Effect of Flipped Classroom Strategy Versus Conventional Teaching Methods on Academic Achievement, Self-confidence and Perception of Nursing Students

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Abstract

Background: The flipped classroom is an instructional approach that emphasizes students' active learning while reconstructing traditional teaching techniques. **Aim:** This research aimed to evaluate the effect of flipped classroom strategy versus conventional teaching methods on academic achievement, self-confidence and perception of nursing students **Design**: A quasi-experimental research design (two groups "control & study", ″Posttest only″) **Setting**: The present research conducted at obstetrics and gynecological nursing department in faculty of nursing, Benha University in the first semester of the 2023–2024 academic year. **Sample**: A purposive sample of 345 third year nursing **Tools:** Five tools were used: A structured self-administered questionnaire, nursing students' perception of learning strategy scale, self-confidence in learning scale, students' opinions scale and students' challenges questionnaire. **Results:** The mean scores regarding academic achievement, self-confidence and perception showed highly statistically significant difference between flipped classroom and conventional teaching groups post-implementation with (p- value<0.001). Also, the majority of student's opinions show positive satisfaction of the flipped classroom strategy implementation. **Conclusion** The findings of current research concluded that the flipped classroom strategy effectively improved academic achievement, self-confidence and perception of nursing students compared to conventional teaching methods **Recommendation:** Utilization of flipped classroom for nursing courses that can benefit most from flipping by saving class time for the application of necessary skills gained after instruction.

Keywords: Academic Achievement, Conventional teaching methods, Flipped classroom strategy, Self-confidence, Perception.

Introduction

Nowadays, typical lecture has lack of required efficacy. Over the past few years, there have been changes in the needs, goals, and performance of learners. In collaborative, learner-centered learning environments, learners desire to be present and frequently have quick and simple access to information **(Swensen, 2022).** Inverted classrooms, often referred to flipped classrooms (FCs), are a type of educational practice in which traditional lecture and homework completion are replaced **(Shahnama et al., 2021).**

Flipped classrooms is a simple teaching strategy in which students begin by watching brief videos at home before moving on to more involved and dynamic classroom instruction. Instead of just sitting there and listening to instructions, this approach gives students the chance to actively engage in education. Students can work at their own pace and go back to review any material they

did not understand the first time. Additionally, it makes better use of class time, which some students may find valuable. (**Shao & Liu, 2021).**

In contrast, the conventional teaching methods limit the chance of students teaching participation as it has the potential to impede or stifle student engagement. The conventional methods mainly depend on lecturer providing information, therefore there isn't much opportunity for interactions between students and teachers or amongst students. Students' progress and contentment can be facilitated by the kinds of interactions that are demonstrated in flipped classes (**Anjomshoaa et al., 2022**).

According to **Shana & Alwaely, (2021)**, there are many more benefits associated with the flipped classroom model. These include assisting struggling students in watching recordings multiple times and fostering better collaboration between teachers and students. All of these factors contribute to a positive learning environment where students are free to learn at own pace, strengthen the relationships with one another, and share knowledge more freely.

Additionally, flipped classroom improves student's satisfaction and confidence as it enables them to be more engaged in learning so students already have a preconceived idea before learning in class which lead to creating better enjoyable learning time (**Muhibbuddin et al., 2020).** Also, Student's engagement and active participation in learning process results in better achievement and increase in student's self-confidence and satisfaction. Therefore, it is crucial to take nursing student confidence and satisfaction into account during nursing education (**Park and Cho, 2022).**

Antenatal care is a program of preventative obstetric medicine designed to maximize the result for both mother and fetus by means of routine pregnancy monitoring. Health care providers still face a struggle in maintaining prenatal indicators for this vulnerable group. Therefore, nursing students should be qualified enough and have wide range of knowledge and perception regarding antenatal care content (**Zubair et al., 2022).**

In nursing education, it is necessary to create new teaching strategies and models so that nurses can adapt quickly to developments in the medical profession. The complex healthcare needs of today's society cannot be handled by nurses using outdated instructional techniques, such as teacher-centered lectures. As a result, a lot of nursing education settings have seen this trend and have started to reevaluate their goals and adapt new teaching methods as flipped classroom teaching approach (**Fan et al., 2020**).

Significance

Teaching process is a complicated process that necessitates communication between teachers and students in addition to the newest technology in science education is required for students to understand subject's content in an efficient manner. The utilization of the flipped classroom enables students to watch scientific-related movies and presentations that have been put together by instructors and learn science outside of the classroom. Instructors not only provide student-centered learning throughout class time, but they also enforce collaborative learning among students (**Shana & Alwaely, 2021).**

In conventional learning, students typically work on tasks on lower levels of

learning inside the classroom such as remembering and understanding—take place in class. But with the flipped classroom strategy, learning is reversed, allowing students to complete lower-level cognitive assignments outside the class and then participate in higher-level learning with classmates and the teacher in attendance. **(Anjomshoaa et al., 2022).**

Maternity nursing students who have access to skilled, capable, cooperative learning techniques will produce high-quality in the area of maternity care as nurses play a critical role in protecting mothers from harm and enhancing the quality of their pregnancies. All of that necessitates acquiring better knowledge and abilities during teaching years because graduates who can apply their talents in challenging patient care scenarios are needed in today's environment **(Abd El Aliem et al., 2019).**

Aim of the research:

This research aimed to evaluate the effect of flipped classroom strategy versus conventional teaching methods on academic achievement, self-confidence and perception of nursing students.

Research hypotheses:

H1: Nursing students who use flipped classroom strategy will exhibit better academic achievement than those who use conventional teaching methods.

H2: Nursing students who use flipped classroom strategy will exhibit higher self-confidence than those who use conventional teaching methods.

H3: Nursing students who use flipped classroom strategy will exhibit better perception than those who use conventional teaching methods.

