Enhancing Maternity Nursing Students' Cognitive Achievement, Self-Directed Learning and Satisfaction Using Mind Mapping within Flipped Classroom Strategies Compared to Conventional Blended Methods

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Abstract

Background: The shift to active learning in nursing education emphasizes innovative approaches like mind mapping and flipped classrooms, which enhance students' comprehension, retention, and engagement. **Aim:** This study enhances maternity nursing students' cognitive achievement, self-directed learning, and satisfaction using mind mapping within flipped classroom strategies compared to conventional blended methods. **Design:** A quasi-experimental design was used in this study. **Setting:** The research was conducted at the Faculty of Nursing, affiliated with Menoufia University. **Sampling:** The sample consisted of 320 students. **Tools:** Three tools were used to measure outcomes: the self-directed cognitive achievement test, the self-rating scale of self-directed learning, and the student satisfaction and self-confidence in learning scale. **Results:** Baseline measurements showed no significant variations among the two groups, including cognitive achievement, self-directed getting to know, pride, and self-confidence. The experimental organization demonstrated notably higher rankings in cognitive achievement, practical talents, self-directed learning, and student satisfaction versus the standard blended group following the intervention. Thought mapping helped college students prepare and retain records, even as the flipped school room fostered unbiased knowledge of and sensible software. **Conclusion:** Mind mapping and flipped classroom strategies improve maternity nursing college students' cognitive achievement, self-directed learning, and satisfaction versus the standard blended group. This collaborative method promotes deeper getting-to-know and better equips students with the skills needed in clinical exercise. **Recommendations:** Nursing educators adopt mapping and flipped classroom strategies as an effective teaching approach to improve maternity nursing college students' cognitive success, realistic talents, and pride.

Keywords: Cognitive achievement, self-directed learning, and satisfaction with mind mapping in flipped classroom strategies among maternity nursing students.

Introduction

In contemporary nursing education, there was a distinct shift from passive, lecture-based mastering to greater energetic and participatory coaching strategies. This transformation is critical in maternity nursing, in which college students need to develop the most effective, robust theoretical foundation and realistic abilities to achieve medical settings (Chang et al., 2022). Traditional teaching techniques, which include lectures, frequently fail to interact with students in a manner that promotes deep understanding and retention of complex cloth. Innovative strategies like the flipped lecture room and mind mapping have emerged, providing promising options to improve scholarly effects (Chao et al., 2022).

The potential to integrate theoretical knowledge with hands-on capabilities is important, yet conventional teaching tactics may not safely put students together for those demands. Active mastering strategies, which include flipped school rooms, encourage students to engage with the content material more meaningfully. In a flipped study room, college students are delivered new clothes outside class, usually through motion pictures or readings, elegant time know-how through discussions, problem-solving, and hands-on activities. This technique promotes deeper studying and enhances the capacity to switch expertise to real-world exercise (Chu et al., 2019; Nwamu & Ni, 2023).

Mind mapping is a visual mastering tool that facilitates students' information in a way that complements comprehension and retention. It allows college students to create a diagram of interconnected thoughts, supporting them with the relationships among concepts and making it less difficult to recollect facts. In maternity nursing education, wherein students must hold close a huge range of interconnected subjects—from prenatal care to labor and

delivery—thought mapping may be particularly beneficial. By organizing complicated records into clean, visual frameworks, college students can more easily combine and observe their information in scientific eventualities (Helgøy, et al., 2022).

When mind mapping is integrated with the flipped lecture room technique, it creates an effective aggregate that complements cognitive and sensible studying. The flipped study room allows them to interact with foundational fabric at their tempo; mind mapping enables them to prepare and visualize that information. Students can focus on their expertise via discussions, case studies, and practical sporting events. This collaborative knowledge of surroundings encourages essential thinking, trouble-solving, and the development of sensible skills, all of which might be crucial for maternity nursing college students (Chu et al., 2019; Nwamu & Ni, 2023).

