

*Original article**Received: Oct. 29, 2024**Revised: Nov. 29, 2024**Accepted: Dec. 30, 2024**Published: Dec. 30, 2024***The Development of a Construction of Life and Careers Skills Instrument Based on the 21st Century for Nursing Students at Praboromarajchanok Institute**

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Abstract

Background: Regarding teaching and learning management, the purpose of creating the nursing program is to produce effective professional nursing students who meet the healthcare service and system. Professional nurses are required with proper knowledge, innovation, information, media, and technology, including life and careers skills for working through current society. The research objectives were 1) To examine and validate the confirmatory factors, and 2) to study the results of the construction of a life skill instrument that is based on the 21st Century in Life and careers skills. **Methods:** This study was a descriptive research design. Three hundred and sixty nursing students who are 2nd, 3rd, and 4th-year students enrolled at Praboromarajchanok Institute by random sampling from 27 Boromrajonani College of Nursing in Thailand. The research instruments were the construction of life skills questionnaires comprising 5 elements. The research data were analyzed using frequency, mean, standard deviation, and CFA. **Results:** The results represented that the Model is related to the evidence-based 5 elements of life and careers skills. Furthermore, careers represented the standard estimated of an observed variable total of 40 variables between 0.75 – 0.91. Chi-square 781, df 617, relative Chi-square 1.26, $p < .001$, RMSEA 0.02, SRMR 0.020, TLI 0.98. **Conclusion:** Nursing educational institutions should play an important role in producing new registered nurses with soft skills as a qualification, especially focusing on Life and careers skills that can show that the nurse can confront any problem properly. The development of this instrument can guide nursing educators to assess nursing students to identify their strengths and weaknesses. Allowing them to improve their competency before graduation, especially can help nursing educators to prepare the nursing students for entering the nursing profession on the right track. It enables concrete monitoring of nursing students' progress and can be used to regulate the curriculum and teaching methods. This also helps nursing educators to create a plan appropriately that supports supplementary curriculum activities for further educational development.

Key Words: Life and careers skills, 21st Century, Nursing students

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Introduction

Presently, Thailand has undergone rapid changes in the 21st century that affect the way of life for Thai people, as well as the ways of consumer culture, morality, and ethics. It leads to modifications in the health conditions of the Thai people as a whole picture. A professional nurse is a vital worker to a healthcare team in providing nursing care to people. Accordingly, nurses should stay concerned and keep up with health industry changes in the health industry. The main objective of each nursing educational institution is to produce effective professional nurses, it implies that the development of teaching and learning management is needed.

According to Boromrajonani College of Nursing, covered by Praboromarajachanok Institute, each place offers a Bachelor of Nursing Science program that focuses on integrating knowledge to practice in a realistic environment as if at the hospital, health service organization, or community. A nursing career is to work effectively based on compassionate care, morality, and professional ethics by creating teaching and learning arrangements according to the curriculum. Adding extracurricular activities that focus on the student-centered and based on Sufficiency Economy Philosophy (SEP). Producing effective nurses who characterize professions and provide humanized health care services according to the standards of the Thailand Nursing and Midwifery Council (Thailand Nursing and Midwifery Council, 2023).

Moreover, continuously developing the quality of students and building the recipients' confidence through an educational service. There are 3 desirable graduate characteristics specified that consist of 1) a nursing career aspect that emphasizes nursing knowledge and holistic nursing care based on various integrated sciences, expertise, and competency in health promotion and knowing how to use research processes. 2) International competency, promoting nursing students' English language skills, critical thinking, communication, and public relations. Additionally, nursing

students should keep up with social changes and be aware of leadership principles, perform appropriate personalities, and be good role models. 3) Life skills aspect, nursing students should be aware of the value of oneself, including other people and the environment, especially emphasizing morality and ethics in living life.

Various aspects and approaches can help educational institutions generate professional nurses with desirable graduated characteristics that are consistent with learning skills in the 21st century, such as critical thinking, problem-solving, collaboration, and teamwork skills (Armpat et al., 2018).