Conceptual definitions:
Flipped classroom strategy:

This is students-centered learning strategy that involves video or audio-based direct instruction provided at home followed by active learning and group work during class in which the instructor uses the information from the prior home video or audio session to assist students as they explore concepts on their own in the classroom **(Swensen, 2022).**

Conventional teaching methods:

It is a traditional type of teacher-centered learning wherein most of the time lecture method is used. And both parties can engage in person where the majority of the learning process takes place in the classroom **(Naing et al., 2023).**

Student achievement:

The degree to which a student has fulfilled their immediate or long-term learning objectives **(Say & Yildirim, 2020).**

Student self-confidence

It can be defined as a sense of faith in one's skills, attributes, and judgment is self-confidence which increases one's sense of worth and facilitates goal achievement **(Onyegeme-Okerenta, 2022).**

Student perception:

The belief often held by students and based on the way in which something is regarded, understood, or interpreted **(Zaim et al., 2020)**

Subjects and method

Research Design:

A quasi-experimental research design (two groups "control &study", ″Posttest only″) was utilized to achieve the aim this research. Establishing a cause-and-effect relationship between an independent and dependent variable is the goal of a quasi-experimental

design, just like in a true experiment. In quasi-experimental design, subjects are divided into groups according to non-random standards. With the exception of treatment, all characteristics of the control and experimental groups should be the same. By selecting groups that are as similar as possible or by controlling for confounding variables in their analysis, researchers attempt to take into account any potential confounding variables when using this type of design. **(Thomas, 2023).**

Study Setting:

The study was conducted at obstetrics and gynecological nursing department in faculty of nursing, Benha University in the first semester of 2023/2024 academic year.

Sampling:

Sample type and size:

A purposive sample technique was used to recruit (345 third year nursing students) were purposely drawn from total of (498 nursing students) in obstetrics and gynecological nursing department "first semester" at academic year 2023-2024. **The final sample size** was reached 345 students because 50 students were shared in pilot study were excluded, 34 didn't fulfill inclusion and exclusion criteria, 14 refused to participate in the study. Then, throughout the research, 18 and 15 students were drop out in study and control groups respectively due to absent of some sessions. Also 22 of students didn't complete data collection sheets (14 from study group & 8 from control group).

Sample criteria and technique:

According to list of third year students in obstetrics and gynecological nursing department obtained from information technology (IT) unit in faculty of nursing at Benha University. There were two groups (study "flipped classrooms"=168 students and control "conventional teaching methods"=177 students). The nursing students in first half of list was assigned for control group and the nursing students in other half of list was assigned for study group. The nursing students were selected according to following **Inclusion criteria:** have computers or smart phones and internet access. **Exclusion criteria:** remaining students to repeat the Obstetrics and Gynecological Nursing course and had previous experience with flipped classrooms in both groups.

Tools of data collection:

Five tools were used:

Tool I: A structured self-administered questionnaire: This tool was constructed by researchers after reading a related literature. It included two parts:

Part (1): **Personnel characteristics of nursing students:** it comprised of 5 items (age, gender, marital status, residence and attending any workshops about antenatal care).

Part (2): Nursing students' achievement (knowledge) questionnaire: It was designed by researchers after reviewing a related literature **(Suman, 2021), (Patil and Biradar, 2022)** and **(Kaur et al., 2018)**. It was designed to measure nursing students' knowledge regarding antenatal care. It comprised of 6 major sections; each part consisted of questions with total of 68-multiple-choice questions. Each question has four options (one right answer and three wrong answers). These sections were: **General knowledge about antenatal care** "6 items" (definition, aim, components, schedule of antenatal visits during pregnancy, schedule of visits for high-risk pregnant women, objective of booking visit and objective of subsequent Visits), **Knowledge regarding history taking** "8 items" (personal, menstrual, obstetrical, gynecological, contraceptive, medical, surgical

and family history), **Knowledge regarding antenatal examinations** "4 items" (purpose of general examination, pelvic examination, vaginal examination and abdominal examination), **Knowledge regarding antenatal investigations** "3 items" (routine investigations, specific investigations and ultrasound), **Knowledge regarding health education** "15 items" (diet, rest and sleep, exercises, clothing, shoes, bathing, teeth, breasts, bowel, coitus, travelling, medications, exposure to irradiation, smoking and warning (danger) signs & symptoms) **Knowledge regarding Common minor discomforts of pregnancy and relief measures** "32 items; 2 question for each discomfort" (morning sickness, fainting, fatigue, urinary urgency and frequency, ptyalism, heartburn, backache, shortness of breath, constipation, leg cramps, ankle edema, insomnia or sleep difficulties, leucorrhea, varicosities, breast enlargement and hemorrhoids)

Scoring algorithm:

All knowledge questions were weighted according to items in each question (multiple choice questions). Each question was given a score (1) in case of correct answer and a score (0) in case of incorrect answer or don't know. The sum of the answers to every question was used to determine the total score. Total mean score of achievement was attained by calculating the mean of responses for all questions. The possible range of scores is from 0 to 68 with the higher score indicating better achievement. As well as, the following categories applied to the total knowledge score:

- Excellent: 80% -100% correct answer (54.5 – 68 degree)
- Good: 70%-<80% correct answer (48 – <54.5 degree)
- Acceptable: 60%-<70% correct answer (41 – <48 degree)

- Nonacceptable: <60% correct answer (<41 degree)

Tool II: **Nursing students' perception of learning strategy scale:** It was constructed by the researchers after looking through the relevant literature **(Shana and Alwaely, 2021)** and **(Karadag and Keskin, 2017)**. The student survey included (13) statements about the attitudinal component of the students' experience using the flipped classroom learning method in comparison to the traditional method were included in the student survey..

Scoring algorithm:

Each statement was scored (2) for "agree" response a score (1) for "uncertain" response and a score (0) if the response was "disagree". The total score was calculated by adding the scores of all statements. Total mean score of perception was obtained by calculating the mean of responses for all statements. The possible range of scores is from 0 to 26 with the higher score indicating better perception. The total perception score was categorized as the following:

- Positive: the overall scores 75% - 100% (19.5-26 score)
- Negative: the overall scores <75 (<19.5 score)

Tool III: **Self-confidence in learning scale:** It was adapted from **(Jeffries and Rizzolo, 2006).** It composed of 8 items to assess nursing students' self-confidence in learning toward flipped classes learning method versus conventional method regarding antenatal care.

Scoring algorithm:

Each item was rated on a 5-point Likert scale and assigned as strongly agree (5), agree (4), uncertain (3), disagree (2) and strongly disagree (1). Total mean score of self-confidence was obtained by calculating the mean of responses for all items. The possible range of scores is from 8 to 40 with the higher

score indicating higher self-confidence. Total score was classified into:

- High self-confidence > 75% (33-40 score)
- Moderate self-confidence 60% - 75% (28-32 score)
- Low self-confidence < 60% (8-27 score)

Tool IV: Students' opinions scale: It was structured by the researchers based on the related literature **(Bhandari et al., 2017)** and **(Abd El Aliem et al.,2019)** to assess the opinions of the study group regarding the flipped classroom at the end of the study. It includes 14 statements implied their responses either "Yes" (score 1) indicating positive opinion or "No" (score 0) indicating negative opinion.

