3.5	3.4	3.4	3.5	3.5	3.3	3.5
Q6. The scheduling of class	F2F	3.4	3.4	3.6	3.7	3.6	3.5	3.6	3.6
	Online	3.4	3.5	3.4	3.3	3.5	3.5	3.3	3.4
Q7. Your interaction with classmates	F2F	3.4	3.4	3.4	3.7	3.7	3.6	3.4	3.5
	Online	3.2	3.2	3.3	3.4	3.5	3.5	3.4	3.4
Q8. Overall learning environment	F2F	3.9**	3.6	3.6	3.9*	3.7	3.6	3.8*	3.7
	Online	3.4	3.4	3.4	3.4	3.5	3.5	3.4	3.4
Q9. The effort you have spent	F2F	3.7	3.8	3.5	4.1***	4.0**	3.7	3.9**	3.9*
	Online	3.5	3.6	3.5	3.4	3.6	3.5	3.5	3.5
Q10. Improvement in your clinical care ability	F2F	4.0**	3.8	3.8	4.0*	4.0*	3.9	4.2***	4.0*
	Online	3.5	3.6	3.6	3.6	3.7	3.6	3.6	3.6

*$p<0.05$; **$p<0.01$; ***$p<0.001$

The subjects' satisfaction scores for each class were further analyzed, and the results are shown in Tables 3 and 4. An asterisk indicates the level of significance for every question in the questionnaire. By closely examining the results for the first, fourth, fifth, and seventh classes of the N1 level in Table 3, the significant differences between the mean satisfaction scores of the two learning groups arose with regard to assessments of the instructor's clinical care abilities, the teaching materials chosen by the instructor, the instructor's ability to guide the students and prompt them to raise questions, the instructor's lecture style, the learning environment, the subject's effort towards learning the course materials, and the improvement in the subjects' clinical care abilities after taking the course. Among these, the lecture style, the effort the subject put into the course and the improvement in clinical care ability showed greater discrepancies between the two groups. However, there were no significant discrepancies between the two learning groups regarding the location of the classes, the scheduling of the classes, and the subjects' interaction with their classmates.

For the N2 level classes, significant differences between the mean satisfaction scores for the two learning groups can be found in all aspects of learning satisfaction (see Table 4). The second class had the lowest discrepancy between the two learning groups, while the seventh showed a discrepancy in all aspects of learning satisfaction. Significant differences between the satisfaction with the lecturers' clinical ability, materials provided, promoting the students to raise questions, lecture style and the improvement in the subjects' clinical care ability were most often seen in N2 level classes.

Five dimensions were considered with regard to things that disrupted learning, namely elements relating to the course material, the instructor, personal factors, the environment, and other factors. A summary of each factor that impacted both learning groups in each level except other factors is shown in Table 5, with the percentages calculated from the questionnaires that the subjects completed (see Appendix 2). This question allowed the subject to choose more than one answer. The sums of times for each factor which was chosen relating to the course material, instructor, personal situation, the environment and other elements are denoted as n_c, n_i, n_p, n_e and n_o, respectively, for total 16 classes, then the total number of disrupting factors is $N=n_c+n_i+n_p+n_e+n_0$. Consequently, the percentage relating

