

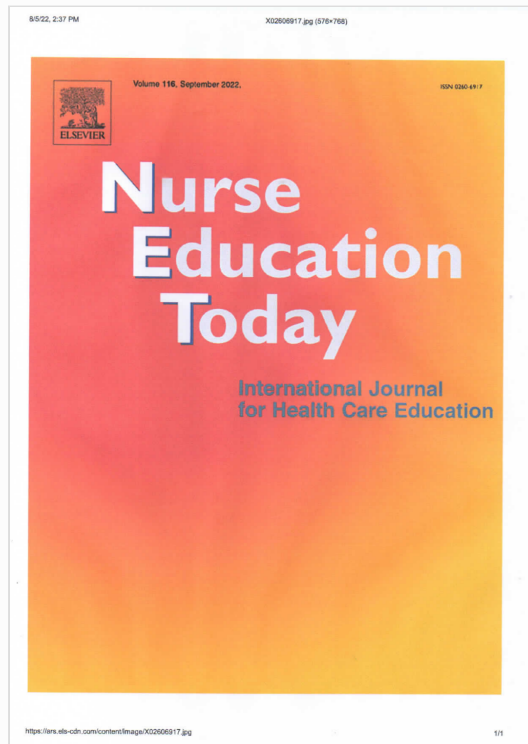


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Development and evaluation of a preparation model for the Indonesian nursing licensure examination: A participatory action research

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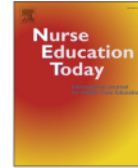
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Development and evaluation of a preparation model for the Indonesian nursing licensure examination: A participatory action research

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ABSTRACT

Background: The long-standing underachievement in the Indonesian national nursing competency examination (NNCE) has been a common concern, and there is limited information on the preparation program for this licensure examination.

Objective: To develop an NNCE preparation program model and evaluate its effectiveness in increasing competency among nursing graduates.

Design: A quasi-experimental study using participatory action research (PAR).

Setting: Faculty of nursing of a full-boarding private university in Indonesia.

Participants: The participants were selected with the purposive sampling method. The 23 course coordinators and clinical instructors met the inclusion criteria of having worked for at least five years as classroom teachers and at least one year as course coordinators or clinical instructors. The 85 nursing graduates met the inclusion criteria of having finished the internship program and planned to take the NNCE.

Methods: The model was developed using PAR and the evaluation done to measure the increase in the competency level and the level of perceived readiness and satisfaction of both the participant educators and nursing graduates.

Results: The proposed model consists of core components and essential concepts. The core components are a holistic preparation process, active involvement and participation, knowledge and skill specialty, sharp examination-taking and skills, motivation to join the program and self-confidence to pass the NNCE, and time commitment for the preparation program. The essential concepts consist of awareness and trust, desire to change, sense of responsibility, mutual collaboration, equipped and empowered to act, definite direction and goals, mentoring. The model's evaluation indicated a significant increase in competency level, overall perceived readiness for the national nursing competency examination, and degree of satisfaction with the preparation program.

Conclusions: The implementation of the preparation model effectively increased the nursing graduates' competency level, and both the participating educators and nursing graduates were satisfied with its effectiveness.

1. Introduction

Improvement in readiness and score achievement among nursing students and graduates for the licensure examination is of great interest among academics. Efforts are exerted to achieve the improvement through proper preparation programs because preparation processes are fundamental to the nursing students' success rate taking the licensure examination (Odom-Maryon et al., 2018).

There are two streams of nursing education programs in Indonesia i.e., a three-year diploma program and a four-year baccalaureate nursing

education followed by a one-year internship program. The graduates of each stream must take licensure examination, the national nursing competence examination (NNCE), centrally administered through a computer-based testing system administered by the government in the Indonesian language. The NNCE for the baccalaureate nursing program being studied in this research covers nine nursing subjects, i.e., fundamentals of nursing profession, medical-surgical nursing, pediatrics nursing, maternity nursing, psychiatric nursing, management, emergency nursing, geriatric nursing, community and family nursing. It is also mandatory for foreign nurses if the Indonesian government does not

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recognize the license from the original country.

In this study pass rate is defined as the percentage of NNCE takers that pass this licensure examination. The term institutional pass rate for each educational institution, or national pass rate for the whole country. There is a general dissatisfaction with the scores achieved in the national NNCE pass rates, which has an average of less than 60% since its implementation in 2013 (Arifin, 2018). The management and educators of the participating faculty of nursing also shared common dissatisfaction. In addition, there is limited information on the preparation program provided for the nursing graduates (NGs) to achieve higher scores in this licensure examination (Gardulf et al., 2016). Therefore, there is a need for a preparation model designed and built to improve the NGs' NNCE score.