Tool V: Students' challenges questionnaire: It was developed by the researchers based on the related literature **(Eichler and Peeples, 2016)**, **(Elian, 2018)** and **(Eryilmaz and Cigdemoglu, 2019)** to assess obstacles or challenges that were faced while applying the flipped classroom strategy. It is a 7-item questionnaire that implied student's responses either "Yes" (score 1) or "No" (score 0) indicating an existing or non-existing challenge.

Tools validity:

Three jury experts from Benha University who specialize in Obstetrics and Gynecological Nursing assessed the validity of the questionnaires to make sure the tools were applicable, clear, relevant, and thorough. According to suggestions and comments, a few minor changes were needed, such as paraphrasing a few sentences and removing others to avoid repetition. The same experts were then shown the updated tools once more until they were all satisfied that the tests were appropriately prepared. The tools were regarded as legitimate by the experts.

Tools reliability:

It was done by Cronbach's Alpha coefficient test, which stated that the internal consistency of research tools as following:

Tool	Cronbach's alpha value
Tool I: Nursing students' achievement (knowledge) questionnaire.	Internal consistency (α =0.86).
Tool II: Nursing students' perception of learning strategy scale.	Internal consistency (α =0.87).
Tool III: Self-confidence in learning scale.	Internal consistency (α =0.91).
Tool IV: Students' opinions scale.	Internal consistency (α =0.77).
Tool V: Students' challenges questionnaire.	Internal consistency (α = 0.84).

Ethical considerations:

The study approval obtained from Scientific Research Ethical Committee of the Faculty of Nursing at Benha University for fulfillment of the study. A necessary official permission from the Dean of the Benha Faculty of Nursing was obtained for the fulfillment of the study. Before applying the tools, the researchers explained the aim of the study to gain nursing students" confidence. The researchers obtained informed consent from nursing students to participate in the study and confidentialities was assured. The study didn't have any physical, psychological or social risks on the nursing students. Also it didn't involve any immoral statements and respect women rights. Additionally, students received assurances that the data would only be used for research and would not have an impact on their evaluation for the current or upcoming academic course. The students could stop participating in the study at any moment.

Pilot study:

It was conducted on 10% of the total sample size (50 nursing students) to test the objectivity, clarity, applicability and feasibility

of the tools and to identify any issues specific to the statements, such as the order of questions and clarity, and to learn about any potential challenges and issues that could arise for the researchers and obstruct the gathering of data. Estimating the amount of time required for data collection was also helpful. To prevent sample contamination, changes were made in accordance with the pilot results, and the pilot sample was removed from the study.

Field work:

A written formal approval was obtained from the dean of the faculty of nursing at Benha University to obtain their consent to conduct the research after explaining its aim. The research was carried out October 2023 and completed at December 2023 lasting for three months. The study was carried out through the following phases;

Preparatory phase:

It is the first phase through which the researchers reviewed the related literature about the topic. This guided the researchers in preparing the necessary data collection tools and helped them understand the scope of the research topic. The tools were given to jury committee and jury results were made.

Interviewing and assessment phase:

The researchers welcomed the nursing students, introduced themselves, stated the importance of the research, provided the nursing students with all needed information to assure their adherence to interventions and took signed consent to participate in the research. Firstly, the structured self-administered questionnaire was used to evaluate the personal characteristics of all nursing students. (Tool:I) About two minutes were needed on average to complete the questionnaires. In this phase, researchers started to determine the educational needs for

each nursing student which help in the planning phase.

The nursing students were asked to complete a personal information form with regard to their access to the internet because the use of digital tools and internet access is crucial to the flipped classroom approach. This form was used to find out if they had internet access, smartphones, or PCs. To get around the problem of not having enough technical tools, students who did not have internet access at their residences or dorms were allowed to use computer labs on specific days.

Planning phase:

Generally, planning phase started by established the study's objectives related to antenatal care lecture. Based on current textbooks, research articles, websites, references, and other sources, the researchers created the study materials and tools. **For the control group:** "conventional teaching method group" The researchers created a lecture and created a "handout" with theoretical content for the nursing students to receive. **For the study group:** "flipped classroom strategy group" Since learner-centered learning is the focus of the "flipped classroom strategy group", the planning phase began with gathering all the information about the concept, goal, and methodology of the flipped classroom strategy. For the flipped classroom to be effectively implemented, the researchers needed to have a firm understanding of the curricula being taught at the time. The researchers invested a lot of time in creating an effective flipped classroom. It took some time to make the videos by themselves. After the videos were produced, the researchers set up classroom exercises that resulted in student interaction. The researchers' time and effort may seem overwhelming at first, but if a solid system is in place, it can be used to fine-tune and enhance the learning environment.
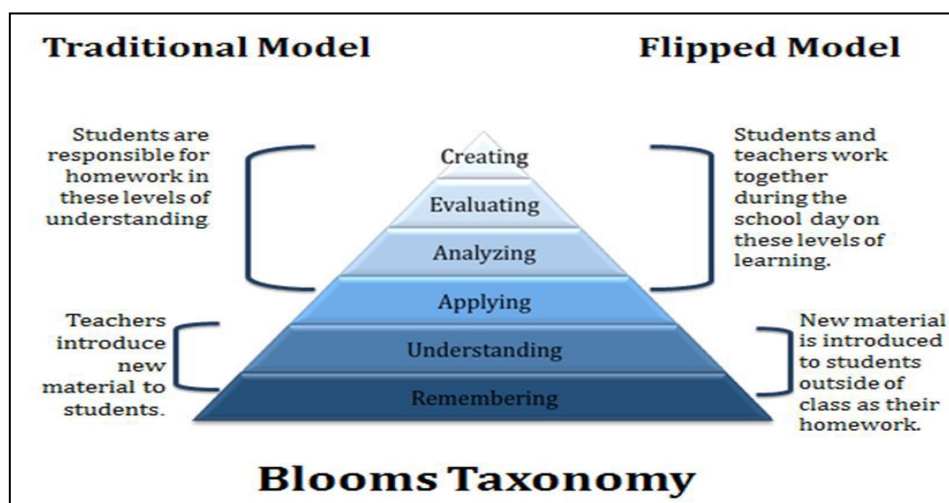
Figure (1): Bloom's taxonomy in flipped classroom (Williams, 2013)

Implementation phase

For the control group (conventional teaching method group): The Researchers presented online lecture for the control group in only one session according to a predesigned schedule of the obstetrics and gynecological health nursing course. PowerPoint presentations of the lecture were given to the students. To address any unclear points, the researchers led a group discussion in an online classroom for all of the students. Additionally, a summary of the lecture's key themes was provided at the conclusion.

