Development of blended learning model integrated nursing leadership training using web-based in Indonesia

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Abstract:

BACKGROUND: Nurse managers are the frontline leaders in the ward that directly impact the quality of care services. Many nurse managers in Indonesia were inadequately prepared to fulfill this role, especially during this crisis. The objective was to develop blended learning an Integrated Nursing Leadership Training (INLeT) using web based and test the effectiveness.

MATERIALS AND METHODS: This research is a research development using modified Borg and Gall by researcher, namely, Planning, Redesign, Intervention, Modify, and Evaluation. The INLET model was validated by nine experts in health and media technology design. Data were tested using quasi-experiment research in Sanglah General Hospital and Wangaya Public Hospital in Bali.

RESULTS: The results of analysis of the content validity of all items valued V index 0.96 (high category) from design experts and V Index 0.92 (high category from health experts. The experiment group obtained N Gain scored 0.5603 at medium level, and the control group result of N Gain Score was 0.2845 in the low-level category. Using t-test, both the experiment and control group showed significant improvement of score test with $P = 0.000$ ($P < 0.005$). Bivariate analysis using independent t-test result $P = 0.000$ ($P < 0.005$) means significant difference score test compared between experiment and control group.

CONCLUSIONS: Using the web, this blended learning INLeT Model is effectively applied for nurse manager professional development; therefore, this study can prepare nurse managers into a leadership role by integrating moodle web-based into nursing training.

Keywords:
E-learning, moodle, nursing leadership, web based

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Introduction

Nursing leadership encounter challenges after emerging of pandemic COVID 19 crisis; therefore, it is essential to make nursing leadership moving forward, more visible in decision making in multidisciplinary and interprofessional collaboration, and also effective at strategic level.[1] Nurse managers need to be supported and mentoring to implement changes, maintaining infection control prevention strategies, and ensuring adequate staff and resources for 24 h at ward level. Study has found nurse managers challenges including a lack of orientation program for nurse manager,[2] lack of adequate training to support them to work effectively;[3] nurse manager orientation program is lack of structured program to provide experiences that helps them gain competencies to be successful leaders that assure power and status in health-care organization.[4] Therefore, it is essential to create formal planning to develop readiness nurse manager to ensure they prepared to fulfill leadership roles.[4-6] Nursing leadership development program is well established in many countries such

as The AACN, AONE, and AORN initiated the Nurse Manager Learning Partnership that developed the NM competencies in the United States.[7] In Canada, DWHLI (The Dorothy Wylie Health Leaders Institute) focused on leadership principles, models, behaviors, skills, and tools also stimulate experiential learning that will help existing and emerging.[8] Similarly, in th UK, the Royal College of Nursing introduced a Clinical Leadership Programme in 1994 to support clinical nurse leaders to improve patient care that run over 12 months and applying experiential learning to develop transformational leadership behavior.[9] Take the lead program initiated by New South Wales Department showed Australian committed to develop nursing leadership to ensure nurse manager able to manage change and complex care.[10,11] However, Indonesia nursing leadership program is not well established, there is little evidence to support model of nursing leadership training particular for nurse manager.

Learning is foundation of leadership. Developing nursing leadership training using web is new issue for many hospital trainings. In digital technology, leadership defines as a new way to recognize leadership is process of developing a knowledge network and create connection enable to inspire other.[12] Web-based learning in leadership is applying connectivism principles where individuals able to from personal leadership through self-direct their own leadership goals, networking, communication, and consultation with others. According to the previous research, effect of web-based learning modules for public health nurse significantly improve their knowledge and competency in program planning;[13] web-based learning program in Korean triage system results higher learning satisfaction for nurses in emergency.[14] Former studies showed the development of web based for clinical teaching beneficial for nurses to understand real situation in clinical practice.[15,16] Therefore, development of integrated nursing leadership training (INLeT) for nurse manager using web-based learning is essential to enhance student-centered learning, self-directed learning, accessibility during pandemic COVID-19, as nurse manager under constant pressure to manage ward and their staff.

Sanglah General Hospital in Bali was one of type A tertiary teaching hospitals, one of the centers for COVID-19 referral patients. As one of magnet hospital for eastern part of Indonesia including Timor Leste, number of nurses employed in 2020 was 1013 nurses and 130 midwives. This number still projected will be increased due to increased pressure for hospital during COVID-19 crisis. Nursing training was changed through the time,[17] from face to face into online and blended methods. This is because to reduce the risk

of getting COVID-19 infection exposure among staff while following training session. Hospital equipped internet access through intranet to facilitate not only for patient care services such as electronic medical record but also for learning facilities (*e-learning*). Therefore, there is important to develop online nursing training that provide professional development model for nurse manager that allows for flexibility and independent in learning to enhance their learning needs and competency.