There will be teaching and learning styles that focus on promoting students to enhance their analytical thinking and ability to solve problems effectively by establishing learning experiences for nursing students, so that nursing students can gain their nursing knowledge, improve their nursing skills, and progress the capability for making decisions correctly, according to the principles and can solve the problems carefully together with a multidisciplinary team to retain health service effectively and safely.

According to Learning Skills Model from the partnership for 21st century network (P21), focuses on providing adolescents with knowledge and skills for living in the 21st century, which is globalization. It involves 3 main concepts as follows: 1) Learning and innovation skills, 2) Information, media, and technology skills, and 3) Life and careers skills (Tuntirojanawong, 2017). The main conceptions of aspects 1 and 2 are hard skills, which are knowledge and skills used at work. The third main conception is soft skills. This is significant to work, particularly in the nursing profession, which works with clients as a "human" who have a variety of ages, maturity levels, emotions, and environments. Acquiring soft skills requires experience in practice, action, and learning that will support students to graduate with crucial nursing skills in various fields and be ready to accomplish their professions efficiently. Regarding life

and careers skills, focusing on giving people the ability to be flexible and adaptable. Knowing life goals and determination, understanding society, and accepting cultural differences. Furthermore, having production potential and accepted required inspection if needed, as well as having leadership and responsibility (Sangprateetong, 2018)

Life and careers skills according to 21st century concepts comprise 1) flexibility and adaptability, 2) initiative and self-direction, 3) social and cross-cultural, 4) productivity and accountability, and 5) leadership and responsibility (Nokkaew & Mankong, 2021). Skills in this area will make nursing students more knowledgeable, indicating, practicing, and knowing how to restrain themselves. Additionally, a person with life skills will be reasonable and know how to indicate the right way of life—assisting yourself to be happy and being able to handle any problems on your own. Being able to thankfully adjust and survive in changing social conditions, also preparing for living in the future (Janjaroen & Nakaramontree, 2016). Evaluating and promoting students with proper life skills by allowing nursing students to know themselves physically, emotionally, and mentally will result in students adapting and living a happy life while studying; they can experience success through a studying path. Regarding the research study, it was found that the happiness factors in studying, learning style, and the environment that affect students' learning were significantly related to the desired graduated characteristics, based on the National Framework for Higher Education at the 0.01 level (Chantra et al., 2016). Driving the mission of producing graduates of the College of Nursing under the Praboromarajchanok Institute focuses on nursing students' life skills so that students can adapt and perform appropriate behavior within the nursing profession. Additionally, dealing with any problem effectively and studying with happiness. The researcher realizes that the life skills assessment of nursing students in the present uses the

assessment based on behavioral expectations. In addition, the questionnaire is not specific to Life and careers skills based on the context of the 21st century. Therefore, the researcher developed a measurement and studied the results of Life and careers skills based on the 21st century through the concept of Life and careers skills for nursing students. Regarding the expectations, there will be an instrument to assess nursing students' life skills that can provide more relevant outcomes. Particularly, using the information obtained from the research for planning the development of nursing students that suit the context. More importantly, it is to obtain desirable graduate characteristics as professional nurses for society and the community.

Research objectives

1. To examine and validate the confirmatory factors of the Life and careers skills assessment based on the 21st century in Life and careers skills aspects for nursing students.

2. To study the results of Life and careers skills based on the 21st century according to the assessment established by the researcher.

Research hypothesis

The confirmatory factor analysis model of the Life and careers skills assessment that is based on the 21st century for nursing students developed, is consistent with evidence-based.

Conceptual framework

The confirmatory factor model and model of 21st Century Outcomes and Support System) (Rotherham & Willingham, 2009). According to the literature review, it was found that Life and careers skills have 5 components: 1) Flexibility and adaptability, 2) Initiative and self-direction, 3) Social and cross-cultural skills, 4) Productivity and accountability, and 5) Leadership and responsibility as follows:

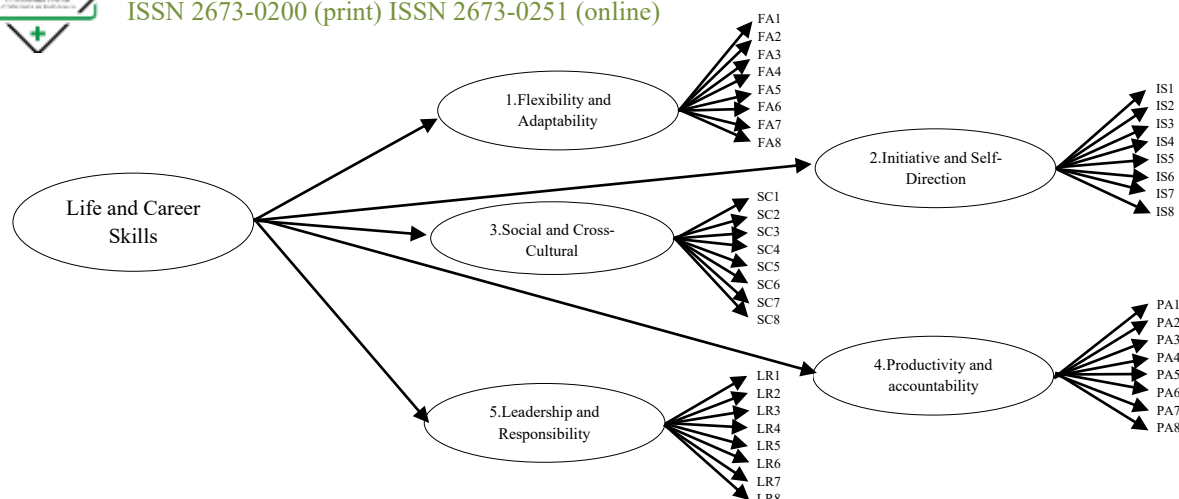


Figure 1: Conceptual framework of Life and careers skills based on 21st-century concepts for nursing students

Methodology

Study Design

This study was descriptive research with a cross-sectional design for examining the confirmatory factor analysis of Life and careers skills of nursing students based on 21st century concepts. The study was conducted among 2nd - 4th year nursing students who enrolled in the Bachelor of Science Nursing program at Boromrajonani College of Nursing, Praboromarajachanak Institute; the total number of participants was 360 nursing students that met the inclusion criteria. This study used a convenience sampling method, which is a nonprobability sample from ten colleges of nursing based on the proportion of the total population. This is because participants are selected based on availability, accessibility, or proximity to the researcher. Moreover, time, resources, and access are limited for this study.

Results of Sample Size Calculation

According to Comrey and Lee (1992), the sample group using EFA/CFA should not be below 50 participants. Thus, this study used the Yamane formula for calculating the sample size for this study, the formula is:

$$n = \frac{N}{1+N(e^2)}$$

Results Interpretation

Population Size (N): 3,604

Margin of Error (e): 5%

Sample Size (n): 360.04

This means that for a population of 3,604, a sample of 360 respondents is

sufficient to achieve results with a 95% confidence level and a margin of error of 5%.

Research instrument

The research instrument and demographic survey were used for data collection through this study and developed by the researcher based on the conceptual framework. Using the variable definitions obtained for creating the criteria of study to determine the number of questions and proceed with generating a draft questionnaire. It involves two significant questions. The first part is about general student information. The second part is a question that examines life skills based on the 21st century concept. The main concept of Life and careers skills provides 5 elements. There are 1-5 levels of characteristics that are based on the Likert rating scale with 12 items per component, totaling 60 items. The content and language validity were proved by three experts with an IOC value was 0.60-1.00. The questionnaires were revised based on experts' recommendations and tried on 40 nursing students who met the inclusion criteria similar to a sample group. Cronbach's Alpha presented values on 1) Flexibility and adaptability (0.94), 2) Initiative and self-direction (0.96), 3) Social and cross-cultural (0.96), 4) Productivity and accountability (0.96), and 5) Leadership and responsibility (0.95), respectively.

Data analysis

The demographic data was analyzed using descriptive statistics to

describe the sample characteristics. Regarding the confirmatory factor, confirmatory factor analysis was used to validate the constructor of components. Furthermore, the mean and Standard deviation were used to analyze nursing students' Life and careers skills with the program JAMOMI version 2.4.8.

Data collection

Formulating the questionnaire in an online format by creating a QR code, preparing a letter requesting permission to collect data, and coordinating with 30 nursing colleges. Moreover, collecting, analyzing, summarizing, reporting, and publishing data were based on planning.

