# A Narrative Review on Implementation of Innovative Teaching-Learning Strategies in Nursing Education

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**Abstract:-**

**BACKGROUND:** In the ever-changing classroom environment, a diverse group of students with varying backgrounds, personalities, and abilities comes together, demanding the use of imaginative and inventive teaching and learning approaches tailored to their individual needs. Many educational institutions struggle to effectively impart the intended subject matter to their students, leading them to rely on tools like PowerPoint Presentations and in-class activities. As a response to this challenge, a narrative review was undertaken to explore the effectiveness of innovative teaching and learning methods in nursing education.

**RESEARCH QUESTION:** Assess the efficacy of inventive teaching and learning approaches in nursing education.

**PURPOSE/OBJECTIVES:** 1. Determine the effectiveness of simulation in terms of knowledge, learning satisfaction, competence, self-confidence and self-efficacy. 2. Explore the students 'perception, experiences and impact on examination results using blended learning approach. 3. Examine the clinical competence, perception, satisfaction and goal achievement using the OSCE approach. 4. Study the effectiveness, practicability, perception, satisfaction and self-efficacy of Flipped classroom teaching strategy.

**METHODOLOGY:** The investigator conducted a comprehensive review aimed at assessing the impact of inventive teaching and learning methods in nursing education. The strategies encompassed Simulation, Blended Learning, Objective Structured Clinical Examination, and Flipped Classroom teaching. Electronic searches were performed to identify pertinent studies.

**RESULT:** Simulation creates a comfortable and secure environment while offering structured training, fostering a solid foundation of knowledge, skills, and experience for students. Blended Learning stands out as an optimal teaching model, blending self-paced online learning with live virtual sessions and in-person classroom instruction. OSCE serves as an objective tool for assessing student performance, while also assisting in identifying areas that may need additional focus.

**CONCLUSION:** To meet all educational objectives, a combination of teaching-learning techniques is essential as no single approach can fully address all the learner's needs.

**Keywords:-** *Simulation, OSCE, Blended Learning, Flipped Classroom Teaching and Nursing Education.*

## I. INTRODUCTION

The traditional teaching method lacks in motivating, developing knowledge, integrating the knowledge and after applying the knowledge. This ultimately leads students to have challenges in addressing the individual requirements of the patients. This problem can be resolved by transforming the students' concentration from superficial learning to active participation, which will also aid in improving the evidence based practice. Incorporating modern and innovative approaches in nursing education is crucial to enhance teaching strategies, which are evidence-based in order to bridge the gap between theory and practice, and adequately prepare students for their future roles. With the increasing technological advancements, students entering college have higher assumptions for learning, including the use of computers, the internet, and media. These tools provide immediate results, satisfaction, and give both students and faculty greater control over the learning process. Upon graduation from nursing school, nurses are expected to possess strong clinical judgment, be technologically proficient, capable of making critical decisions, and competent in caring for critically ill patients. Integrating technology effectively into traditional classrooms is imperative to develop innovative teaching methods that align with these expectations. The ongoing development and enhancement of innovative teaching and learning methods cater to the academic needs of students, promoting active participation, motivation, induction, and self-directed learning. It is essential to develop new approaches and educational models in nursing education to enable nurses to adapt rapidly to the evolving healthcare landscape. Many nursing schools have recognized this transition and are reviewing their missions, core competencies, and competency indicators. They are shifting their focus from traditional activity-based excellence to disseminating education that emphasizes higher-level competencies. These competencies include enhancing standards, fostering systematic thought, promoting evidence-based interventions, facilitating decision-making, and encouraging inter-professional partnership and cooperation. That means embracing modern and innovative education approaches in nursing education is critical to improve teaching strategies, reduce the gap between theory and practice, and adequately prepare students for their future roles as competent, technologically advanced healthcare professionals. Nursing schools must adapt to these changes by developing new educational models that align with the evolving healthcare landscape and promote higher-level competencies.