Knowles' theory of adult learning (Andragogy) was used in this study as the guide in establishing the learning conditions for the development and evaluation of the preparation model. The andragogy comprises the understanding and support of lifelong learning in adult learners based on six assumptions, i.e., the need to know, the learners' self-concept, the role of the learners' experiences, readiness to learn, orientation to learning, and motivation (Knowles et al., 2015).

Bloom's classification of competency was also used in this study because it was believed to be a critical factor in developing educational activities' objectives (Knowles et al., 2015; Merriam and Grenier, 2019). It is used as the foundation for the writing test questions for the NNCE (Ministry of Research, Technology, and Higher Education, 2017).

This study used participatory action research (PAR) as its method because it focuses on enabling action and empowerment (Chevalier and Buckles, 2019; Groot et al., 2019) through reflective cycles, where participants collect and analyze data, then determine what action should follow. The study aims to develop and evaluate a proposed preparation program in three phases: Planning, implementation, and evaluation. Table 1 shows the details of the typical activities done in each of the two PAR cycles done in this study.

This study's research questions are: (1) Can the proposed preparation program improve the NGs' evaluation examination scores? (2) Are the educators and NGs that joined the study satisfied with the implementation of the preparation model? (3) What are some of the essential concepts that would emerge from the planning, implementation, and evaluation of the preparation model as success indicators?

2. Methods

2.1. Design

A quasi-experimental study with a triangulation approach to data collection using both qualitative and quantitative methods. The first stage, done in the previous study (Hutapea et al., 2021), identified the perceived components of an effective preparation program model that would enhance the evaluation examination score, thus, improve the institutional NNCE pass rate. In this paper, the second stage is the preparation model's development, implementation, and evaluation, which occurred in April – September 2018.

2.2. Research setting and ethical consideration

The study was carried out at the faculty of nursing of a private full-board university in Indonesia. The Center for Social and Behavioral Sciences Institutional Review Board (No. 2018 Nst – Qn 015) of Prince of Songkla University approved this study's ethical clearance. All of the participants were well informed about the study's purpose and procedures. All signed informed consent and had the right to withdraw from the study any time they wish.

2.3. Participants

The participants, selected with the purposive sampling method,

Table 1

Summary of the activities of PAR cycles 1 and 2 of the study.

Steps	Activities	Cycle	
		1	2
Reconnaissance	<ul style="list-style-type: none"> Finding components of an effective preparation model to prepare NGs to achieve a higher competency level in the national nursing competence examination (done in the previous study). 	–	–
1. Reflecting	<ul style="list-style-type: none"> Creating awareness among educators on the existing conditions through orientation seminar. 	✓	–
	<ul style="list-style-type: none"> Creating awareness among NGs on the existing conditions through orientation seminar. 	✓	✓
	<ul style="list-style-type: none"> Presenting findings of the previous stage of the study on the perceived components of an effective preparation program for NGs. 	✓	–
	<ul style="list-style-type: none"> Developing the preparation model by selected participants. 	✓	–
2. Planning	<ul style="list-style-type: none"> Planning for the details of the implementation processes of the core components of the preparation model. 	✓	–
	<ul style="list-style-type: none"> Assigning task details to the educators for the program implementation. 	✓	–
	<ul style="list-style-type: none"> Formulating weekly topics and schedules and evaluation methods. 	✓	–
	<ul style="list-style-type: none"> Orienting educators and graduate nurses on the preparation programs. 	✓	–
	<ul style="list-style-type: none"> Empowering educators on participatory action research, Knowles' theory, and Bloom's taxonomy of competency, test item development skills, and holistic approach to preparation for the national nursing competence examination. 	✓	–
	<ul style="list-style-type: none"> The target of each clinical subject to be achieved at the end of the cycle: exam scores, attendance, and timeliness. 	✓	–
3. Implementing	<ul style="list-style-type: none"> Collecting pre-test scores and levels of satisfaction of NGs. 	✓	✓
	<ul style="list-style-type: none"> Implementing the tentative preparation model with all the planned details of activities that have been formulated in the planning step. 	✓	✓
	<ul style="list-style-type: none"> The preparation program was made a requirement for NGs. 	–	✓
	<ul style="list-style-type: none"> Use of the government-issued "Siners" book as a guideline for the review sessions. 	–	✓
	<ul style="list-style-type: none"> Build test bank on validated questions for all of the clinical subjects to be tested in the national nursing competence examination. 	–	✓
	<ul style="list-style-type: none"> Supervision by the course coordinator over case-study and critical thinking sessions. 	–	✓
4. Observing	<ul style="list-style-type: none"> Involvement of clinical instructors and classroom teachers in the individual independent study sessions. 	–	✓
	<ul style="list-style-type: none"> Observing the quality indicators of the implementation of the model. 	✓	✓
	<ul style="list-style-type: none"> Taking notes on the teaching and learning processes during the implementation process. 	✓	✓
	<ul style="list-style-type: none"> Regular bi-weekly program evaluation meeting. 	✓	✓
5. Evaluating and reflecting	<ul style="list-style-type: none"> Evaluation of pre- and post-test examination scores and level of satisfaction of NGs. 	✓	✓
	<ul style="list-style-type: none"> Evaluation of the planning and implementation processes of the model. 	✓	✓
	<ul style="list-style-type: none"> Reflecting on observations and outcomes of the daily preparation program activities. 	✓	✓
	<ul style="list-style-type: none"> The decision to stop the cycle or further improve, plan, implement, evaluate, and replan. 	✓	✓
6. Replanning			