For Flipped classroom strategy group: the nursing students received an orientation session for two hours in form of online lecture, to be trained on the process of flipped classroom strategy. Using PowerPoint presentations, the researchers (teachers) gave a detailed lecture to the students on the concept, goals, procedures, and advantages of the flipped classroom learning strategy. Additionally, the researchers gave each student an illustrated handout that explained the flipped classroom approach.
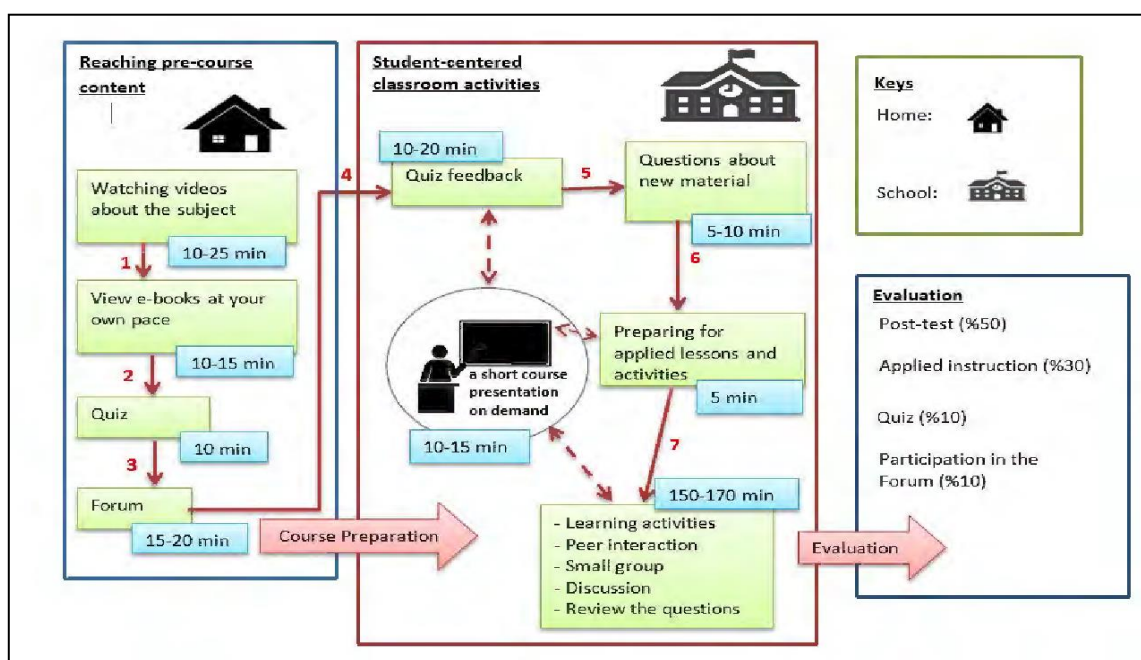

Figure (2): Flipped Classroom Design (Talan and Gulsecen, 2019)

Before the class time, the researchers provided videos which previously created by them to be watched by the students, in addition to the same handout given for the control group regarding antenatal care lecture to the study group. Also, the researchers suggested average resources to direct the students and help them in preparing the lecture. The study group was told to thoroughly read the materials, prepare the lesson, and complete additional readings. The students were also instructed to prepare their questions and take notes.

During the class time, allowing more time in the classroom for in-depth topic exploration and the creation of worthwhile learning opportunities. Class activities were varying and included: group working, problem solving, discussion, find answers together to the questions they prepared and using original document analysis, speech presentation and skill development. Active learning allowed for higher-order thinking skills including problem-solving, teamwork, and design were given more attention in class with the assistance of the teacher and other students. After the class time, students check their understanding and extend of learning.

Challenges were found during the implementation process for teachers (they need more preparation and struggle to control students' pre-class activities, and their workload is higher), students (they lack motivation to watch the video lectures or study the material outside of class), and technical issues (they have issues with technology and internet access).

Evaluation phase:

Two weeks after implementation, all the students of both groups were evaluated for their achievements regarding the theoretical content of antenatal care lecture by using (tool: I). Then, the students of both groups were assessed for perception of learning strategy and self-confidence in learning (tool: II and III). After that, only students in study group (flipped classroom group) were asked for their opinions about flipped classrooms strategy and challenges they faced while applying the flipped classroom strategy.

Statistical analysis:

Data were checked before being entered into the computer. The gathered data will be coded, computerized, arranged, and examined using the proper statistical procedures and tests. Version 22.0 of the Statistical Package for Social Sciences (SPSS) was employed. Standard deviations, means, and frequencies and percentages were all included in descriptive statistics. The study hypothesis was tested using inferential statistics and the independent t test. The association between the achievement (knowledge), perception, and opinion scores was examined using the correlation coefficient. P-value > 0.05 indicated no statistically significant difference, $P \leq 0.05$ indicated a statistically significant difference, and $P \leq 0.001$ indicated a highly statistically significant difference for all statistical tests conducted.

Limitations

There are no Limitations other than the resistance of some students to implementing any new teaching strategies, such as the flipped classroom strategy.

Results:

Table (1): Clarifies that (72.0% & 77.4%) of both flipped classes and conventional classes groups respectively were in the same age group (21- years) with a mean age of 20.92±0.613 and 20.94±0.610 years old respectively. Pertaining to gender, (66.1% & 70.1%) of both flipped classes and conventional classes groups respectively were female. As well as, (70.8%) of flipped classes group & (79.7%) of conventional classes

group lived in the rural area. Pertaining to the marital status, it was indicated that (95.8% & 92.7%) of both flipped classes and conventional classes groups respectively was single. According to attending any workshops about antenatal care, (100.0%) of both groups didn't attend any workshops about antenatal care. Therefore, no statistically significant difference were found between both flipped classes and conventional classes groups regarding personnel characteristics (p > 0.05).

Table (2): Reveals that, the total mean scores of achievement (knowledge) regarding antenatal care increased in the flipped classes group compared to the conventional classes group after implementation; 57.22±4.33 versus 52.47±6.43 respectively with highly statistically significant difference between two groups (p≤.001).

Figure (1): Represents that (55.4 % and 29.9%) of both flipped classes and conventional classes groups had excellent level of achievement respectively. Meanwhile, (6.5% and 11.3%) of both groups had nonacceptable level of achievement respectively.

Table (3): Clarifies that, the total mean scores of self-confidence increased in the flipped classes group compared to the conventional classes group; 33.62±2.77 versus 28.38±2.64 respectively with highly statistically significant difference between two groups (p≤.001).

Figure (2): Clarifies that 84.5 % of flipped classroom group compared to 49.7% of conventional classes group had high confidence level. Meanwhile, (3.6% and 16.4%) of both groups had low confidence level respectively.