Research supports the effectiveness of combining thought mapping with flipped lecture room strategies in nursing education. Studies have proven that those methods are students' cognitive success, self-directed learning, and realistic talents. In maternity nursing specifically, students who use that energy to gain knowledge of strategies display better tires of expertise, retention, scientific competence, and self-belief versus those taught through traditional methods. Additionally, using mind mapping allows college students to see the "large image" of maternity care, making it easier to attach theoretical understanding with sensible utility in medical settings (Wang, 2021 & Zhang, 2022).

In nursing education, mixing innovative teaching techniques like flipped classrooms and mind mapping is crucial for boosting cognitive achievement, sensible talents, and pride in maternity nursing college students (Nugroho et al., 2020; Liu et al., 2022). These methods no longer best promote deeper knowledge and better retention of complicated material but equip college students with the essential thinking and problem-fixing abilities for effective scientific practice. By adopting those techniques, nursing educators can highly prepare students for the challenges of maternity care, ensuring they're confident, capable, and equipped to excel in their roles as future healthcare specialists (Liu et al., 2022).

Significance of the study

The significance of this exam lies in its contribution to enhancing the best of nursing education, particularly in maternity nursing. As nursing curricula hold to adapt, there's a developing want for modern teaching techniques that go past traditional lecture-based mastering. This study addresses the need to explore the mixture of thought mapping and flipped lecture room techniques. Each of these encourages active scholar participation, crucial thinking, and the potential to apply theoretical information in practical settings (Wang, 2021 & Zhang, 2022). The findings are particularly relevant for maternity nursing, where students must develop cognitive understanding and hands-on clinical skills. By demonstrating the effectiveness of these strategies, this study can serve as a model for enhancing educational practices in nursing programs.

Additionally, the look has broader implications for the professional improvement of nursing students. Mind mapping and flipping schools foster self-directed mastery, which is crucial for nurses in a continuously evolving healthcare environment. Nurses must constantly update their information and adapt to new demanding situations in affected person care, particularly in specialized fields like maternity nursing. By selling those active learning techniques, they contribute to lifelong learning habits among nursing students (Charumbira et al., 2022). The potential improvement in student satisfaction, confidence, and learning outcomes also supports these methods in nursing education, ultimately leading to better-prepared graduates capable of delivering high-quality maternity care.

The aim of the study

To enhance maternity nursing students' cognitive achievement, self-directed learning, and satisfaction by using mind mapping in flipped classroom strategies compared to conventional blended methods.

Research hypotheses:

H1: The maternity nursing students in the group using mind mapping within the flipped classroom strategy will have a higher cognitive achievement level than those using conventional blended teaching methods.

H2: The maternity nursing students in the group utilizing mind mapping within the flipped classroom strategy will have a higher self-directed learning level than those using conventional blended methods.

H3: Maternity nursing students who use mind mapping in the flipped classroom strategy will be more satisfied than those who use conventional blended teaching methods.

Operational definition:

Cognitive Achievement: The degree of information or expertise attained with the aid of college students as measured by standardized cognitive checks or checks. In this context, cognitive achievement includes authentic know-how, comprehension, and application competencies that reflect college students' mastery of study method content material. It changed into a self-administered cognitive success.

Practical Skills: The hands-on capabilities demonstrated by using college students to perform specific nursing duties or strategies in a managed or medical setting. Practical abilities are measured through overall performance evaluations and are essential for applying theoretical understanding in actual-world scenarios. It is calculated using the self-rate scale of self-directed learning (SRSSDL).

Satisfaction: The degree to which college students experience content material, are influenced, and have high-quality master reports. This can include their attitudes toward instructional techniques, gaining knowledge of surroundings, and perceived non-public development, often assessed using a scholar pride scale. It measured the device student's delight and self-belief in gaining knowledge of scale (SSL).

Mind Mapping: A visual mastering device that entails growing diagrams to symbolize relationships among principles, facilitating deeper comprehension and retention of records. In this observation, mind mapping is used to assist nursing college students in arranging and combining study technique ideas correctly.

Flipped Classroom Strategies: An instructional technique wherein college students interact with new clothes (including lectures or reading assignments) outside the lecture room, the use of in-class time for hands-on sports, discussions, and sensible utility. This method encourages energetic getting to know and reinforces expertise.