Legend: (✓) Activities done and (–) not done in cycles 1 and 2.

consisted of educators, i.e., course coordinators (CCs) and clinical instructors (CIs), and nursing graduates (NGs). The size of the sample was not pre-determined prior to the selection of the participants. The educators were invited to an orientation seminar on the study and were asked to fill out a questionnaire on the demographic data and the

inclusion criteria, and those that agreed to join were requested to sign an informed consent form.

As key participants, the selected educators met these inclusion criteria: 1) has worked as a classroom teacher for at least five years and as clinical instructors and course coordinators for at least one year, 2) dissatisfied over the institutional NNCE pass rate, and 3) desires to help improve the situation, and 4) willing to participate actively throughout the study. Only individuals who explicitly expressed dissatisfaction and desire to help were included in the study, assuming that they would be more motivated and committed to staying on throughout the study.

An invitation letter was sent to the students that have just finished their nursing internship program in the faculty to join the study, and those interested were invited to join an orientation seminar on the program.

2.4. Instruments

A model can be evaluated for its validity, clarity, applicability, and effectiveness using internal tools (Newcomer et al., 2015) external tools (O'Lynn, 2017; Opsahl and Horton-Deutsch, 2019). This study's internal evaluation tools included standardized examinations, valid questionnaires, research descriptive observational notes, and the minutes of meetings. The external evaluation tool used was the NNCE nation-wide try-out program, conducted by the government to assess the applicants' level of readiness for the NNCE about one month before taking the real NNCE. The results of the try-out are reported as scores achieved for each clinical subject. The external tool was used to add an additional layer of credibility to the model by reducing any potential biases that may be present in the development process (Tashakkori and Teddlie, 2010).

2.4.1. Pre- and post-test evaluation of score achievement and satisfaction levels

The standardized pre-test and post-test examinations used to measure the NGs' achievement resembled the real NNCE. They consisted of 180 multiple-choice questions identical with the NNCE, with internal consistency ranging from 0.773 to 0.786, and an overall Kr 20 value of 0.779.

The pre-test and post-test questionnaire was used to gauge the NGs' satisfaction on the existing condition of preparation activities for the NNCE and the implementation of the preparation model (Table 3), administered right before and after joining the preparation program. It was checked by a panel of experts and had internal consistency with Cronbach's alpha value of 0.878.

2.4.2. Descriptive observational note

The researchers took descriptive observational notes to record the data on the events, conversations, and the contexts within which they occurred, notes of meeting activities, and made reflective notes that documented the researchers' personal experiences, reflections, and progress throughout the research.

2.4.3. Informal semi-structured interview guide

An informal semi-structured interview was done among the participant educators guided by the following open-ended questions: 1) What are your over-all reflections on the program processes and activities, 2) What are your suggestions to improve the program?

2.5. Research processes

2.5.1. Development of a preparation model

In general, according to Basol et al. (2015) and Newcomer et al. (2015), the steps in developing an evidence-based model consist of (1) identifying and refining the substance area, (2) convening and running model development groups, (3) assessment of the evidence base, (4) translating evidence into a model, and (5) external evaluation of the model. The first three steps were conducted in the previous study

(Hutapea et al., 2021), and the last two steps were done in the PAR process of this study.

2.5.2. PAR process

The key participants unanimously agreed to use Wadsworth's (1997) action evaluation research process in the PAR cycle involving six steps elaborated below. Summary of the activities and additional description of the activities is presented in Table 1.

First step, after reflecting on the empirical data gathered in the previous stage of the study, the key participants consisting primarily of the CCs, adopted the three groups of components in developing a preparation model: 1) Holistic approach to the preparation process (policy) in the institution group, 2) active involvement and participation, knowledge and skill specialty in the educator group, 3) sharp examination-taking strategy and skills, motivation to join the preparation program and self-confidence to pass the NNCE, time commitment to join the preparation program, in the NG group. The intensive preparation model was then implemented in the second step.

Second step. It was agreed that each cycle is implemented five days a week for two months, each week devoted to focusing on one clinical subject. The first and second steps of cycle 1 lasted for one month. Cycle one activities were not repeated in cycle two, except for the orientation to create awareness of the existing condition among the NGs.