Therefore, this study aimed to develop an INLeT model using web-based for nurse managers. There were two primary objectives of these studies: developing a procedural model INLeT using web-based and validating and testing the effectiveness INLeT model for nurse managers.

Materials and Methods

Study design and setting

A researcher developed own procedural Model Planning, Redesign, Intervention, Modify, and Evaluation (PRIME) consist of Planning Re-design, Intervention, Modify, and Evaluation for this study by modifying Borg and Gall research process.[18] Ten step research process including (1) training need assessment; (2) re-design consist of develop Model INLeT; (3) formulate conceptual INLeT Model; (4) develop procedural model; (5) develop operational procedure; (6) develop prototype; (7) develop training material; (8) Conduct testing; (9) revise model; and (10) end user/final model.

This study used Moodle (Modular Object Oriented Dynamic Learning Environment) which is an open sources course management system or learning management system based on the philosophy of education and has a large community and share and are incorporated into an organization. Moreover, it is a robust collection of learner-centered tools and collaborative learning environments that enables both teaching and learning. It is a web-based platform with a mobile-friendly interface that enables it to be accessed from anywhere in the world using a variety of different web browsers or devices.[19,20]

This web nurse training can be accesses through Nursing Resource and Learning Centre (NRLC). NRLC was designed to provide dynamic learning experience for nurses and midwives to foster continuing professional development at Sanglah Hospital Bali. The web front page and website diagram of were depicted in Figure 1.

As shown on Figure 2, admin will control facilitator and participant. Admin has authority to block and delete the account if there is a fraud or conflict. Facilitator provides learning material such as video, PowerPoint, book,

and journal. Then, participant can access it after join the course. Course use comprehensive learning system including video, online meeting, individual and group assignment, blog, and discussion on the forum or chat. In addition, user can login as a guest to check any course, schedule, and learning system before joining.

Figure 3 displays the first screen after login. Several courses can choose before start the course. Then, those are several modules to finish in the limited time with schedule in every course [Figure 4]. The features in every module including download learning materials, watching course video, comment, and review for each module. Chat feature can help discussing with the teacher privately or group.

On the dashboard [Figure 5], the user can edit their profile, set up the preferences, check the messages,
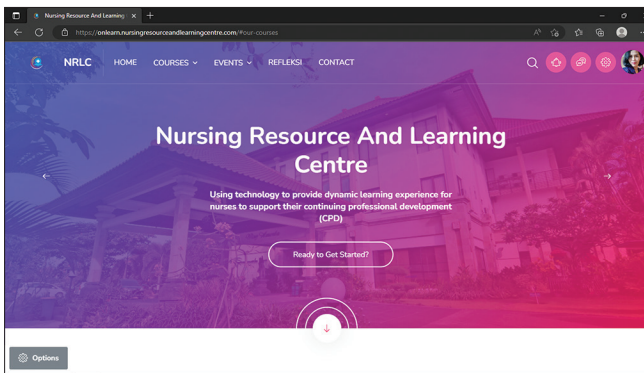

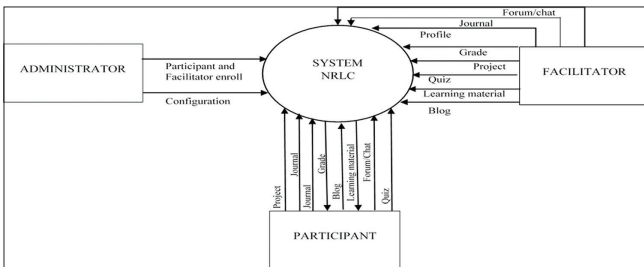**Figure 1:** Front page of nursing resource and learning centre web

Figure 2: Diagram Nursing Resource and Learning Centre website

grade, and last activity. Blog was created as reflection provides course participants to upload their reflective practice writing form their experience in the nursing. Reflective practice is also a chance that nurses can share their stories into the web to express their feelings but also enable them to learn each other. In every module, there was also a forum for discussion with all of the users, those are facilitators, participants, and guests. Any problems that appear can directly contact the admin on the menu contact.