Blended Methods: A teaching approach that combines conventional face-to-face training with online components to enhance flexibility and master outcomes. Blended strategies offer advantages in both physical and virtual environments, greater engagement, and accessibility.

Method

Research Design: A quasi-experimental design was used in this study. The study compared two collaborative teaching approaches: the study institution used a combination of mind mapping and flipped study room strategies; the manipulated institution followed a mixed technique combining conventional flipped lecture room techniques with traditional lectures.

Research Settings: The research was conducted at the Faculty of Nursing, affiliated with Menoufia University.

Sample Type: The maternity nursing students enrolled in the research method direction during the 2023-2024 educational 12 months, 2nd term, agreed to participate in the examination. The sample consisted of 320 college students, divided into 160 through simple random sampling. Group 1 obtained the research method course through mind mapping and flipped classroom strategies, even as Group 2 observed the traditional mixed method, which combined flipped classrooms and lectures. Random undertaking became finished using a random variety of mobile technology software

Sample Size Calculation:

The pattern size was calculated using ClinCalc Statistical Software's two unbiased agencies system, considering a ninety-five percent self-assurance level and eighty percent power. Based on preceding facts from the study using El-Sayed et al. (2023), where Group 1 had a mean of 82.47 (SD = 8.61) and Group 2 had a median of seventy-nine.65 (SD = 16.69), the minimum required pattern length was determined to be 145 college students according to the organization. An extra 10% was introduced to account for capacity dropouts, yielding a final pattern of one hundred and sixty students in every organization.

Data Collection Tools:

Three tools were used for data collection.

Tool I: Self-administered Cognitive Achievement Test.

This test was divided into two sections.

The first part collected personal information about the students, such as age, gender, academic level, GPA, and residence.

The second part assessed cognitive achievement in the research methodology course, covering key concepts, research importance, designs, data collection methods, and research ethics. The questions were adapted from academic sources, such as Charumbira et al. (2022).

Scoring System: Each correct answer earned one point, while incorrect answers received zero. Total scores were classified as high (≥75%), moderate (50-74.9%), and low (<50%) levels based on Amr et al. (2023).

Tool II: Self-Rating Scale of Self-Directed Learning (SRSSDL).

Originally developed by Williamson (2007), this tool consists of 60 items distributed across five domains: learning awareness, strategies, activities, evaluation, and interpersonal skills. It measures students' readiness for self-directed learning in higher education.

Scoring System: A five-point Likert scale from 1 (never) to 5 (always). Scores were classified into low (60-140), moderate (141-220), and high (221-300) self-directed learning levels following Abdelhafez et al. (2020).

Tool III: Student Satisfaction and Self-Confidence in Learning Scale (SSSCL).

Developed by the National League for Nursing and Laerdal Medical (Jeffries & Rizzolo, 2006), this tool consists of 13 items divided into two sections: five items measuring student satisfaction with the teaching method and eight items assessing self-confidence in learning.

Scoring System: The tool utilized a five-point Likert scale, where 0 indicated strong disagreement and 5 indicated strong agreement. Scores were classified as high (68%-100%), moderate (52%-67.9%), and low (20%-51.9%) based on Mohamed & Mohamed (2020).

Validity and reliability of tools:

The study's tools were validated by five experts in the Maternal and Newborn Health Nursing Department and community health nursing to ensure relevance and completeness. A pilot study with 32 students (10% of the total sample) evaluated the clarity and practicality of the tools, with adjustments made accordingly.

Cronbach's alpha values were used to determine reliability, with scores of 0.95, 0.96, and 0.92 for the SSSCL and subscales, indicating excellent reliability. The SRSSDL also demonstrated acceptable reliability with a Cronbach's alpha of 0.78.

Ethical Considerations:

The study received ethical approval from Menoufia University's Nursing Faculty Research Ethics Committee in 2023 number (828). Informed consent was obtained from all participants with assurances that their results would not affect their grades and would only be used for research purposes.