Third step. The model was implemented in two PAR cycles, each lasted for two months, with a typical daily Monday-to-Friday program conducted from 8 am to 5 pm. Each day started with an empowerment session for one hour followed by subject review and discussion for two hours, lunch break for two hours, case study and critical thinking for two hours, and another two hours for an independent study session. The daily empowerment session covered different topics for each domain of life, i.e., spiritual, mental, physical, social, and emotional. Computer-skill enhancement was done one hour every Thursday, with time allotment deducted from the independent study's two-hour time allotment. Each week the subject review and case study session focused on one clinical subject in the following sequence: medical-surgical, critical care, maternity, pediatrics, management, community and family, psychiatric, geriatric.

Fourth step, i.e., observing, during the implementation, quantitative and qualitative data were collected, and bi-weekly meetings were held for periodic evaluation of the implementation processes. In the fifth step of the cycle, reflecting on the outcomes of the implementation was done. The questionnaires and examinations' quantitative data and the qualitative data of the observations and informal semi-structured interviews were analyzed, summarized, and then presented in the group meeting discussion sessions. Decisions were then made in the sixth step of the cycle on the replanning, what improvements needed to be done in the next cycle's implementation to develop the model further or stop the cycle if the participants were fully satisfied with the outcome of the implementation.

2.5.3. Data collection

In collecting the quantitative data, the pre-test and post-test examinations were carried out in manners that mimic the real NNCE. The room temperature, method (computer-based), timing, proctoring system, dress code, and other relevant factors were ensured to follow the government regulation. The evaluation questionnaire was administered before and after each examination. The results of the examinations and questionnaires were coded to maintain the anonymity of the participants. The scores achieved by the NGs in the nation-wide NNCE try-out were collected from the faculty of nursing as the recipient of the report of the results.

Kim et al. (2017) and Neergaard et al. (2009) indicated that the descriptive qualitative research method is preferable when a straight description of a phenomenon is desired from informants regarding a poorly understood phenomenon needed to refine interventions. The researchers collected the qualitative data from the participant educators

through informal semi-structured individual interviews for 35–45 min in private settings guided by an interview guide and through the descriptive observational notes taken throughout the research. Members of the research team collaborated in acquiring consistent patterns of the meaning of the text then shared the data with all of the participants for reconfirmation and correction to achieve a consensus decision in group meetings during the reflection stage of each PAR cycle. The researchers met periodically to make conclusive themes. In keeping the interviewee's privacy, the audio-taped interviews were coded and destroyed at the end of the study. The identity of the interviewees was not revealed during the discussion in the group meetings.

2.6. Data analysis

Descriptive statistics were applied to the socio-demographic data of

the educators and NGs using statistical software. The normal distribution was tested using the Shapiro-Wilk test. A suitable statistical test was used to compare the mean values of various factors of the level of satisfaction and the scores achieved from the pre-test and post-test examinations with a level of significance of $p < .05$.

This study used thematic analysis to analyze the qualitative data to find repeated meanings across, a crucial step in interpreting phenomena (Vaismoradi et al., 2013) and to extract essential concepts. The analysis was done in six steps based upon Braun and Clarke's (2021) approach to thematic analysis: Familiarization, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report.