Table 4 Aspects of satisfaction for N2 classes

Questions		Ladder course							
		1st lesson	2nd lesson	3rd lesson	4th lesson	5th lesson	6th lesson	7th lesson	8th lesson
Q1. Instructor's clinical care ability	F2F	4.1	4.1*	4.0*	4.4***	4.2**	4.4***	4.3***	4.2***
	Online	3.7	3.7	3.6	3.6	3.6	3.5	3.4	3.3
Q2. Course material	F2F	4.2**	4.0	4.0*	4.6***	4.0**	4.4***	4.3***	4.2***
	Online	3.6	3.6	3.6	3.5	3.5	3.5	3.4	3.4
Q3. Instructor prompted students to ask questions	F2F	4.2***	4.1**	3.9**	4.3***	3.8**	4.2***	3.8***	4.0***
	Online	3.5	3.5	3.4	3.4	3.4	3.5	3.2	3.3
Q4. Instructor's lecture style overall	F2F	4.3***	3.9	4.0**	4.5***	4.1**	4.3***	4.1***	4.1**
	Online	3.6	3.6	3.4	3.6	3.6	3.5	3.4	3.4
Q5.Location of the class	F2F	3.7	3.9**	3.6	4.0**	3.5	3.8	3.7*	3.7
	Online	3.3	3.3	3.2	3.4	3.4	3.5	3.3	3.4
Q6. The scheduling of class	F2F	3.7	3.7	3.7	4.0*	3.7	3.7	3.7*	3.8*
	Online	3.5	3.5	3.4	3.4	3.4	3.3	3.3	3.3
Q7. Your interaction with classmates	F2F	3.6	3.6	3.7	3.9	3.6	3.9	3.8*	3.8
	Online	3.4	3.4	3.4	3.5	3.5	3.4	3.2	3.4
Q8. Overall learning environment	F2F	3.7	3.7	3.7	3.9	3.6	3.9	3.9**	4.0**
	Online	3.4	3.4	3.4	3.5	3.5	3.4	3.3	3.3
Q9. The effort you have spent	F2F	3.8	3.9*	3.8	4.2***	3.9*	4.2***	3.9*	4.0**
	Online	3.5	3.5	3.4	3.5	3.5	3.5	3.4	3.3
Q10. Improvement in your clinical care ability	F2F	4.3***	4.0*	4.0**	4.4***	4.0***	4.2***	4.0***	4.2***
	Online	3.6	3.6	3.4	3.3	3.3	3.4	3.2	3.3

*$p<0.05$; **$p<0.01$; ***$p<0.001$

to the course material is n_c/N, the percentage relating to the instructor is n_i/N, and so on.

The course material was designed by the instructors in a Power Point format and shown to each class. The subjects in the face-to-face learning group could only listen to the lecture and watch the Power Point presentation, and were not given handouts containing the material. Therefore, they expressed more concern about the course material as a disruptive factor (12.7% and 18.8% for the N1 and N2 levels, respectively). As for the subjects in the e-learning group, they could download and print the course material if they wanted to, and therefore they had less concern about it. However, the e-learning group did complain that the images on the videotape were much too small, and the overall image was blurry, which may have been why some in the N2 level course thought that the course material was a disruptive to their learning (13.3%). For the subjects in the face-to-face learning group, factors such as a dull teaching

Table 5 Factors that disrupted learning

Factors that disrupted learning	Ladder level			
	N1		N2	
	Learning format			
	Face-to-face learning (%)	E-learning learning (%)	Face-to-face learning (%)	E-learning learning (%)
Course material	12.7	9.3	18.8	13.3
Instructor	7.0	3.4	3.3	2.0
Personal factors	31.0	45.4	8.4	50.8
The learning environment	30.0	41.9	18.5	33.9

style, unexciting lecture materials and poor overall instructor quality had negative effects on their learning. As for the subjects in the e-learning group, they felt that the absence of an instructor would easily lead to distraction, and the impossibility of interacting with the instructor also caused learning problems. Except for the face-to-face learning group in the N2 level (8.4%), personal factors were highly cited to disrupt their learning, especially for e-learning group who reported most frequently. The most common personal factor was feeling tired or even falling asleep in class. The learning environment was also a considerable disruptive factor. For the subjects in the face-to-face learning group, significant factors were poor lighting and distractions due to noise from an adjacent room. For the e-learning group, who felt that they were exposed to too many distractions while at home, such as the telephone ringing, family members' interrupting, and the alternative attractions of television and the internet, all of which affected their learning effectiveness. Also, the e-learning group mentioned that because the home environment was so comfortable, it was easy to get too relaxed and then fall asleep.

Discussion

Turner identified the factors that would negatively influence the inclination to participate in on-the-job training (OJT), such as a lack of time, money, or interest in the subject matter [19]. Brooks et al. also pointed out that factors such as distance, location, cost, speaker, time, and networking possibilities might also affect the nursing personnel's willingness to take part in OJT [20]. In earlier work, the researchers suggested that a non-synchronized e-learning model provides an alternative to versatile learning for working nurses, which might eliminate the obstacles of time and space [21].