Procedure

Administrative Steps: Official approval for accomplishing the observation was obtained from the Vice Dean for Education and Student Affairs in the Faculty of Nursing, Menoufia University. The approval outlined the take-a-look's targets, tactics, and capability advantages.

Operational Procedure: The look at step forward via 4 distinct levels: assessment, planning, implementation, and evaluation.

Assessment section: The researchers began by welcoming the nursing college students and explaining the study's purpose and method. Each student received a course syllabus detailing the studying desires, schedule, and duties. Using a cell randomizer app, the students were randomly divided into two companies: one hundred sixty students in Study Group 1 and one hundred sixty college students in Study Group 2. Baseline statistics, consisting of personal characteristics, cognitive achievements, and self-directed mastering competencies, were accumulated from each participant through Tools I and II (Ibrahim et al., 2024).

Planning section: Course content material changed into evolved based totally on pre-take a look at results and relevant academic literature. Six topics on study techniques have been selected: essential concepts, the significance and packages of studies, research processes, research designs, statistics series methods, and research ethics.

Study Group 1 taught a mixture of thought mapping and flipped audio/video classes (15-20 mins duration). The researchers prepared introductory PowerPoint presentations on mind

mapping to familiarize the students with this approach.

Study Group 2 received identical content material via a mixed knowledge of technique, which mixed traditional lectures with flipped audio/video sessions. Both agencies have been provided with a PowerPoint presentation on the issues for reference.

Implementation section: This section spans six weeks, with one session each week. Both groups have been taught by the same researcher, and the path content was made available to all college students on a CD before the period.

Study Group 1: Students were dispatched a fifteen-20 minute flipped audio/video via WhatsApp one day before every session. They have been asked to listen to the video, examine the topic material, and create character mind maps. In small organizations of 16, students collaborated to increase a collective thought map, accompanied by a group presentation. After the presentation, comments were furnished by the researcher and friends. At the end of every consultation, Study Group 1 responded to color-coded questions about a cognitive achievement test based on the session content.

Study Group 2: Students in this group obtained flipped audio/video classes via WhatsApp, like Group 1, and attended traditional lectures throughout magnificence time. They have been requested to pay attention to the videos and assess the content material for out-of-magnificence gaining knowledge of activities. After every consultation, they replied to cognitive fulfillment questions, like Study Group 1.

Evaluation section: At the realization of the six-week route, both have a look at businesses and finish a very last cognitive achievement. They additionally crammed out the Self-Rating Scale of Self-Directed Learning to assess their practical talent development in self-directed learning. Additionally, satisfaction and self-confidence in the learning scale were administered to the degree of their pleasure with the teaching methods.

Statistical Analysis: Data was coded and analyzed using SPSS version 25. Descriptive statistics, including central tendency and dispersion, were used to summarize the sample characteristics. The Kolmogorov-Smirnov test was conducted to check for normality. Inferential statistics, including chi-square tests and independent t-tests, were used to evaluate the research hypotheses. The significance level was set at $p < 0.05$.

Results:

　　Table 1 shows the distribution of the students according to their baseline personal characteristics. It shows that there was no statistically significant difference between the two groups regarding the distribution of the students according to their baseline personal characteristics P>0.05.

　　Table 2 shows the mean scores of cognitive achievements before and after the intervention implementation between the two study groups. It shows that there was no statistically significant difference between the two groups regarding the mean scores of cognitive achievements before the intervention implementation (P>0.05); there was a highly statistically significant difference between the two groups regarding the mean scores of cognitive achievements after the intervention implementation (P>0.05).

　　The data in Table 3 shows a significant improvement in the cognitive achievement scores of Study Group 1 after the intervention, as indicated by the p-value (P ≤ 0.001). Study Group 1 had no participants with low post-test scores, and 94.4% of participants achieved high scores, compared to Study Group 2, where 33.1% still had low scores and none reached the high category. This demonstrates the effectiveness of the intervention in enhancing cognitive achievement in Study Group 1.

　　The results of Table 4 indicated substantial improvements in the self-directed learning scores across all subdomains for Study Group 1 after the intervention. This suggests that the intervention was highly effective in enhancing self-directed learning across multiple dimensions for Study Group 1 compared to Study Group 2.