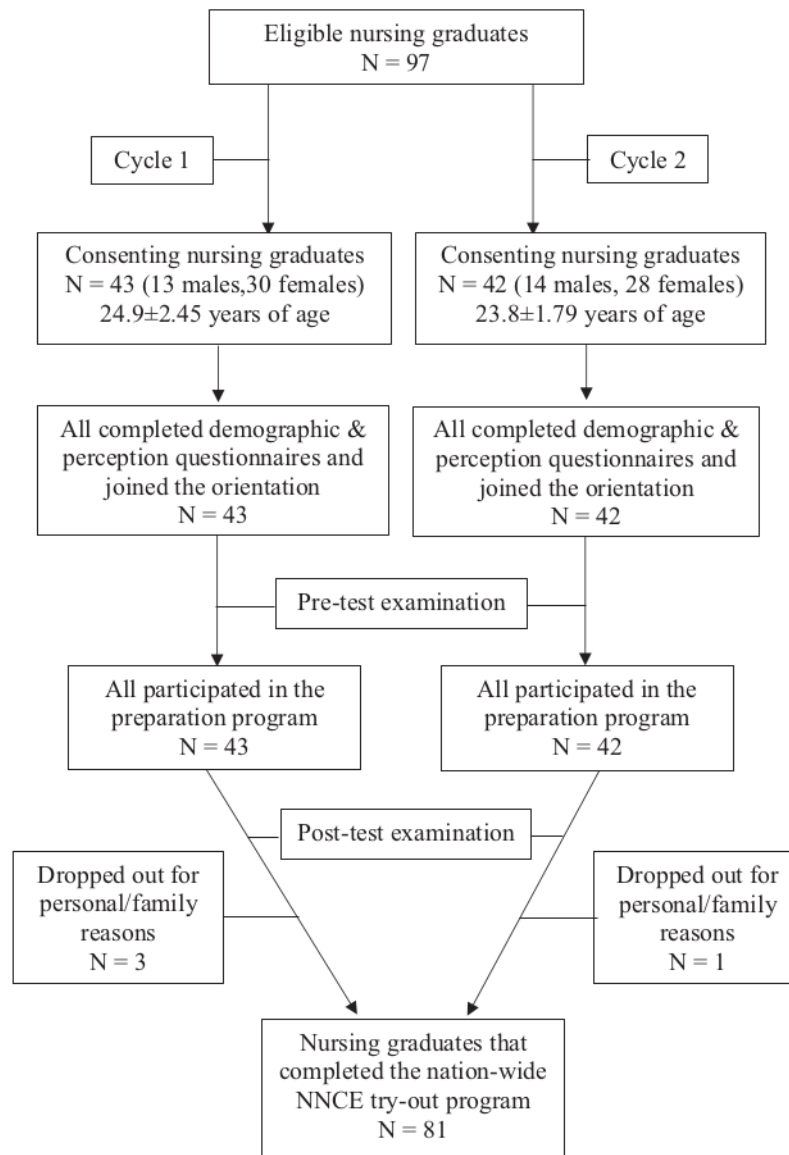


Fig. 1. The flow of participant nursing graduates through each stage of the study.

3. Results

3.1. Participants

There were nine CCs, 47.1 ± 7.57 years of age, two males, seven females with 15.7 ± 10.40 years working experience as a classroom teacher (CT) and 6.9 ± 5.99 years as CC, 14 CIs, 38.8 ± 8.29 years of age, three males, 11 females with 12.1 ± 6.77 years working experience as CT and 5.9 ± 4.39 years as CI. All educators participated actively in both PAR cycles.

Out of 97 eligible NGs who had finished the internship programs and planned to take the NNCE, 43 NGs, 24.9 ± 2.45 years of age, 13 males, 30 females that consented to participate in cycle one and a different group of 42 NGs, 23.8 ± 1.79 years of age, 14 males, 28 females in cycle two of the study. For personal and family reasons, four NGs dropped out and did not join the study's last stage. The flow of participating NGs is shown in Fig. 1.

3.2. Preparation model

Selected participant educators, consisting primarily of the CCs, collaboratively developed a tentative preparation program model based on the previous study's findings (Hutapea et al., 2021), implemented it, evaluated its rigor, then revised and refined the implementation processes. During the reflection stage of PAR cycle 1, the participants recommended some revisions, then implemented in cycle 2 (Table 1).

The final preparation model (Fig. 2) comprises the nursing graduates who have completed the internship program as the input. Second, the implementation processes are planning, implementing, observing, and reflecting activities. Third, the preparation program's core components at the institution, educator, and nursing graduate levels. Fourth, the essential concepts as the qualitative success indicators of the preparation program.