Table (4): Shows that, the total mean scores of perception elevated in the flipped classes group compared to the conventional classes group after implementation; 20.65±2.82 versus 18.54±2.15 respectively with highly statistically significant difference between two groups (p≤.001).

Figure (3): Demonstrates that (79.8 % and 68.9%) of both flipped classes and conventional classes groups had positive perception respectively. Meanwhile, (20.0% and 31.1%) of both groups had negative perception respectively.

Table (5): Indicates that, (100.0%) of the flipped classrooms students stated that everyone in the group have responsibility, (97.0%) of them reported that flipped classrooms increased the possibility of the teacher's interested in each student, (95.8%) of them mentioned that flipped classrooms was the innovative teaching-learning method and (95.2%) found that the dependence of the students upon the teacher was lessened.

Table (6): Indicates some challenges to apply that flipped classrooms strategy, it was illustrated that (79.8%), (78.6%), (61.3%) and (58.9%) of the flipped classrooms students reported the following challenges: feeling of being stressed with the amount of responsibility, difficulty in learning with no internet access or computer, technology requirements can contribute to increasing costs and flipped classroom includes a heavy reliance on student motivation by the lecturer, which is a real challenge; respectively.

Table (7): Clarifies that; there was a highly significant statistical positive correlation between total achievement (knowledge) score and total scores of (perception and opinion) in flipped classes group after implementation (P≤ 0.001).

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Table (1) Distribution of the studied sample in both groups according to their personnel characteristics (n=345).

| Personnel characteristics	Flipped classes group		Conventional classes group n=177		X2	P value
	No.	%	No.	%		
Age:						
20-	33	19.7	29	16.4	**1.37**	**0.502**
21-	121	72.0	137	77.4		
>22	14	8.3	11	6.2		
Mean ± SD =	20.92±0.613		20.94±0.610		**independent t test= 0.407**	0.684
Gender:						
Male	57	33.9	53	29.9	**0.603**	**0.427**
Female	111	66.1	124	70.1		
Marital status:						
Single	161	95.8	164	92.7	**1.59**	**0.207**
Married	7	4.2	13	7.3		
Residence:						
Rural	119	70.8	141	79.7	**3.61**	**0.057**
Urban	49	29.2	36	20.3		
Attending any workshops about antenatal care:						
Yes	0	0	0	0.0	-	-
No	168	168	177	100.0		

Table (2): Mean score of achievement (knowledge) regarding antenatal care in both groups after implementation (n=345).

Knowledge	No. of items	Possible score	Flipped classes group n=168 Mean ± SD	Conventional classes group n=177 Mean ± SD	Independent t-test	P value
General knowledge about antenatal care	6	0/6	4.61±1.06	4.01±1.36	4.55	0.000**
Knowledge regarding history taking	8	0/8	6.51±1.44	5.96±1.71	3.23	0.001**
Knowledge regarding antenatal examinations	4	0/4	3.52±0.75	3.21±0.82	3.66	0.000**
Knowledge regarding antenatal investigations	3	0/3	2.65±0.66	2.36±0.78	3.74	0.000**
Knowledge regarding health education	15	0/15	13.03±1.40	12.27±2.36	3.63	0.000**
Knowledge regarding Common minor discomforts of pregnancy and relief measures	32	0/32	26.91±4.06	24.66±5.15	4.51	0.000**
Total Mean ± SD	**68**	**0/68**	**57.22±4.33**	**52.47±6.43**	**8.08**	**0.000****

**A Highly Statistical significant p ≤ 0.001
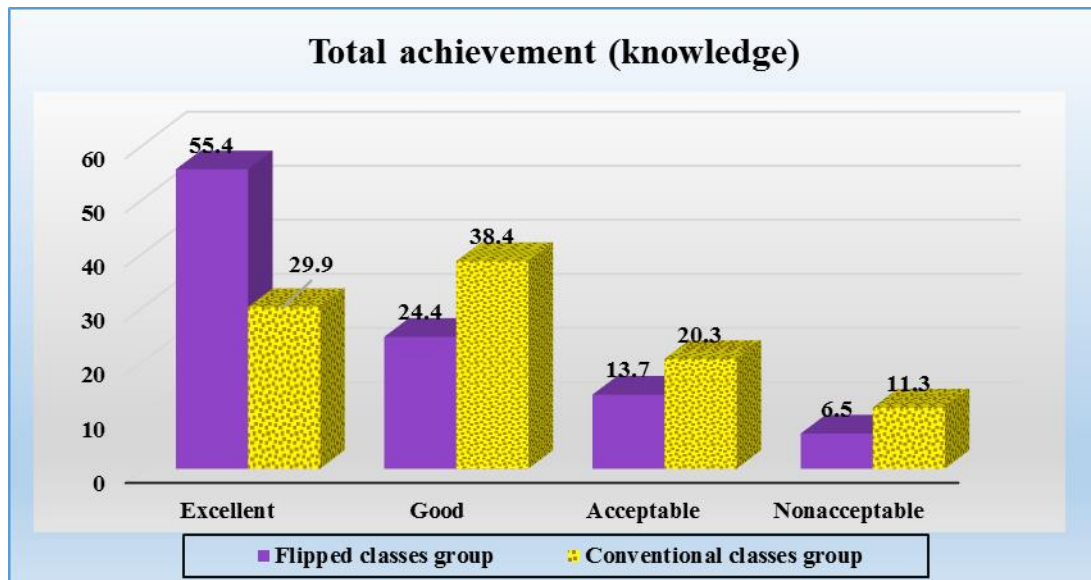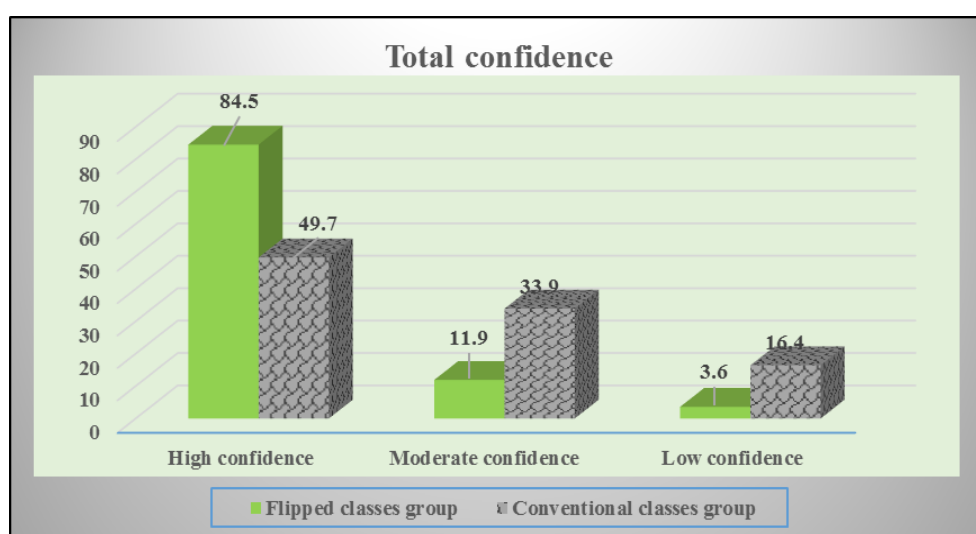

X^2=22.90   **P- value**=0.000

Figure (1): Distribution of studied sample in both groups according to total achievement (knowledge) score about antenatal care after implementation (n=345).