　　The results of the study in Table 5 revealed a significant improvement in self-directed learning scores following the intervention, particularly in Study Group 1. Before the intervention, both groups had a similar distribution of low, moderate, and high self-directed learning levels, with no significant difference between their baseline scores (p=0.245). However, after the intervention, Study Group 1 exhibited a remarkable shift, with 98.8% of participants achieving high SRSSDL scores, compared to only 44.4% in Study Group 2. This difference is statistically significant (p ≤ 0.001), indicating that the intervention had a substantial impact on enhancing self-directed learning in Study Group 1. Conversely, Study Group 2 showed moderate improvements but not as pronounced as Group 1. These findings suggest that the intervention was highly effective in promoting

self-directed learning skills, especially in the first study group.

Table 6 showed that after implementing the intervention, Study Group 1 (n=160) reported significantly higher mean scores in student satisfaction and self-confidence in learning versus Study Group 2. Specifically, the total mean score in Group 1 was 24.60±1.20, while the mean of Group 2 was 21.41±2.91. This difference was statistically significant (t=15.82, P≤0.001). Similarly, for self-confidence, the total mean of Group 1 was 29.21±1.89, compared to 24.00±2.41 in Group 2. This difference was also statistically significant (t=21.92, P≤0.001).

Figure 1 displayed that after implementing the intervention, Study Group 1 reported significantly higher mean scores in student satisfaction and self-confidence in learning versus Study Group 2. Specifically, 100% of students in Group 1 achieved high satisfaction scores, while 81.2% in Group 2 achieved high satisfaction.

Figure 2 displayed that after implementing the intervention, Study Group 1 reported significantly higher mean scores in student satisfaction and self-confidence in learning versus Study Group 2. Similarly, for self-confidence, 98.8% in Group 1 scored high, compared to 86.9% in Group 2.

Table (1): Distribution of the Studied Students According to Their Baseline Personal Characteristics (n=320)

Variables	Study Group 1 (n=160)		Study Group 2 (n=160)		X² & P Value
	No.	%	No.	%	
Age					0.216ns >0.05
18-<20	39	12.2	46	14.4	
20-<22	236	73.8	226	70.6	
≥22	45	14.0	48	15.0	
Mean±SD	21.0± 0.83		20.86±0.85		
Gender					0.234ns >0.05
Female	200	62.5	178	55.6	
Male	120	37.5	142	44.4	
Residence					0.345ns >0.05
Urban	192	60.0	170	53.1	
Rural	128	40.0	150	46.9	
Having Previous Information about Mind Mapping					0.456ns >0.05
No	254	79.4	278	86.9	
Yes	66	20.6	42	13.1	
Having Previous Information about Flipped Classroom Strategies					0.567ns >0.05
No	304	95.0	300	93.8	
Yes	16	5.0	20	6.2	

Table (2): The mean scores of cognitive achievements before and after the intervention implementation between the two study groups (n=320)

Variables	Study Group 1 (n=160)		Study Group 2 (n=160)		t & P Value	
	Before the intervention	After the intervention	Before the intervention	after the intervention	Before the intervention	After the intervention
Basic concepts of research methodology						
M±SD	0.88±0.53	1.04± 0.86	4.26± 0.50	3.03±0.15	t=1.78ns P>0.05	t=46.00** P≤0.001
Importance and uses of research score=(5)						
M±SD	1.34± 0.5	4.64±0.48	1.25±0.51	3.37±0.47	t=1.54ns P>0.05	t=23.65** P≤0.001
Research process score=(7)						
M±SD	5.85± 1.01	3.74± 0.82	6.61± 0.59	2.07±1.23	t=1.67ns P >0.05	t=35.57** P≤0.001
Research designs score=(10)						
M±SD	1.34 ±0.57	4.64±0.48	1.25±0.51	3.37±0.47	t=1.8ns P >0.05	t=30.99** P≤0.001
Different tools and methods of data collection score=(9)						
M±SD	0.43 ± 0.41	2.90 ± 0.97	0.53 ± 0.50	2.53 ±0.50	t=1.79ns P >0.05	t= 4.33** P≤0.001
Ethics of doing research score=(4)						
M±SD	1.39 ±0.93	6.94 ±1.23	1.58 ±0.90	5.22 ±1.44	t=1.83ns P >0.05	t=11.45** P≤0.001