Website provided access for nurse to do self-study. As adult learner, this is also provide flexibility of learning, they can access it for 24 h using personal computer and their mobile phones. INLeT model was conducted blended, off line in the class room in the beginning of training session and at the end of training session. On line face-to-face conducted using zoom meeting accordance with training schedule. Nurse managers were thought about reflective writing, and they need to up load their reflective practice in the web and assigned to develop an innovation project at the end of the course. Teacher of this training recruited from university lecture and from nursing hospital leaders.

Study participants and sampling

Field testing was conducted by 66 nurse managers from two hospital units. Participants had to meet the following requirements in order to be considered: nursing observers/supervisors with at least 1 year of experience, willingness to complete the program's training requirements, and computer proficiency. However, the respondents were excluded when they could not attend until the training program was complete due to the absence of the room's head and supervisor due to illness or leave.

Data collection tool and technique

Five self-administered questionnaires were used in this study. The study measured five aspects of leadership included critical thinking, collaboration, communication, creativity, and caring on hospital
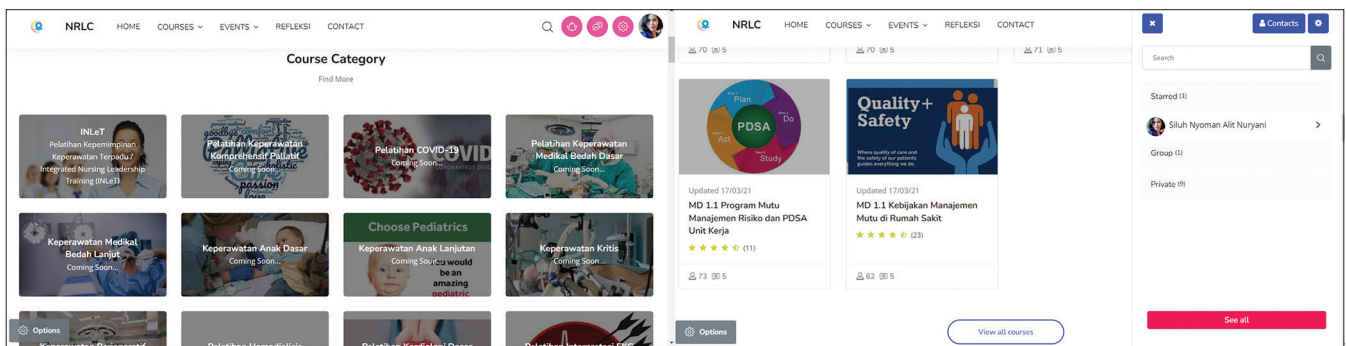

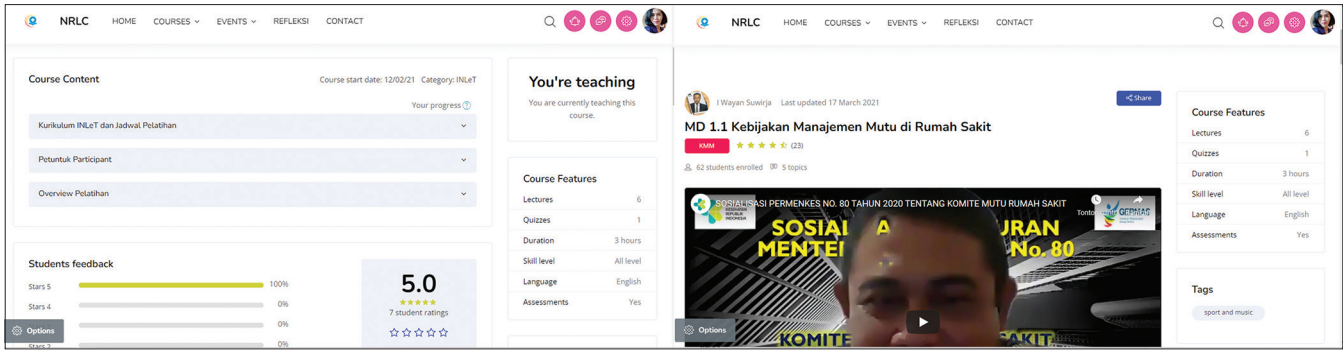**Figure 3:** Course content and chat access
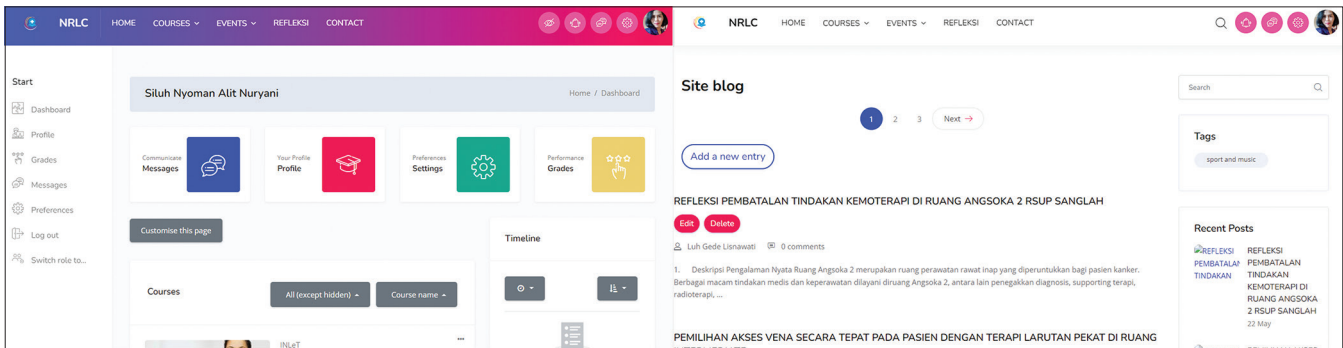
Figure 4: Course class content