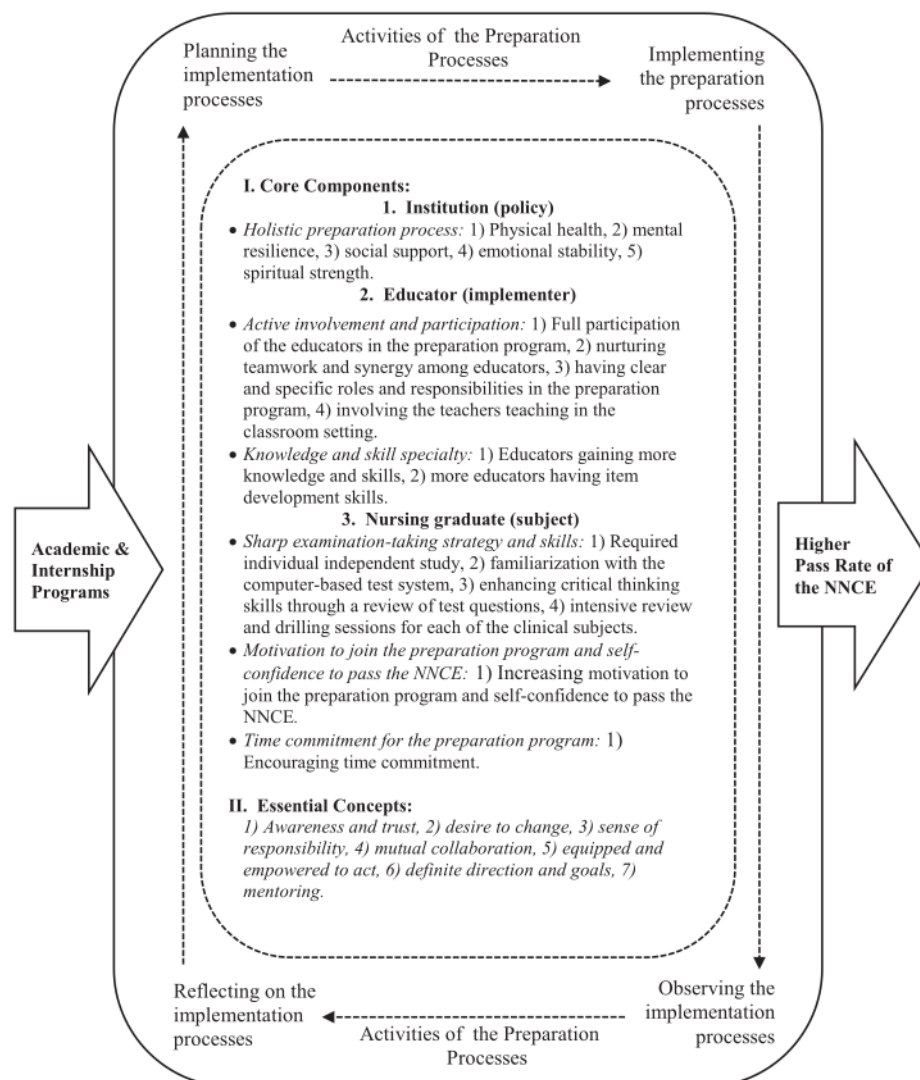


Fig. 2. Preparation program model to increase the competency level of nursing graduates and the institutional NNCE pass rate.

3.3. Outcome evaluation results

Quantitative success indicators were the outcome evaluation on improving the score achievements and perceived satisfaction level obtained by the NGs.

Table 2 indicates a significant increase in scores from the pre-test and post-test in every clinical subject. There is no significant difference between the results in the scores achieved in pre-test examinations of cycles 1 and 2, meaning that the NGs began with a similar competency level. The increment of scores from pre-test to post-test of each cycle and the post-test scores achieved in both cycles were not statistically different.

The scores achieved by the NGs belonging to cycles one (49.5 ± 9.18) and two (50.1 ± 10.2) in the NNCE nation-wide try-out are not significantly different. Comparing combined post-test scores of the two cycles (53.4 ± 2.03) with the combined scores achieved in the NNCE nation-wide try-out (50.5 ± 9.23) by the same NGs belonging to these same cycles shows no significant difference. Considering this, the participant educators agreed that the model's outcome already reached its optimal level at cycle two and unanimously agreed to end the PAR cycle. Table 3 shows significant improvement in levels of perceived satisfaction and readiness, and other indicators.

The NNCE nation-wide try-out program occurred two weeks after the second PAR cycle ended and was joined by all participating NGs except four. Within this two-week gap of time, the students were encouraged to relax and study independently at their own pace. There was no significant difference between the scores achieved in the preparation model's evaluation examination and the NNCE nation-wide try-out. The post-test scores achieved in cycles one and two were not significantly different, and scores achieved by each group of NGs belonging to the two cycles in the NNCE nation-wide try-out program were not significantly different either.

3.4. Essential concepts

Qualitative data from the informal semi-structured interviews, participant observation during the program and meetings during the development and evaluation process of the model generated the following 'essential concepts': Creating awareness and trust, desire to change, sense of responsibility, mutual collaboration, equipped and empowered to act, definite direction and goals, and mentoring (Fig. 2). Saturation was reached by the fifteenth interviewee.

3.4.1. Creating awareness and trust

The 'creating awareness and trust' concept emerged from the data during the meetings where awareness and trust were successfully built among the educators that boosted the enthusiasm for a change.

Table 3

Perceived levels of satisfaction and readiness among the NGs before (pre) and after (post) joining the implementation of the preparation model (Mean \pm SD).

No.	Indicators	Cycle 1 (n = 43)		Cycle 2 (n = 43)	
		Pre-*	Post-*	Pre-**	Post-**
1.	Overall satisfaction on the preparation program	3.0 \pm 0.80	4.1 \pm 0.93	3.2 \pm 1.12	4.1 \pm 0.92
2.	Mastery of computer skill	1.9 \pm 0.70	4.0 \pm 0.95	3.0 \pm 1.23	4.0 \pm 0.95
3.	Level of confidence to pass the NNCE	3.1 \pm 0.74	4.5 \pm 0.85	3.2 \pm 1.26	4.5 \pm 0.88
4.	Examination-taking skills	2.2 \pm 1.05	4.0 \pm 0.95	2.4 \pm 1.35	4.0 \pm 1.21
5.	Stress and anxiety on the coming NNCE	4.3 \pm 0.83	3.0 \pm 0.60	4.3 \pm 1.20	3.1 \pm 1.24
6.	Motivation for independent individual study	2.3 \pm 1.17	4.4 \pm 0.85	2.3 \pm 1.75	4.2 \pm 1.31
7.	The overall level of readiness for NNCE	2.5 \pm 0.67	4.3 \pm 0.50	2.8 \pm 1.07	4.3 \pm 0.70

Score from Likert Scale of 1 to 5: 1 = Very low, 2 = Low, 3 = Average, 4 = High, 5 = Very high.