Simulation-based learning (SBL) involves creating a simulated environment that closely resembles the clinical setting, allowing students to practice and gain practical experiences. It provides an artificial situation that mirrors the reality of the clinical environment. Through SBL, nursing competence is enhanced across various aspects, including knowledge, skills, values, attitudes, communication, innovation, critical thinking, and cooperation. SBL offers a platform for students to develop and refine their abilities in a controlled and safe environment, enabling them to apply theoretical knowledge to practical scenarios. It fosters a comprehensive understanding of nursing practices and cultivates essential competencies that are essential for success in the field. By engaging in SBL, students can actively participate, make informed decisions, and collaborate effectively with others, thereby improving their overall nursing proficiency. It improves all three domains of learning, which are psychomotor, affective and cognitive domains. Simulation method of instruction allows undergraduate nursing students to perform intimate interventions on simulators in safe environment without causing any embarrassment and risk to the patients. It also ensures hands-on practice, which allows thinking based on ideas to become thinking based on facts and bridge the gap between theoretical knowledge and its clinical application. Simulation can be taught using both high fidelity and low fidelity simulators. High-fidelity simulators are ideal sized models with realistic anatomical features and they provide computerized results similar to original conditions. However low fidelity simulators are fixed models made up of resilient body parts and are used in the performance of clinical skills.

Blended learning refers to a teaching strategy that combines the utilization of online digital resources with traditional face-to-face instruction. This approach, also known as hybrid learning, has proven to stimulate forward-thinking behaviors in the learning process, moving away from a purely affirmational approach associated with automated learning. Blended learning encompasses several key components, including the relevance of topics, the creation of a customized learning environment, learner autonomy, scaffolding support, interactive discussions, reflective prompts, and calibration cues. The harmonious interaction of these factors within a blended learning environment stimulates and sustains learner engagement, resulting in improved academic performance. Blended learning entails integrating virtual learning methods previously described with elements of in-person teaching. The advantages of blended/hybrid learning methods encompass flexible learning opportunities in higher education, increased engagement among participants, and enhanced self-paced learning. The hybrid web-based teaching and learning approach is widely considered the most common and adaptable method, as it combines the benefits of synchronous and asynchronous learning approaches.

To assess clinical competence comprehensively and systematically, the OSCE (Objective Structured Clinical Examination) method is employed, which involves the use of multiple stations where students are assigned specific tasks. These stations encompass various modalities such as mannequins, standardized patients, short-answer questions, clinical reports, skills demonstrations, computer-based assessments, and simulators. The OSCE, although not a conventional test, serves as an evaluation approach characterized by the following elements: the design of multiple stations, each assessing different abilities; students rotating through all stations; standardized test content for all participants; assessment conducted using consistent tools and predetermined criteria. In an OSCE with numerous examiners, supervisors, and stations, students are grouped, and each examiner evaluates a specific number of students at their assigned station. This method is regarded as a reliable means of evaluating students' proficiency in specific skills, offering a controlled environment for clinical simulation. The OSCE holds immense value as an accurate and valid source for assessing both communication skills and psychomotor abilities. It ensures equitable evaluation by providing direct guidance, fostering a supportive educational environment, enhancing task-related competencies, maintaining consistent performance criteria, and mitigating bias among all participants.

Flipped classroom teaching is a progressive approach to learning that falls under the umbrella of blended learning, encompassing both online and in-person instructional practices. In this method, the pre and post-class sessions are conducted online, while the in-class time involves direct engagement with teachers. As a result, students come to class equipped with prior knowledge acquired through preparatory activities. The in-class teaching session emphasizes student-centered learning, allowing them to delve deeper into concepts through projects and activities after the class. The flipped classroom teaching approach comprises two key components: personalized pre-class instruction and interactive in-person activities. The pre-class personalized teaching encompasses a range of resources such as videos, readings, assignments, and quizzes. On the other hand, interactive skills are honed through face-to-face interactions with teachers during class time. This pedagogical method alleviates learners' apprehensions about performing assigned tasks by fostering a collaborative learning environment in which instructors and peers work together, leveraging their collective knowledge, skills, and attitudes to explore problems and find solutions. By employing this teaching and learning approach, students can actively assess their progress while engaging in nursing activities and formulating care plans, effectively addressing challenges and experiencing a sense of accomplishment in their nursing practice. This educational model not only evaluates learners' specific learning needs but also offers opportunities to clarify doubts and engage with peers to discover novel and innovative approaches applicable within the classroom setting.