Table 1: Summary of confirmatory factors analysis (first order) for observed variables of Life and careers skills indicators in each component (n 360)

Factor	indicators	b	SE	p	R ²
1: Flexibility and Adaptability	Indicators 1 st – 8 th	0.71-0.86	0.038-0.044	< .001 *	0.77-0.89
2: Initiative and Self-Direction	Indicators 9 th – 16 th	0.73-0.85	0.037-0.042	< .001 *	0.80-0.86
3: Social and Cross-Cultural	Indicators 17 st – 24 th	0.81-0.94	0.038-0.042	< .001 *	0.85-0.91
4: Productivity and Accountability	Indicators 25 st – 32 th	0.71-0.87	0.036-0.042	< .001 *	0.75-0.90
5: Leadership and Responsibility	Indicators 33 st – 40 th	0.75-0.84	0.035-0.042	< .001 *	0.83-0.87

* Mean to every indicator was significant According to Table 1, the results showed that the empirical indicators for every component of Life and careers skills that were analyzed with the JAMOMI version 2.4.8 program received the index values for checking the consistency of the model as follows: Chi-square 1854, df 730, relative Chi-square 2.53, p <.001, RMSEA 0.06, SRMR 0.029, TLI 0.93, CFI 0.93. The index of consistency met the specified criteria were RMSEA and RMR less than 0.05, relative Chi-square more than 2, and index TLI and CFI more than 0.95 (p> .05)

Research considerations

This research was considered by the research committee of Boromarajonani College of Nursing, Changwat Nonthaburi Certificate No. COE 63/014 on 6 July 2023

Research results

The study revealed that there were 138 second-year nursing students (38.33%), 117 third-year nursing students (32.51%), and 105 fourth-year nursing students (29.16%). As represented in Table 1, there were 40 empirical variables, all of which passed the conditions of the first order as a confirmatory factor analysis as follows:

(Schumacker & Whittaker, 2022; Kumar, 2012). Therefore, the researcher modified the model based on the index values to check the consistency of the new model as follows: Chi-square 781, df 617, relative Chi-square 1.26, p <.001, RMSEA 0.02, SRMR 0.020, TLI 0.98, CFI 0.99. Although the calculated p-value remains <.001. Hair et al. (2019) suggested that if n > 200 and the number of observed variables > 30, significant p-values expected are acceptable values, there is no need to adjust the model until p > 0.5.

Table 2: mean and standard deviation of each component of Life and careers skills of nursing students, PBRI (n 360)

Component of life skills and career	Mean and SD of each class and total nursing students							
	Total Students		2 nd year		3 rd year		4 th year	
	\bar{x}	SD	\bar{x}	SD	\bar{x}	SD	\bar{x}	SD
1: Flexibility and Adaptability	3.57	0.95	3.55	0.85	3.56	1.05	3.61	1.05
2: Initiative and Self-Direction	3.56	0.93	3.56	0.84	3.50	1.05	3.61	1.01
3: Social and Cross-Cultural	3.76	0.99	3.76	0.87	3.73	1.11	3.79	1.11

Component of life skills and career	Mean and SD of each class and total nursing students							
	Total Students		2 nd year		3 rd year		4 th year	
	\bar{x}	SD	\bar{x}	SD	\bar{x}	SD	\bar{x}	SD
4: Productivity and Accountability	3.55	0.93	3.56	0.83	3.46	1.09	3.57	1.01
5: Leadership and Responsibility	3.63	0.94	3.64	0.84	3.54	1.09	3.66	1.01

According to Table 2, the results revealed that overall nursing students evaluated themselves in Social and Cross-Cultural aspects with the highest score (\bar{x} 3.76, SD 0.99), Leadership and Responsibility (\bar{x} 3.63, SD 0.94), Productivity and Accountability (\bar{x} 3.55, SD 0.93), respectively. When considering the year separately, it signifies that nursing students evaluate themselves at an excellent level each year. Nevertheless, the 3rd-year nursing student had a mean average decrease. On the other hand, flexibility and adaptability aspects in 4th-year nursing students were increased. Initiative and self-direction, social and cross-cultural, productivity and accountability, and leadership and responsibility aspects were decreased in years 3 and 4.