*, ** $p = .000$ (each pair was compared statistically using paired *t*-test).

3.4.2. Desire to change

Some degree of resistance to change was observed due to time constraints, heavy academic load, and lack of confidence in their ability to participate in the study. However, the enthusiasm for a change and the need for organized preparation activities for the NGs overcame the resistance to change produced the 'desire to change' concept.

3.4.3. Sense of responsibility

The 'sense of responsibility' concept arose when participating educators expressed concern about the problem the NGs will meet if they failed in the NNCE and its effects on the faculty of nursing's accreditation level and then expressed a desire to participate.

3.4.4. Mutual collaboration

The essential 'mutual collaboration' concept emerged when the participants mutually agreed to accept specific roles and responsibilities assigned to them in all the study stages. These roles included taking observational notes on the teaching and learning processes, leading out in the review drills, coordinating events, and building a more extensive test bank volume.

3.4.5. Equipped and empowered to act

The essential concept 'equipped and empowered to act' surfaced during the empowerment seminars conducted to strengthen their knowledge and skills; they were equipped and empowered to carry out their roles and responsibilities optimally and become research partners instead of just mere research subjects.

Table 2

Scores achieved from the internal tool, the pre- & post-test examination (Mean \pm SD of scores in percent) from cycles one and two.

No.	Nursing Clinical Subject	Cycle 1 (n = 43)			Cycle 2 (n = 42)		
		Pre-*	Post-*	Increment	Pre-**	Post-**	Increment
1.	Med. surgical	38.7 \pm 5.39	52.2 \pm 7.89	13.5 \pm 8.10	43.3 \pm 5.76	53.7 \pm 4.57	13.1 \pm 6.65
2.	Critical care	37.7 \pm 6.32	52.8 \pm 5.50	15.1 \pm 7.00	40.0 \pm 6.94	53.4 \pm 8.57	11.5 \pm 5.21
3.	Maternity	34.8 \pm 7.80	52.4 \pm 4.99	17.6 \pm 7.21	39.1 \pm 5.09	54.3 \pm 2.87	15.7 \pm 5.91
4.	Pediatrics	40.7 \pm 5.05	54.1 \pm 3.11	13.4 \pm 4.80	40.0 \pm 5.41	52.1 \pm 3.5	17.6 \pm 6.63
5.	Management	35.5 \pm 6.47	52.2 \pm 4.57	16.7 \pm 7.70	45.8 \pm 5.91	52.4 \pm 4.09	18.5 \pm 9.62
6.	Community	40.2 \pm 7.60	54.5 \pm 4.82	14.3 \pm 7.94	50.2 \pm 8.45	55.2 \pm 4.88	12.4 \pm 8.64
7.	Family	41.8 \pm 4.68	53.2 \pm 5.61	11.3 \pm 7.13	45.3 \pm 6.77	53.8 \pm 5.46	12.4 \pm 8.64
8.	Psychiatric	39.4 \pm 5.29	52.9 \pm 3.32	13.6 \pm 5.45	42.4 \pm 6.66	54.6 \pm 6.65	15.9 \pm 9.44
9.	Geriatric	46.1 \pm 3.71	54.3 \pm 2.41	8.2 \pm 4.19	46.7 \pm 5.11	52.5 \pm 2.49	9.2 \pm 5.66
Average overall score for all clinical subjects		39.4 \pm 2.60 ¹	53.2 \pm 2.30 ²	13.7 \pm 2.00 ³	39.5 \pm 2.99 ¹	53.6 \pm 1.73 ²	14.1 \pm 3.05 ³

Legend: ¹ $p = 0.879$; ² $p = 0.343$; ³ $p = 0.495$ (each number pair was compared statistically using independent *t*-Test).

* ** $p = .000$ (each pair of clinical subject in each cycle compared statistically using paired *t*-Test).

3.4.6. Definite direction and goals

The 'definite direction and goals' concept developed when the participants showed initiatives in the following responsibilities: Setting measurable targets in exam scores, attendance, and timeliness, formulating weekly topics and schedules, setting clear and specific task details of participants, attending regular bi-weekly program evaluation meetings, supervising the case-study and critical thinking sessions in the drill and review programs, and in supervising the independent study sessions.

3.4.7. Mentoring

The 'mentoring' concept emerged when the participants played the roles of 'mentors' in encouraging and empowering their fellow participants, nurturing teamwork and synergy among educators throughout the study.