## II. METHODS

A narrative review was conducted. Relevant studies were found after a thorough electronic search. The study solely included original research papers. The following electronic databases were used to conduct the search: ResearchGate, Science direct, Scopus, PubMed, CINHAL, Web of Science, ProQuest.

## A. Inclusion Criteria

- Original research papers related to the topic.
- The document which is available in full text and is widely accessible online.
- Studies that are presented in English.
- Research studies published from the year 2018 onwards.

## B. Exclusion Criteria

- Poor quality journal articles.
- A research paper that is published in a publication that does not have an ISSN number.
- Research studies that aren't listed in a journal database.
- Research studies for which there is only an abstract accessible.
- Studies that have been published in the local dialect.

## III.     RESULT

- Simulation-based learning has proven to be highly beneficial in enhancing students' perceived competence, self-confidence, and overall satisfaction with their learning experience. By recreating realistic clinical scenarios, simulation-based teaching creates a relaxed and non-threatening environment, allowing students to develop a solid foundation of knowledge, skills, and practical experience. Through this controlled setting, students can acquire essential competencies in a safe and supportive atmosphere, which in turn enables them to perform more effectively in real clinical settings. Simulation-based learning not only promotes skill development but also cultivates a sense of self-efficacy, empowering students to approach their future clinical practice with confidence. Moreover, the immersive nature of simulation-based teaching ensures that students are well-prepared to navigate the challenges of real-world healthcare environments. By providing a secure and less intimidating space for students to practice and refine their abilities, simulation-based learning ultimately contributes to their professional growth and success in clinical settings.

- Blended learning has demonstrated comparable effectiveness in educating medical students when compared to traditional learning methods. The incorporation of blended case-centered learning has exhibited encouraging outcomes in enhancing students' academic achievements. Furthermore, the blended learning approach (BLA) emerges as the most effective instructional model, integrating self-paced online learning, live virtual sessions, and in-person classroom interactions. These comprehensive strategies aim to provide aspiring educators with the chance to cultivate their fundamental cognitive understanding and practical teaching skills. By embracing a blend of various learning modalities, students can develop a robust foundation of knowledge while actively participating in the teaching and training processes. The utilization of blended learning methods not only facilitates the acquisition of theoretical concepts but also fosters the application of practical skills, empowering student teachers to thrive in their future professional endeavors.

- Objective Structured Clinical Examination (OSCE) offers a reliable and unbiased assessment of students' performance. Additionally, it serves as a valuable tool for pinpointing areas that may necessitate further emphasis. While OSCE is regarded as a robust method for clinical evaluation, there are certain limitations that warrant consideration in terms of management and educational aspects. Therefore, it is imperative to integrate student-centered teaching approaches to support the enhancement of their clinical decision-making abilities. By adopting instructional methods that prioritize the needs and growth of individual learners, students can develop and refine their capacity to make sound judgments in clinical settings.

- The flipped classroom teaching enhanced the overall knowledge covering all its domain among students. It is innovative, student centered and flexible method to improve critical thinking, increase independent learning and student teacher interaction. A flipped classroom strategy along with hybrid teaching methods is effective and suitable teaching-learning strategy aiding to tackle complex issues in nursing academic curriculum along with enhancing capabilities to look into several other challenges.

## IV.     DISCUSSION

### A. Determining the effectiveness of simulation among students in terms of knowledge, learning satisfaction, competence, self-confidence and self-efficacy.