Discussion

According to confirmatory factor analysis of the observed variable of Life and careers skills, it presented that the model was consistent with empirical data and evidence-based for all 5 components, signifying that the empirical indicators can examine Life and careers skills based on the 21st century concept. When evaluating a sample of nursing students, the average was at a good to very good level. It displayed that the curriculum design and extra-curricular activities of nursing colleges that affiliate with the Praboromarajchanok Institute covered 5 components of Life and careers skills. To respond to rapid changes in medical technology, health systems, and the increasingly complex care needs of patients are required more than before (World Health Organization, 2020, April 6). Consequently, educational institutions must produce professional nurses who have knowledge and nursing skills, especially soft skills that can provide effective nursing care to patients, including working with the healthcare team as a collaborative teamwork

that can confront globalization at present (Benner et al., 2010).

Life and careers skills help professional nurses provide proper nursing care to patients and families. According to Preechakoon et al. (2021), soft skills play a significant role in teamwork, communication, and conflict management, which is especially important for guild professional nurses to work effectively with a multidisciplinary team. Also, they can reduce medical errors and improve nursing care.

Meanwhile, professional nurses who have high Life and careers skills can handle and cope with stress, especially stress management and adaptation (Thailand Nursing and Midwifery Council, 2021). Particularly, in crises such as the COVID-19 outbreak, nurses should have resilience and a lower rate of burnout. Regarding the Thai nursing rules, it must always be taken into account that good life skills have a positive effect on successful working.

Regarding five domains showed that 2nd-year nursing students had a high score on Flexibility and Adaptability skills: Year 2 average scores are at a very good level and enhanced in Year 3 and Year 4 respectively (Table 2). The decrease in the average score in Year 3 can be explained as a result of stress from adjusting to studying the subject through the curriculum: both theoretical and practical subjects that emphasize remembering, understanding, applying, analyzing, and synthesizing skills. After 1 year of study, nursing students could adjust to their studies. Particularly, less stress in 4th-year nursing students is because the style or process can help nursing students understand. Nursing students become more skilled, in analytical and critical thinking.

Currently, the context of patient care is more complex in terms of treatment, technology, and patients' expectations of service. Therefore, Life and careers skills are

important for professional nurses. For example, the COVID-19 outbreak has shown the importance of nurses' flexibility, adaptability, and capability to work under extreme pressure and stress. Nurses with good Life and careers skills can handle any situation, such as crisis care (Smith & Johnson, 2022). Moreover, it is also a feature that will continuously lead to learning other new skills. Nurses can easily adapt to new roles and have more responsibility, particularly improve their leadership skills. Therefore, educational institutions should be aware that this aspect is vital for the development of nursing students nowadays.

Regarding the Initiative and Self-Direction skills, this had an average score for Year 2 at a very good level. It decreased slightly in Year 3 and Year 4 (table 2). This skill is extremely significant. This is because professional nursing requires personnel with high responsibility and be able to work independently and ready to learn throughout life. Nursing students with good initiative and self-regulation skills can acclimatize to challenges and have a greater chance of success in studying and working. Nursing students must manage their study time properly. Improving self-discipline in preparing for the examination, also nursing students can learn by them. Moreover, they can enhance analytical thinking and problem-solving, being responsible for nursing practice at the hospital. Participating in professional development activities, academic conferences, and having a work-life balance throughout the student's life in 4 years of study. Research by Lee & Park (2021) supported that nursing students with high self-regulation skills, provide better academic performance by applying knowledge for practice. Likewise, Martinez & Chen (2021) suggested that setting learning goals will help nursing students develop nursing skills better. According to Social and Cross-Cultural comparisons, the average score for 2nd-year nursing students is at a very good level. It decreased slightly in Year 3 and Year 4. In addition, this aspect had the highest average score among the 5 components (table 2).