Table (3): Mean scores of self-confidence in learning in both groups after implementation (n=345).

Statements	Possible score	Flipped classes group n=168 Mean ± SD	Conventional classes group n=177 Mean ± SD	Independent t-test	P value
I am certain that I am grasping the material covered in the lesson the instructor gave me.		3.84±1.33	3.38±1.30	3.28	0.001**
I have no doubt that the essential material required for the mastery of instructional lectures was covered in the classroom.		4.18±0.78	3.92±0.70	3.20	0.001**
I am confident I'm learning in the classroom what I need to know to complete the tasks at hand in a clinical environment.		4.08±0.79	3.81±0.68	3.45	0.001**
The researchers used helpful resources to teach the classroom.	1-5	4.52±0.72	4.21±0.76	3.88	0.000**
As the intern nurse, it is my duty to acquire the necessary knowledge through classroom exercises and creative problem-solving techniques.		4.25±0.90	2.86±1.19	12.20	0.000**
When I don't understand a concept taught in the classroom, I know where to turn to for assistance.		4.21±0.81	2.98±0.86	13.75	0.000**
I am aware of how to apply classroom exercises to acquire important knowledge and abilities.		4.29±0.80	3.93±0.93	3.88	0.000**
It is not the researcher's job to inform me during class what I should know about the material of the classroom activities.		4.24±0.66	3.31±1.03	10.02	0.000**
Total Mean ± SD	**8-40**	**33.62±2.77**	**28.38±2.64**	**17.92**	**0.000****

**A Highly Statistical significant p ≤ 0.001

$X^2 = 47.59$ **P- value** = 0.000

Figure (2): Distribution of studied sample in both groups according to self-confidence score after implementation (n=345).

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Table (4): Mean scores of perception of learning strategy in both groups after implementation (n=345).

Statements	Possible score	Flipped classes group n=168 Mean ± SD	Conventional classes group n=177 Mean ± SD	Independent t-test	P value
Attaining high level of enjoyment, increased involvement and decreased boredom	0-2	1.48±0.61	1.29±0.63	0.513	0.004*
The reading I did outside of class made the lesson easier and more effective for me to understand.		1.67±0.57	1.52±0.66	2.21	0.027*
Helping interacting with content and memorizing it.		1.29±0.69	1.07±0.75	2.85	0.005*
Appreciating this learning method more than other method		1.66±0.61	1.50±0.70	2.26	0.024*
Fostering more optimistic viewpoints regarding classroom instruction.		1.66±0.53	1.54±0.57	1.99	0.046*
Provided deep discussion of the assigned reading materials which is essential.		1.37±0.56	1.20±0.51	2.94	0.003*
Improved performance is attributed to the fact that can freely discuss the details of the study material with the classmates.		1.65±0.55	1.52±0.59	2.12	0.035*
Making the teaching/learning process more engaging.		1.64±0.55	1.50±0.59	2.22	0.027*
Grasping concepts and ideas better through watching video.		1.60±0.49	1.42±0.67	2.59	0.003*
Making the learning process easier and more motivating.		1.82±0.46	1.68±0.58	2.49	0.013*
Providing more chances for interpersonal communication than other approaches.		1.80±0.47	1.67±0.56	2.41	0.16*
Facilitating content interaction as opposed to using other techniques.		1.47±0.56	1.31±0.55	2.63	0.009*
Making learning process more fun and meaningful.		1.53±0.59	1.33±0.64	2.96	0.003*
Total Mean ± SD	**0-26**	**20.65±2.82**	**18.54±2.15**	**7.76**	**0.000****

*A Statistical significant p ≤ 0.05   **A Highly Statistical significant p ≤ 0.001

Total perception
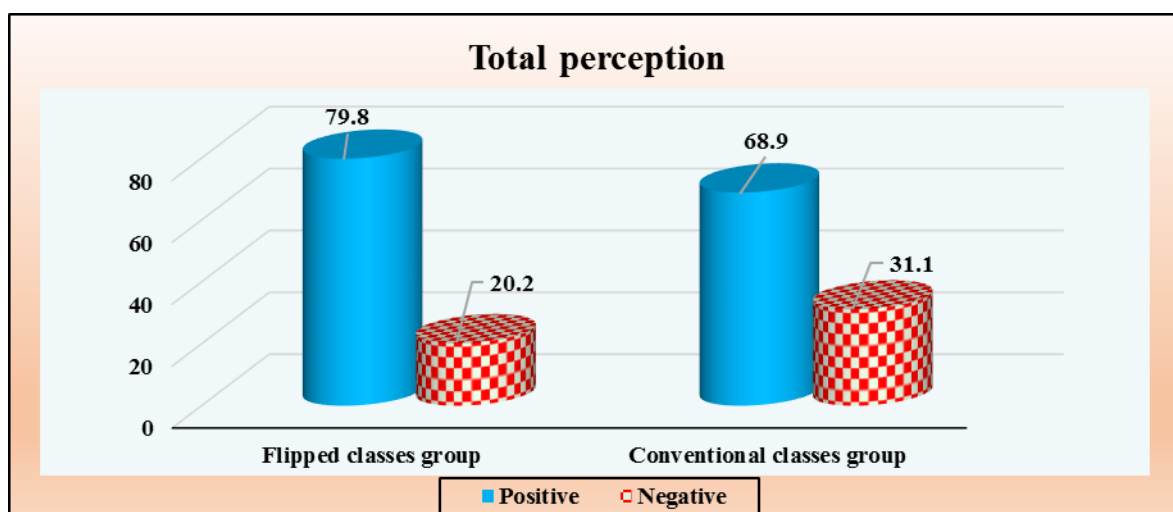
X^2=8.74   **P- value**=0.003*

Figure (3): Distribution of studied sample in both groups according to perception score of learning strategy after implementation (n=345).