A research design employing one-group repeat measurement was implemented on a group of 79 students who participated in an integrated care program at a university in southern Taiwan. The program focused on exigency and intensive care courses. The study utilized three simulation scenarios, and afterward, participants completed a self-administered questionnaire to evaluate the impact of Simulation-Based Learning (SBL) on their perceived competence, self-efficacy, and learning satisfaction. The self-administered questionnaires encompassed a Learning Satisfaction Scale (LSS), Simulation-Based Learning Evaluation Scale (SBLES), and Learning Efficacy Scale (LES). The research followed a timeline, commencing with a baseline measurement (T0), followed by three separate simulation scenarios (T1 to T3) spread three weeks apart over the semester, totaling 75 minutes of exposure. Descriptive and inferential statistics were employed to analyze the collected data. T-test and repeated measurement analysis of variance revealed a significant improvement from T0 to T3, indicating positive effects of the SBL approach. (Hung, C.-C. et al., 2021)

In a mixed-method research study, 28 junior-level bachelors of science in nursing students were selected for evaluation of simulation's effectiveness as an instructional method. To gather data, a 10-item online survey developed by researchers was employed, along with a focused group interview. On the first day of the class, students took a pre-test consisting of 10 NCLEX-style questions. Subsequently, they engaged in the OB Boot Camp simulation experience, followed by a post-test with another set of 10 NCLEX-style questions. An online survey comprising 7 questions, rated on a scale from 4 (strongly agree) to 1 (strongly disagree), was administered, alongside three open-ended questions. To gain

insights into the perceptions and experiences of OB Boot Camp, focused group interviews were also conducted. The results indicated significant improvement, as the mean pre-test score was 50%, rising to 85% in the post-test after the OB Boot Camp experience. The dependent paired t-test confirmed this improvement. The perception of the OB Boot Camp experience was positive, with ratings ranging from 3.67 to 3.87, underscoring the suitability of simulation-based learning as an effective educational tool. The focused group interview revealed that participants found the OB Boot Camp experience helpful, realistic, and confidence building. (Crews, C. S. and Minor, L. C. ,2018)

A group of 52 senior-level nursing students actively participated in a mega code simulation, which formed a crucial part of their clinical requirements before graduation. This innovative teaching strategy aims to enhance students' problem-solving abilities, foster creative and critical thinking, and ensure they can perform nursing practices safely and competently. Throughout the mega code simulation, the participants engaged in various essential life skills, such as airway management and medication administration during cardiac arrest scenarios. The simulation exercise lasted approximately 25-30 minutes, during which students conducted focused physical assessments, identified cardiac rhythms, called for a cardiac arrest code, and implemented appropriate interventions based on the cardiac algorithm. This dynamic environment exposed students to multitasking, prioritization, and effective communication with healthcare team members. Following the mega code simulation, studentstook part in a debriefing session, where self-reflection and self-evaluation were encouraged. Scenario-based prompts facilitated discussions on individual and team performance, allowing for the exploration of alternative interventions. This connection between theoretical knowledge and clinical practice significantly bolstered clinical reasoning and skill acquisition. To gauge their self-confidence in managing patients experiencing respiratory arrest, cardiac arrest, and neurological clinical condition deterioration events, participants were given a 27-item clinical decision-making self-confidence scale after completing the mega code simulation. The outcome revealed that 95% of students expressed satisfaction with the training received through mega code simulation, as it effectively improved their knowledge, skills, and readiness for real-life clinical scenarios. (Duprey, M. D., and Dunker, K. S.,2021).