When considering the decline in scores during the third year, it is found that the curriculum design for the third year, which includes a greater number of professional courses compared to other years, may lead to stress in students as they adjust to the changes. However, as time passes and students adapt, the average scores tend to rise again. Additionally, the highest average scores observed may be attributed to several factors: 1) The nature of the nursing profession requires constant interaction with others. Students have been practicing communication skills from the beginning of their studies and continuously through clinical practice in real-world situations, particularly in hospital wards (Chen & Wilson, 2021). 2) Teamwork training with interdisciplinary professionals, developed through theoretical, experimental, and practical teaching activities. 3) The curriculum's emphasis on social skills and cross-cultural learning, as nurses must provide care for everyone regardless of nationality or differences, adhering to the principles of equity and the professional code of ethics (Nursing Council of Thailand, 2023). 4) Creating learning environments through real-world scenarios and simulations, which encourage group work and foster continuous development of social skills. 5) The current healthcare system demands nurses with good social skills who can provide nursing care for diverse and cross-cultural patient populations (Taylor & Brown, 2022).

According to productivity and accountability domains, the average scores in the second year were found to be at an excellent level, decreased in the third year, and increased again in the fourth year (Table 2). The reasons behind the excellent average scores may include the strict academic assessment standards, given that nursing involves working directly with humans. Nursing students are trained to protect rights and prevent harm to ensure maximum safety for service recipients.

The curriculum is structured to progress from theoretical learning to experimental practice and then real-world application. For skills that pose a higher risk

of harm, students are first developed through simulations (SIM) or laboratory experiments. This equips them with practical skills and trains them in critical thinking, decision-making, and problem-solving in nursing contexts. Additionally, the unique nature of the nursing profession emphasizes real-world responsibility and instills a sense of accountability and prioritization of patient safety (Thompson & Brown, 2020). Training in management before graduation and practice in evaluating their performance helps students identify their strengths and weaknesses. This self-awareness and assessment enable them to improve their work, increasing the efficiency and clarity of patient care.

Furthermore, the average scores in leadership and responsibility domains were found to be excellent in the second year, decreased in the third year, and rose again in the fourth year (Table 2). Leadership and responsibility ranked as the second-highest scoring component out of all five. In the second year, students begin learning about their profession and practicing in laboratory settings, which provide a clearer understanding of their professional roles. At this stage, students are also at an age where they start developing maturity and gain confidence as they adjust from their first-year experiences. This leads to enthusiasm for learning, motivation to try new things, and active participation in group activities. Frequent small group assignments allow students to practice leadership skills within their teams.

However, during the third year, students face the most rigorous nursing coursework, which involves integrating complex knowledge from multiple disciplines. This, coupled with the stress and pressure of caring for patients in real-life scenarios where no harm must occur, can undermine their confidence in decision-making and their assigned responsibilities.

Despite these challenges, third-year students practice in small groups of eight members, where each student has the opportunity to act as a group leader. This involves coordinating with faculty or nurse mentors, overseeing group tasks, and

delegating responsibilities among team members. These activities foster leadership skills in incremental ways. By repeating these experiences and learning from peers, students gradually develop their leadership competencies. Over time, those who identify and address their weaknesses can enhance their abilities in Leadership and Responsibility, leading to continuous improvement.

Conclusion

Life and careers skills are essential soft skills for the nursing profession. They enable nurses to handle pressure-filled situations and make effective nursing decisions to ensure client safety. At the same time, these skills help nurses maintain a happy and balanced life in society. Particularly, promoting critical thinking, problem-solving, nursing students must analyze complex patient conditions and make sound clinical decisions. Also, communication skills, nursing student can provide clear communication with patients, families, and healthcare teams is crucial for effective care delivery. Nursing career works in multidisciplinary teams, requiring strong interpersonal skills to ensure coordinated care. Regarding career, practical skills and theoretical knowledge are essential to excel in nursing roles. Especially, lifelong learning, nursing career evolves rapidly, so continuing education and specialization are key for career growth. Thus, nursing education should emphasize both life and careers skills readiness by starting at the nursing schools, it should integrate these skills into both curricula and extracurricular activities, providing students with practical training every academic year to prepare them for real-world practice.

Recommendations for Future Research

1) Conduct longitudinal studies to track the development of Life and careers skills among students across cohorts. This will provide insights into trends and serve as a guide for planning Life and careers skills promotion in subsequent academic years.

2) Expand the development of evidence-based assessment tools for 21st century life skills, particularly in the areas of information, media, and technology literacy.

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