Figure 5: Profile users content and blog

nurse managers. Critical thinking was measured with Nurse Critical Thinking Skill[21] that was developed by the Nursing Executive Center. Interpersonal Communication Competence Scale[22] was used to measure communication. Collaboration was measured by Nurse–Nurse Collaboration Scale.[23] Then, Runco Ideational Behavior Scale[24] was used to measure creative ideation. Last, Caring Behaviors Inventory-24[25] was used for measuring caring.

Ethical consideration

This research was guided by World Health Organization[26] about ethical standards during pandemic. Google Forms were used by researchers to obtain informed consent from study participants before beginning the research Detailed information on the study's objectives and methods can be found on each of the several forms. After reading the form's content, participants were requested to pick the "Agree" option in the area provided to indicate their willingness to participate in this study. Those who participated were told that their data would be kept private by the researchers.

Results

Content validity

The content validity in this study was determined by expert judgments. Analysis of the validity of the content using the formula Aiken's V. The item is valid

according to the CVR is the item with the value results of the analysis is ≥ 0.8. The data obtained from panel of nine experts. Nine experts consist of three experts in online educational design (V1, V2, and V3), six experts who had high experience in healthcare consist of one medical lectures and five nursing leadership (V4, V5, V6, V7, V8, and V9). The research instrument used in the form assessment sheets that contain two scale only. Based on the design, experts obtained validity with overall index of 0.96 for V index. This value indicates that the content validity of the instruments is in the high category. Next, from six health-care experts obtained validity with overall index of 0.92 for V index which means also high category.

Testing

A total of 66 nurse managers were participated in this research, 33 participants in experimental group and 33 participants in control group were included in the final analysis. The data collected in this study are quantitative data. Quantitative data were obtained from pre-post-test using objective test number with 25 questions to evaluate any improvement of knowledge. Data were analyzed using gain value (g). N-gain level of criteria for including high (g) ≥ 0.70, medium $(0.3 \leq g < 0.7)$, and Low $g < 0.3$. Results of N-gain scored between experiment and control group were shown in Table 1.

It can be seen from the table that INLeT model of training

Table 1: Descriptive statistic of N gain score

	Experiment group				Control group			
	Pretest	Posttest	*P*	N gain	Pretest	Posttest	*P*	N gain
Mean	14.36	20.21	0.000	0.5603	16.36	19.21	0.000	0.2845
SD	1.917	2.118			2.935	2.147		

SD=Standard deviation

had improved learning outcome among experiment group with N gain 0.5603 this category at medium level. The control group obtained N Gain 0.2845 in low level of category. Using dependent *t*-test, both experiment and control groups had significant improvement of score test with $P = 0.000$ ($P < 0.05$). Bivariate analysis using independent *t*-test to obtain $P = 0.000$ ($P < 0.05$), means there was significant impact of knowledge using web among experiment than control group were shown in Table 2.