*B. Exploring the students' perception, experiences and impact on examination resultsusing the blended learning approach.*

In this quasi-experimental research, 388 students enrolled in the first semester of nursing bachelor studies in Norway for two consecutive years were involved. The study focused on two batches: the 2016 batch consisting of 172 students, referred to as FF-students, who received traditional face-to-face teaching strategies, and the 2017 batch comprising 216 students, named BL-students, who were exposed to teaching strategies involving blended learning. Throughout the 16-week anatomy, physiology, and biochemistry (APB) course in the initial 1st semester, student active learning principles were applied to enhance learning outcomes. For the BL-students, the blended delivery involved lectures and seminars,

much like those provided to FF-students, but with reduced student-teacher hours (81 hours compared to 97 hours for FF-students). Additionally, the BL-students had access to 75 online digital resources (DIGIs) through their University's Virtual Learning Environment (VLE). To gather quantitative data for student evaluation of the APB course, an anonymous online survey was conducted. The survey used a validated questionnaire with eight questions, rated on a 5-point Likert scale from "1: totally agree" to "5: do not agree at all." The reliability of the student evaluation survey was found to be good (Cronbach's $\alpha = 0.866$). Furthermore, BL-students were presented with a separate online questionnaire, consisting of two questions about the DIGIs. Statistical analysis was performed using SPSS Version 24. The results indicated that BL-students, compared to those receiving traditional face-to-face teaching, exhibited better performance on their national exam, with a small to medium effect size. The course evaluations from students further supported the blended learning approach, with small to medium effect sizes, indicating that students felt their learning outcomes were achieved through digital resources. Moreover, they reported better understanding of the instructor's assumptions and higher satisfaction with the web-based learning environment. (Grønlien, H. K. et al. ,2021).

The researcher conducted research surveys titled "A Virtual Learning-only or Blended Learning Approach to Higher Education during the COVID-19 Outbreak" using Google Forms software and distributed them among participants during the 2020-21 academic year. All participants were BSc (Hons) Sport and Exercise Science degree students from first to third-year batches at Edge Hill University. Specifically, students enrolled in 9 selected modules where graduate teaching assistants (GTA) were responsible for teaching delivery were invited to complete the survey. The "virtual learning-only survey" was distributed online through the institution's learner management system (LMS) during the time when COVID-19 restrictions were in place, and teaching-learning was entirely virtual. On the other hand, the "blended learning" survey was made available both online and in-person during a period when a blended/hybrid approach was implemented. The 28-item survey aimed to evaluate nine aspects of student satisfaction, including teaching on the course, assessment andfeedback, academic support, organization, learning opportunities, management, learning resources, student voice, and COVID-19 safety. Participants responded using a 5-point Likert scale. Additionally, an open-ended question allowed students to express their viewpoint on the virtual/blended teaching-learning experience. Participants were expected to answer all questions, most of which were based on a 5-point Likert scale. To compare the two learning methods (virtual and blended) and assess between and within-year group differences, independent samples t-tests were utilized. Results indicated that blended learning consistentlyled to higher satisfaction scores across all survey subsections, resulting in a significantly higher overall course satisfaction score. When comparing Year 1 and Year 2 students, the former showed significantly higher perception scores ($p < 0.005$) for teaching the course, assessment and feedback, organization and management, learning resources, learning community, and academic support in the virtual learning survey. However,

there were no significant differences in Year 1 within-year group students. On the other hand, within-year group differences were observed in Year 2 students, with higher perception scores reported inthe blended learning survey for assessment and feedback, academic support, and learning community. (Finlay, M. J., Tinnion, D. J. and Simpson, T. ,2022).

The study employed a quasi-experimental approach to assess the enhanced performance of student teachers. Two distinct groups, namely the experimental group and the control group, were chosen as study participants. The Experimental group received instruction in the teaching of science paper using blended learning approach (BLA), while the control group was taught through the conventional method. The experiment spanned eight weeks and consisted of 53 participants, divided into 29 students in the experimental group and 24 students in the control group. For the experimental group, students were provided access to an online learning platform. The intact group of 29 student teachers from one teacher education college constituted the experimental group, while the intact group of 24 student teachers from another College of Education served as the control group. This careful selection ensured that the control group's access to learning materials through the online platform was fully controlled, both within and outside the college. The primary objective of the study was to examine the impact of technology-enhanced BLA on the performance of student teachers in the Teaching of Science paper. After completing the instruction for both the experimental and control groups, a post-test was administered. The researchers utilized various statistical analyses through the statistical program SPSS to examine the collected data. The results showed a significant improvement in the performance of student teachers following the implementation of BLA. (Maria Josephine Arokia Marie, S. ,2021).