One hundred and fifty five nursing personnel working at the case hospital who enrolled in the 2007 N1 and N2 ladder courses were invited to participate in this study. The subjects were divided into two groups to take part in either face-to-face or e-learning groups, at their own choice. A follow up interview with the operating room staff confirmed that for many years their staff had been unable to take part in the proficiency ladder program due to their work schedule, staff shortages and heavy workload. The online learning platform thus offered them the opportunity to overcome the existing temporal and spatial constraints and be able to learn in such classes. The same was found for some senior nursing personnel who had more than 11 years' work experience. Moreover, the overall number of participants in the proficiency ladder program was higher than in previous years, due to opportunities offered by the e-learning classes.

Although the subjects in the e-learning group can choose the time and place to learn, some environmental and personal factors, as mentioned in the previous section, significantly affected the subjects' level of satisfaction and was unexpectedly low. A follow up interviewing confirmed some factors that contributed to lower satisfaction with the e-learning format include the subjects' poor computer skills [22–24], the lack of interaction between the trainees and instructor [23], disruptions in the learning environment harming the subjects' ability to concentrate [24]. Other than that, the poor quality of the video such as images were too small or too blurry seemed to be one of the major reasons that caused dissatisfaction.

Conclusions

The results show that the e-learning class was adequate for the nursing personnel to improve their professional abilities. It is suggested for other hospitals to use the e-leaning format of the clinical ladder system to help staff continue to improve their skills in the face of the existing temporal and spatial constraints. Meanwhile, large-scale hospitals can initiate an educational alliance to exchange education resources available at each hospital.

Before the results of this study can be applied, a few limitations should be noted. Firstly, this research was conducted as a cross-section study, and thus dynamic changes in the learners' results or satisfaction levels could not be revealed. In other words, a longitudinal study should be undertaken to provide more information. In addition, the responses to the questionnaire were self-reported, so the learners may have exaggerated their feelings and thus biased the results. Moreover, the subjects of this study were selected from the group of staff who enrolled in the nursing care proficiency ladder N1 and N2 courses, while the N3 and N4 courses were not included in this work. Finally, the e-learning classes in this study were developed by uploading the videos of the face-to-face classes which were not of professional quality, and this undoubtedly affected the satisfaction of the on-line learners. Professional e-learning instructors with online content and instructional strategies could definitely help in increasing the satisfaction of the on-line learners and should be considered in future research.

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Appendix 1

Table 6 2007 Clinical ladder courses for levels N1 and N2

Course no.	Topic
N1-1	Introduction to common endocrine disease
N1-2	Nursing ethics and nurse patient relations
N1-3	Nursing and legal ethics
N1-4	Patient safety—accident prevention and management
N1-5	Seminar
N1-6	Hygiene assessment and management
N1-7	Introduction to nursing records (SOAP)
N1-8	Database usage and introduction to the 5th edition of APA
N2-1	The Management of electrolytes imbalance and the clinical assessment of ABG
N2-2	The assessment of chest x-rays
N2-3	Legal ramifications and crisis management.
N2-4	Nursing quality control
N2-5	The design of nursing group education.
N2-6	Writing and assessment of case reports.
N2-7	Patient care of the radiation oncology
N2-8	The assessment of patient consciousness level

Appendix 2

Table 7 Questionnaire for learning

Please evaluate the course by providing your answers to the questions below. Your answers will be taken into consideration in the improvement of the course. Thank you for taking the time to complete this questionnaire!	Course title:					
	Very unsatisfied	Unsatisfied	Neutral	Satisfied	Very satisfied	No comment
1. How do you feel about the instructor's clinical care ability?	□	□	□	□	□	□
2. How do you feel about the course material provided by the instructor?	□	□	□	□	□	□
3. How do you feel about the instructor's ability to guide the students in their thought process and prompt them to raise questions?	□	□	□	□	□	□
4. How do you feel about the instructor's overall lecture style?	□	□	□	□	□	□
5. How do you feel about the location of the classroom?	□	□	□	□	□	□
6. How do you feel about the scheduling of lessons?	□	□	□	□	□	□
7. How do you feel about your interaction with classmates?	□	□	□	□	□	□
8. How do you feel about the overall learning environment?	□	□	□	□	□	□
9. How do you feel about the effort you have spent?	□	□	□	□	□	□
10. How do you feel about the improvement in your clinical care ability after completing the course?	□	□	□	□	□	□
11. Factors that disrupted learning: (please specify the factor(s) if you have selected "Other")	□ Course material □ Instructor □ Personal factors □ The learning environment □ Other _____					
12. Suggestions for the course:						

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