Discussion

Nurse manager at the front line required to have leadership competency to be able to lead self, patient, and their staff. This INLeT program was first introduced using web-based education, namely, nursing resources and learning center/NLRC was first designed to improve learning outcome among nurses in hospital. This study result showed that INLeT model using web-based education for nurse manager was more effective than only on line training. These findings due to web-based education had provided nurse manager an easy access to educational material not only through their mobile phone but also form their own personal computer at any time and any place. These findings relevant to previous study that applying web-based technology into nursing education in clinical pedagogy and teaching competency provide platform in flexible way and with rich resources material enable nurses for continuing education.[15,27] Study involved nursing leadership in 41 countries in America using e-learning showed improvements pretest and posttest among training participants.[28] This supported by findings from systematic review[29] showed that trends of health leadership using digital education though still rare though abundant of potential benefit from e-learning compared to traditional method including enabling busy clinicians accessible materials, relevant, engaging, and supporting collaboration. This study applied e-learning service model that enable learners to combine face-to-face component by on line and real life experiences in the clinical practice. Similar study using e-service learning model in math students has found on line provided positive experiences including social skills which allows learners to have discussion with their peers and supervisor anytime and everywhere. It also provides learners more understanding of concepts.[30]

Table 2: Bivariate analysis using independent *t*-test

Group	*n*	Mean	Mean difference	*P*
Experiment	33	5.85	3.09	0.000
Control	33	2.76		

Web-based nursing education in Indonesia still rare, this study is the first nursing training program using web based for nurse managers. This study found some barriers including most of nurse managers who participated in this study are baby boomers or digital immigrants most of them are lack of internet skills. As on line training were mandatory in hospital they were learn to use zoom meeting as regular patient meeting in the hospital. Web-based training is a new technology, many of participants find difficulties to use this web to help them in learning. Most of them encounter barriers including a lack of time to read all material in the web, watching video. Similarly, study has found that, using technology encounter some challenges among baby boomer or digital immigrants, most of them stated that on line learning is hard due to lack of ICT skill, problems with internet connection, and time management.[31] Although nurse manager are digital immigrants most of them are keen to learn and researcher provided them training of how to use web and learning application. Furthermore, this INLeT model was developed for hospital. It offered e-learning to support continuing education model for nursing in hospital.[32]

Systematic review showed that key component of nurse manager development were curriculum, method of delivery, support, and funding, study that involved didactic learning, interactive learning, experiential learning and reflective learning was found successfully for nurse manager.[33,34] The INLeT model method of delivery using integrated method including online learning, face to face, leadership practice in the ward to develop an innovation project as group project, group discussion, and writing reflective practice. Moreover, Moodle has a user friendly interface that helpful for the user to use it.[35,36] Although, Module and Video content in the web were not made by researcher but using references from many resources. Most participants were satisfied with INLeT model. Future studies need to develop validated curriculum and module and learning materials that going to be used in the web. There also need to evaluate the effectiveness of INLeT model for NUM had impact on staff and patient outcome.

No one knows when will be pandemic will end,[37] yet traditional teaching face-to-face method in future will be change into web-based training around the world. Health-care workers need to updating their knowledge without being anxious of many barriers such as lack of time, being close contact each other, and fostering independent study.

Limitation and recommendation

The limitation of the study is training was limited to one type of training during the test and the number of participants was small. Further study should try with a bigger number of participants to check the stabilization of the web. Moreover, it needs to be confirmed can be well worked when running two or three training in a similar time.

Conclusions

This INLeT model of nursing leadership training for nurse managers was developed using the PRIME model modified from Borg and Gall's research and development method. The NRLC website has three main roles, namely, administrator, facilitator, and user/participant. Admin is the center of the website for controlling any activity in the system. The facilitator will provide the material for study including a journal, video, book, and powerpoint. The participant can access the material after registering for the course.

Every module's features include downloading learning materials, watching course videos, comments, and reviews for each module. The chat feature can help to discuss with the teacher privately or group. The user can edit their profile, set up the preferences, check the messages, grades, and last activity. INLeT provides a Blog to course participants to upload their reflective practice experience.

This model has been validated by nine experts and tested both into experiment and control groups of nurse managers, resulting in significant improvement of knowledge in pretest and posttest scores. The development of a blended learning model of INLeT using web-based education for nursing can foster independent learning for busy clinicians and facilitate other various training required by nursing in hospital.

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Conflicts of interest

There are no conflicts of interest.

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