*C. Examining the clinical competence, perception, satisfaction and goal achievement using the OSCE approach.*

During the critical phase of the COVID-19 pandemic, the Conference of Medical School Deans in Spain took an important decision to develop a database of cases and questions for a virtual Objective Structured Clinical Examination (OSCE) that could be conducted in each medical school. To ensure comprehensive evaluation of different competencies and clinical specialties required for the medicine degree, ten stations were carefully selected. These stations covered clinical cases from various fields, including internal medicine, primary care, orthopedic surgery, pediatrics, gynecology, and psychiatry. The administration of the CCS- OSCE took place over two days, specifically on June 6 and June 20, 2020. On the first day, 2463 students from thirteen medical schools participated, while 366 students from the remaining three medical schools took part on the second day. Each station was assigned a time frame of 12 minutes, and the entire test lasted a maximum of 120 minutes. In cases where students were unable to complete a station within the allocated time, the station would automatically exit, and the next station in the sequence would commence. As part of the evaluation process, all medical schools conducted a satisfaction survey with 11 stations of

theCCS-OSCE. The majority of the students viewed the test as a positive and enriching learning experience. This initiative proved to be a valuable and adaptive method of conducting clinicalexaminations amid the challenging circumstances of the pandemic. (García-Seoane, J. J. et al.,2021)

The S-OSCE will be designed to replicate orthopedic operative cases, encompassing procedures such as ORIF (open reduction/internal fixation) of distal radius fracture, bone forearm fracture, bipolar hip hemiarthroplasty, tibial plateau fracture, midshaft humerus fracture, proximal humerus fracture, distal biceps repair, primary total knee replacement, thoracic/lumbar laminectomy, unilateral/bilateral ankle fracture, and distal femur fracture. For this study, a total of 34 postgraduate trainees from the 3-5 years batch of a 5-year Canadian orthopedic residency program actively participated. The development of the OSCE cases involved a thorough and systematic approach, integrating valuable inputs from attending surgeons, residents, and surgical education consultants. Over the course of three years (2016-2018), the OSCE was conducted on four separate occasions, encompassing a diverse range of cases, varying in complexity from less intricate to more intricate scenarios. The study's analysis indicated not only the financial viability of the approach but also its practicality, with seamless programmatic integration, ensuring feasibility and effectiveness. (Gillis, M. E. et al. ,2020).

The level of stress perceived by students was assessed both before and after the administration of OSCE, and they were asked to rate it on a scale from 0 (indicating no stress) to 100 (representing maximum stress). Additionally, professors were also consulted to provide their perception of the stress that students might experience during the OSCE, according to their judgment. Furthermore, the participants' perception of difficulty, academic performance, and final academic grade were also evaluated. The OSCE scenarios encompassed various stations, namely BP+EKG, Venipuncture, CPR, Nutritional evaluation, Respiratory evaluation, Mobilization, and Interpersonal Skills. After analyzing the results, it was found that the professors' perception of difficulty showed higher scores for CPR, venipuncture, and nutritional evaluation stations compared to the students. However, the students, on the other hand, reported higher levels of perceived difficulty than their professors in the case of BP+EKG, Venipuncture, CPR, Nutritional evaluation, Respiratory evaluation, Mobilization, and Interpersonal Skills stations. (Conde, P. S. and Clemente-Suárez, V. J. ,2021)

*D. Studying the effectiveness, practicability, perception, satisfaction and self-efficacy of flipped classroom teaching strategy.*