4. Discussion

The management and the participating educators perceived that they were tightly tied to the long-standing underachievement of their NGs in NNCE. They agreed that collective efforts were needed to solve this problem by providing a preparation program that adequately prepares the NGs for better performance in NNCE. The previous study's data (Hutapea et al., 2021) show that the components of an effective preparation program for the NNCE could be implemented in two separate programs. First, as an 'integrated preparation' program incorporated into both the baccalaureate and internship curriculums. Second, as an 'intensive preparation' program for the NGs that have completed their internship. It was thought that, ideally, the integrated preparation program should be used. However, the key participants agreed that the 'intensive preparation' model would be developed because it would take only about two months for implementation, instead of five years for the 'integrated preparation program.'

The results of the study indicate that the preparation model effectively prepared the NGs for the NNCE. The model's implementation significantly increased the institutional NNCE pass rate of the participating faculty of nursing from 31.0% in 2017 to 58.7% in 2018; the NNCE was taken not long after the completion of this study. This pass rate rose to 86.2% in 2019, after a complete adoption and implementation of the model one year after the study. Out of 278 nursing schools that participated in the NNCE that belong to the 61–100-takers category, this faculty of nursing got the highest institutional pass rate in the whole country (AINEC, 2019). Besides, it is thought that the significant increase in the pass rate was because, as planned, the preparation program ended within a few days from the NNCE schedule.

The founding principles of Knowles' theory of adult learning (Knowles et al., 2015) were incorporated into all stages of the study and were evident in the essential concepts that emerged. Ideally, nurse educators should be responsive to the students' needs (Dabney et al., 2019). It would have been easy for educators to ignore the needs of the NGs to be prepared for the NNCE. During the orientation, some educators expressed hesitancy to participate reasoning out that preparation for the NNCE was the sole responsibility of the NGs because they have completed their internship program. The educators' desire to support the study increased after realizing that, to some extent, they are also responsible for the performance of the NGs in the NNCE, reflecting their standing as educators, which aligns with Knowles' need to know why principle (Knowles et al., 2015).

The participating educators' motivation also increased during the empowerment, planning sessions, and notably when they observed the significant improvement in the pre-test and post-test scores achieved by the NGs in cycle one. The success experienced in cycle 1 motivated the participating NGs in cycle two, reflecting Knowles' motivation through the immediate value principle (Knowles et al., 2015).

A common consensus was reached that the faculty of nursing would adopt the model and that the involvement in the preparation program should be considered equivalent to the regular classroom teaching loads.

This is supported by Knowles' problem-solving approach to learning principle (Knowles et al., 2015).

During the study's activities, teamwork and learning from each other among the educators were encouraged and nurtured as defined by Knowles' learning through experience principle (Knowles et al., 2015). Teamwork was built because it was essential to the success of the program (Sanders, 2019).

One advantage of conducting the study in an institution where the researcher belongs is that the researcher may not have much difficulty recruiting participants, soliciting their cooperation, obtaining the faculty's management's support, and these participants would naturally accept the study's outcome. Thus, the researcher would be able to contribute new knowledge and initiate positive changes (Mallette and Rykert, 2018) in the institution on the preparation program and method for the NGs for the NNCE.

5. Limitations of the study and recommendations

The findings of this study might not be applicable to other faculties of nursing. The findings are further limited by the fact that the model was developed, implemented, and evaluated by only one faculty of nursing that volunteered to participate. It is recommended that the study's preparation model be tailored as an 'intensive preparation' model for the unique condition of other faculties of nursing. The model can also be customized as a more comprehensive 'integrated preparation' program proposed by the previous study, to be implemented in the faculty of nursing's academic curriculum where this study was conducted.

6. Conclusion

The researchers believe that there were essential factors that have contributed to the effectiveness of the preparation model developed, implemented, and evaluated in this study:

- The preparation model was developed from the evidence-based data collected from the previous study.
- The change from being resistant to being enthusiastic about change could be attributed to the increased awareness and trust, and sense of ownership of the model by being fully involved in decision-making in its planning, implementation, and evaluation.
- The initiatives of change emerged from the participants themselves instead of being dictated by the management. The researcher facilitated their desire to find solutions for the long-standing underachievement of the nursing school.
- All of the participants of this study's cycle were consistent in their commitment to participate throughout the study. Otherwise, it would be challenging to carry out the study if the turnover of participants was high.

This study demonstrated the potential of an effective preparation model in improving the competency level of NGs.

CRedit authorship contribution statement

Lyna M. N. Hutapea: Conceptualization, Methodology, Validation, Formal analysis, Investigation, Data Curation, Writing - Original Draft, Visualization.

Karnsunaphat Balthip: Conceptualization, Validation, Writing - Review & Editing, Supervision.

Sopen Chunuan: Conceptualization, Methodology, Validation, Writing - Review & Editing, Supervision.

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Declaration of competing interest

None.

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