Table (5): Distribution of flipped classrooms students according to their opinions about flipped classrooms strategy after implementation (n=168).

Students' opinions	Flipped classrooms group	
	No.	%
Flipped classrooms made the course material simple to comprehend.	149	88.7
Flipped classrooms made certain that false information was corrected.	144	85.7
Flipped classrooms increased the possibility of the teacher's interested in each student.	115	68.5
Flipped classrooms provide a variety of learning materials and activities to promote learning.	163	97.0
The dependence of the students upon the teacher was lessened.	160	95.2
Flipped classrooms enhanced communication skills and self-confidence.	155	92.3
Flipped classrooms enhanced teamwork cooperation.	119	70.8
Everyone in the group have responsibility.	168	100.0
Flipped classrooms made the ideas within the group to be discussed more positively.	159	94.6
Flipped classrooms improved decision-making & critical thinking skills.	157	93.5
The use of flipped classes made it easier to apply information in clinical settings.	120	71.4
Flipped classrooms was the innovative teaching-learning method.	161	95.8
Overall satisfied with this teaching method.	129	76.8
Utilizing flipped classrooms in other nursing courses.	124	73.8

Table (6): Distribution of flipped classrooms students according to the challenges they faced while applying the flipped classroom strategy (n=168).

Students' challenges	Flipped classrooms group	
	No.	**%**
Feeling of being stressed with the amount of responsibility would have to hold in	134	79.8
It can be difficult for teachers to determine whether or not their students are watching the films.	76	45.2
Students with learning difficulty find problem in application of this new strategy.	94	56.0
Difficulty in learning if there is no internet access or computer.	132	78.6
The internet or electricity may break down.	84	50.0
Technology requirements can contribute to increasing costs.	103	61.3
Flipped classroom includes a heavy reliance on student motivation by the lecturer, which is a real challenge.	99	58.9

Table (7): Correlation between total achievement (knowledge) score and total scores of (perception and opinion) in flipped classes group after implementation (n=90).

Variables	Total achievement			
	r	**P-value**	**r**	**P-value**
Total perception	0.547	0.000**	0.659	0.000**
Total opinion	0.415	0.000**	0. 453	0.000**

**A Highly Statistical significant p ≤ 0.001

Discussion

Flipped classrooms are a cutting-edge teaching method compared with conventional teaching methods in terms of minimizing direct instruction, increasing interaction and teamwork, and improving social interaction and cultural diversity. Flipping learning has been widely used in higher education for learning a variety of subjects, including nursing subjects **(Chen, 2021).**

The aim of the current research was to evaluate the effect of flipped classroom strategy versus conventional teaching methods on academic achievement, self-confidence and perception of nursing students.

Concerning personal characteristics, the findings of the current research showed that there was no statistically significant difference between both flipped classes and conventional classes groups regarding

personnel characteristics (p > 0.05) that reflected group homogeneity. Additionally, nearly three quarters of both groups (flipped and conventional classes) were in age group (21- 22 years) with a mean age of 20.92±0.613 and 20.94±0.610 years old respectively with more than two thirds of them were female and lived in ruler area. Pertaining to the marital status, it was indicated that the majority of both groups was single. According to attending any workshops about antenatal care, all students in both groups didn't attend any workshops about antenatal care.

The above-reported results were similar to the results of **Shana & Alwaely (2021)** which reported no statistical difference between flipped and traditional groups at the beginning. Additionally, **French et al., (2020)** showed that both flipped and traditional groups had similar general characteristics with no statistically significant difference.

Concerning mean score of achievement (knowledge) regarding antenatal care in both groups after implementation, it was clear that, the total mean scores of achievement increased in the flipped classes group compared to the conventional classes group after implementation (57.22±4.33 versus 52.47±6.43 respectively) with highly statistically significant difference between two groups. In addition, more than half of students in the flipped classes group had excellent level of total mean score of achievement after implementation compared to the only more than one quarter of students in the conventional classes group.

This might be due to students in the flipped classroom group had a chance to deepen their understanding and increase the knowledge and skills level which results in better abilities and achievement. Also, better academic achievement was attributed to the

fact that students could freely discuss the details of the study materials, ideas and abilities with their classmates.

The above-reported results agreed with **Swensen, J. (2022)** who concluded that the general student's achievement and success in the flipped classroom group was significantly higher than those in traditional group (p<0.05). Another study reinforced the idea of student success with using flipped classroom, **Muhibbuddin et al., (2020)** concluded that student learning outcomes revealed that the initial knowledge of students was similar in both experimental and control groups while the post test of the experimental group was higher than the control group. The experimental group was in the high category and the control group was in the medium category, according to learning outcomes enhancement.

The previously mentioned outcomes supported the first research hypothesis which stated that nursing students who use flipped classroom strategy will exhibit better academic achievement than those who use conventional teaching methods.

Regarding mean scores of self-confidence in learning in both groups after implementation, the total mean scores of self-confidence increased in the flipped classes group compared to the conventional classes group with highly statistically significant difference between two groups. Also, nearly majority of students in the flipped classes group had high confidence level compared to nearly half of students in the conventional classes group.

In the researcher's points of view, the classroom time was utilized to enhance students understanding through discussion with peers and problem-solving actions facilitated by teachers which improved

students' comprehension. Additionally, class time was used to enforce collaborative learning among students as well as offering student-centered practices which improve self-confidence and made students built a more positive mindset towards learning.

Similarly, **Muhibbuddin et al., (2020)** showed a significant difference on self-confidence data between the experimental group and the control group when comparing t-test. Additionally, **Cho et al., (2021)** reported that the student's concentration, motivation, confidence, and satisfaction are more enhanced in a flipped classroom group compared to traditional one. Also, **Arifin et al., (2022)** reported that student's engagement and active participation in learning usually result in increased self-confidence.

These results supported the second study hypothesis which stated that nursing students who use flipped classroom strategy will exhibit higher self-confidence than those who use conventional teaching methods.

Concerning mean score of perception of learning strategy, the total mean scores of perception elevated in the flipped classes group compared to the conventional classes group after implementation with highly statistically significant difference between two groups. Also, more than three quarters of students in the flipped classes group had positive perception compared to two thirds of students in the conventional classes group. This might be due to that in flipped classroom method, the teacher no longer acts as the speaker and conducts all instructional activities; instead, the teacher took on the roles of facilitator, supervisor, and organizer. As a result, students had a sense of responsibility and were able to take part in

interactive learning activities in the classroom.