A research study utilizing mixed methods was conducted among 396 undergraduate nursing students from three universities in Sri Lanka. The participants were administered a 20-item survey known as NSR-FC (Nursing students Readiness for flipped classroom), which encompassed four factors: personal readiness, environmental readiness, pedagogical readiness, and technological readiness. The students' responses to the survey were rated on a five-point Likert scale, with values ranging from 1 (indicating strongly

disagree) to 5 (indicating strongly agree). The survey was conducted after the students had attended the scheduled flipped classroom teaching sessions. Furthermore, the students voluntarily participated in focus group discussions that revolved around 18 open-ended questions. The purpose of these discussions was to gain insights into the students' beliefs regarding their willingness, opportunities, and challenges associated with incorporating the flipped classroom teaching approach. These focused group discussions were conducted in English, extended from 45 minutes to one hour, and were digitally recorded to ensure accurate reproduction. Upon analyzing the results, it was observed that the students obtained high scores in the domains of personal readiness, technical readiness, and pedagogical readiness according to the NSR-FC survey. However, in contrast, the students scored relatively lower in the environmental readiness domain of NSR-FC. Furthermore, the students perceived numerous benefits of the flipped classroom teaching method, including enhanced knowledge acquisition, implementation of knowledge, flexible learning opportunities, utilization of audio-visual aids, and improved face-to-face interaction between students and teachers. (Youhasan, P. et al. ,2021).

A research study employing a mixed method approach was conducted among 100 nursing students enrolled in the 3rd and 4th year B.SC nursing programs in Northern Cyprus and Nicosia. The participants were selected based on the inclusion criterion of passing the medical surgical nursing course. The research tools utilized in the study included the VTE knowledge questionnaire, which incorporated the latest updates on VTE presentation from CDC Prevention 20P, along with Antithrombotic therapy and thrombosis prevention. This questionnaire comprised two sections: the first section encompassed 5 questions related to subject demographics, and the second section consisted of three domains on VTE knowledge with 50 true/false questions. The first domain assessed basic knowledge with 13 items, of which only 2 were false, while the rest were true. The second domain focused on risk factors, comprising 13 items, all of which were true. The third domain consisted of 24 items, with 20 being true and 4 false. To recruit participants, posters announcing the study were exhibited on notice boards, and interested students voluntarily agreed to join the research. The research study was conducted in three phases: pretest, intervention phase, and post-test. During the pretest phase, participants completed demographic features and the VTE evaluation questionnaire, taking approximately an hour. In the intervention phase, students received educational content through the flipped classroom teaching method, involving 5 sessions, quizzes, and case studies, which they attended at their convenience. The entire course was designed to be completed within 5 weeks. The results of the independent t-test indicated a higher mean in the post-test than in the pretest after the educational interventions, demonstrating a significant improvement in the VTE knowledge domain. In addition, students highlighted the strengths and weaknesses of the flipped classroom teaching method, with 75% identifying strengths such as deep motive learning, technological advancement, team-based learning, and overall satisfaction. However, 50% also mentioned weaknesses, including the duration of videos and time-consuming tasks.

(Al-Mugheed, K. and Bayraktar, N. ,2021).

A descriptive cross-sectional study was undertaken among 160 nursing students in South Korea. The participants were aged 20 years or older, had completed the fundamental nursing course without clinical nursing practice experience, and had previous experience with flipped learning simulation practice. All students signed a consent form to participate in the study. To assess the students' level of academic achievement, a Korean version of the academic achievement scale was used, consisting of 9 questions answered on a 5-point Likert scale. Additionally, a self-efficacy scale was designed to evaluate students' self-efficacy, comprising 17 general self-efficacy items and 6 social self-efficacy items, also rated on a 5- point Likert scale. Furthermore, the learning satisfaction scale, consisting of 24 questions using a 5-point Likert scale, was employed to measure the students' level of learning satisfaction. The data collected from the participants' responses were analyzed using descriptive statistics to examine the general characteristics of the study participants. Then, the differences in academic achievement were assessed through t-tests and ANOVA tests. Moreover, the correlation between academic achievement and related factors was evaluated using Pearson's correlation coefficient. The findings revealed that self-efficacy was the most influential factor affecting the academic achievement of nursing students, followed by gender, experience with flipped learning, learning satisfaction, age, and the analysis ability of the flipped learning class. (Gu, M. and Sok, S. ,2021)

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