The above-mentioned results agreed with **Shana & Abdalbaki, (2020)** who showed that most students believe that their attitude towards learning science through flipped classroom strategy is positive. This has been linked to their adoption of a new learning strategy; their higher performance in this subject was a result of this attitude shift in contrast to the students who were subjected to the traditional classroom learning.

Furthermore, **Shana & Alwaely (2021)** demonstrated that most student reactions to the flipped classroom were favorable and conveyed their general happiness with the flipped learning environment. On the other hand, **Chuang et al., (2018)** affirms that flipped classroom does not fit all students.

The above-mentioned results supported the third research hypothesis which stated that nursing students who use flipped classroom strategy will exhibit better perception than those who use conventional teaching methods.

Regarding flipped students' opinions about flipped classrooms strategy after implementation, all students stated that everyone in the group have responsibility, majority of them reported that flipped classrooms were an innovative teaching-learning method that reduced student dependence on the teacher and increased the likelihood that the teacher would be interested in each student.

The above-mentioned results agreed with **Shana & Alwaely (2021)** who reported that ninety-five percent of the participants agreed with the statement that they

appreciated the flipped instruction learning style better than standard education. Additionally, **Say and Yıldırım (2020)** discovered that flipped learning styles provide significantly higher levels of engagement. It naturally offers a structure for candid dialogue between students and their peers as well as between students and teachers.

Furthermore, there is mounting evidence that, in comparison to traditional teaching approaches, team-based learning (TBL), a student-centered but teacher-directed flipped classroom model, increases student satisfaction and engagement with the encouragement of active learning (**Zubair et al.,2022).**

Regarding challenges, the findings of the present study, more than three quarters of the studied students reported the following challenges: feeling of being stressed with the amount of responsibility would have to hold in, difficulty in learning if there is no internet access or computer. While less than two thirds of them reported the following challenges: requirements for technology may increase costs. and flipped classroom includes a heavy reliance on student motivation by the lecturer are of the most reported challenges student faced while applying the flipped classroom strategy.

It was illustrated that (79.8%), (78.6%), (61.3%) and (58.9%) of the flipped classrooms students reported the following challenges: feeling of being burdened with the amount of responsibility that would need to be maintained, learning would be difficult without a computer or internet connection, and technological requirements could lead to rising costs and flipped classrooms. includes a heavy reliance on student motivation by the lecturer, which is a real challenge; respectively.

The above-mentioned results agreed with **Shana & Alwaely (2021)** who concluded that the amount of responsibility that students would have to bear in this setting could cause them stress. Additionally, **Anjomshoaa et al., (2022)** showed that students reported that (lack of desire to study the material outside of class or to watch the recorded video lectures) is one of the most challenge of using flipped classroom strategy).

Additionally, **Rehman et al., (2020)** reported that one of the challenges that must be taken in considerations while using flipped classroom is the availability of space and strong internet connectivity. Another strategy is that certain students fail to bring the necessary materials for in-person discussions. The "lack of interest" exhibited by certain students is undoubtedly one factor that requires careful consideration.

Furthermore, **Oudbier et al., (2022)** revealed that a negative factor of flipped classroom application is that students prefer more passive explanation because in situations where the concepts are unfamiliar or challenging to comprehend, pupils occasionally fail to pick up the lower-order abilities on their own during extracurricular activities, when the content are new or not easily to understand.

Regarding correlation between total achievement score and total scores of (perception and opinion) in flipped classes group after implementation, there was a highly significant statistical positive correlation between total achievement score and total scores of (perception and opinion) in flipped classes group after implementation. This may be due to when the students accept the method of learning this encourage them to make better achievement. This results agreed

with **Fisher et al. (2021)** who found that was a positive correlation between learners' engagement, performance, and satisfaction.

Conclusion

The findings of current research concluded that the flipped classroom strategy effectively improved academic achievement, self-confidence and perception of nursing students compared to conventional teaching methods as mean scores of flipped and traditional groups regarding academic achievement, self-confidence and perception were significantly higher in flipped classroom group compared to conventional group. Also, the student's opinions reflected that they were highly satisfied with the flipped classroom strategy implementation. This conclusion supported the research hypotheses.

Recommendations:

- Utilization of flipped classroom for nursing courses that can benefit most from flipping by saving class time for the application of necessary skills gained after instruction.
- Pre-training on flipped learning should be given to all students in order to prepare them for its implementation and to demonstrate the advantages of flipped learning in the classroom, which will boost their motivation.
- Technological support for all students is recommended to overcome the predicted challenges during implementation of online based education.

Further researches:

- The flipped classroom could be used in the same classroom for multiple semesters in order to study how long it lasts.
- It is advised to repeat the study using a large representative probability sample to ensure more generalization of the results.

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تأثير استراتيجية الفصول المعكوسة مقابل طرق التدريس التقليدية على التحصيل الأكاديمي والثقة بالنفس والإدراك لدى طلاب التمريض

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الفصول المعكوسة هى أسلوب تعليمي يركز على التعلم النشط للطلاب مع إعادة بناء تقنيات التدريس التقليدية. لذا هدف هذا البحث إلى تقييم تأثير استراتيجية الفصول المعكوسة مقابل طرق التدريس التقليدية على التحصيل الأكاديمي والثقة بالنفس والإدراك لدى طلاب التمريض. كما تم استخدام تصميم بحث شبه تجريبي (مجموعتين ، "الاختبار البعدي فقط") و تم إجراء البحث الحالي بقسم تمريض النساء والتوليد بكلية التمريض جامعة بنها في الفصل الدراسي الأول من العام الجامعي ٢٠٢٣-٢٠٢٤. على عينة غرضية مكونة من ٣٤٥ تمريض في السنة الثالثة . أظهرت النتائج بأن متوسطات الدرجات فيما يتعلق بالتحصيل الأكاديمي والثقة بالنفس والإدراك وجود فرق ذو دلالة إحصائية عالية بين الفصول المعكوسة ومجموعات التدريس التقليدية بعد التنفيذ بقيمة (p<0.001) , كما أظهرت غالبية آراء الطلاب رضاهم الإيجابي عن تنفيذ إستراتيجية الفصل المعكوس. كما خلصت نتائج البحث الحالي إلى أن استراتيجية الفصول الدراسية المعكوسة حسنت بشكل فعال التحصيل الأكاديمي والثقة بالنفس والإدراك لدى طلاب التمريض مقارنة بطرق التدريس التقليدية. واوصت الدراسة بإستخدام الفصول الدراسية المعكوسة في دورات التمريض التي يمكن أن تستفيد أكثر عن طريق توفير الوقت لتطبيق المهارات الضرورية المكتسبة بعد التدريس.