Table (3): The total mean scores of cognitive achievements before and after the intervention implementation between the two study groups (n=320)

Variables	Study Group 1 (n=160)		Study Group 2 (n=160)		X^2 & P Value
	No.	%	No.	%	
Baseline Cognitive Achievement Score (out of 40)					$X^2 = 2.07$ns P >0.05
Low	316	98.8%	314	98.1%	
Moderate	4	1.3%	6	1.9%	
Mean ±SD	8.13 ±3.42		8.56 ±3.67		
Post-Test Cognitive Achievement Score (out of 40)					$X^2 = 40.34$* P ≤ 0.001
Low	0	0%	106	33.1%	
Moderate	18	5.6%	214	66.9%	
High	302	94.4%	0 (0%)	0%	
Mean ±SD	66.45 ±2.14		21.46 ±2.87		

Table (4): The Mean Scores of Self-Directed Learning Before and After the Intervention Implementation between the Two Study Groups

Variables	Study Group 1 (n=160)	Study Group 2 (n=160)	t & P value
Learning Awareness Score (out of 60)			
Before the Intervention	43.06±3.81	43.98±4.80	t = 1.90ns P >0.05
Post-Intervention	52.29±4.30	45.88±6.97	t = 9.90** P ≤ 0.001
Learning Strategies Score (out of 60)			
Before the Intervention	44.76±4.45	45.38±4.80	t= 1.19ns P >0.05
Post-Intervention	49.67±3.68	45.97±4.92	t= 7.61** P ≤ 0.001
Learning Activities Score (out of 60)			
Before the Intervention	44.55±3.68	45.29±4.48	t= 1.62ns P = 0.106
Post-Intervention	50.44±3.18	45.80±4.54	t = 10.65** P ≤ 0.001
Evaluation Score (out of 60)			
Before the Intervention	44.03±5.23	42.98±4.80	t = 1.85ns P >0.05
Post-Intervention	50.66±4.62	43.42±5.13	t= 13.26** P ≤ 0.001
Interpersonal Relationships Score (out of 60)			
Before the Intervention	45.30±4.53	44.48±4.14	t= 1.68ns P >0.05
Post-Intervention	51.67±3.01	44.93±4.41	t= 15.93** P ≤ 0.001

Table (5): The Total Level and Mean Score of Student Satisfaction and Self-Directed Learning Scores Before and After the Intervention Implementation between the Two Study Groups (n=320)

Variables	Study group 1 (n=160)		Study group 2 (n=160)		X^2 & P Value
	No.	**%**	**No.**	**%**	
Total student satisfaction score					X^2 = 1.165ns P > 0.05
Low	5	3.1%	3	1.9%	
Moderate	95	59.4%	96	60.0%	
High	60	37.5%	61	38.1%	
Mean±SD	218.07±22.75		221.08±23.52		
Post-test Self-Directed Learning Score					**X^2= 14.00** P ≤ 0.001**
Moderate	2	1.2%	89	55.6%	
High	158	98.8%	71	44.4%	
Mean (SD)	254.52±11.74		225.96±22.97		

Table (6): The Total Student Satisfaction and Self-Confidence in Learning Mean Scores on the Learning Scale after the Intervention Implementation in the Two Study Groups (n=320)

Variables	Study group 1 (n=160)		Study group 2 (n=160)		t & P Value
	No.	%	No.	%	
Total student satisfaction score					t = 15.82** P ≤ 0.001
Mean±SD	24.60±1.20		21.41±2.91		
Total self-confidence in learning score					**t= 21.92** P ≤ 0.001**
Mean (SD)	29.21±1.89		24.0±2.41		

Figure 1: Total student satisfaction level in the two study groups

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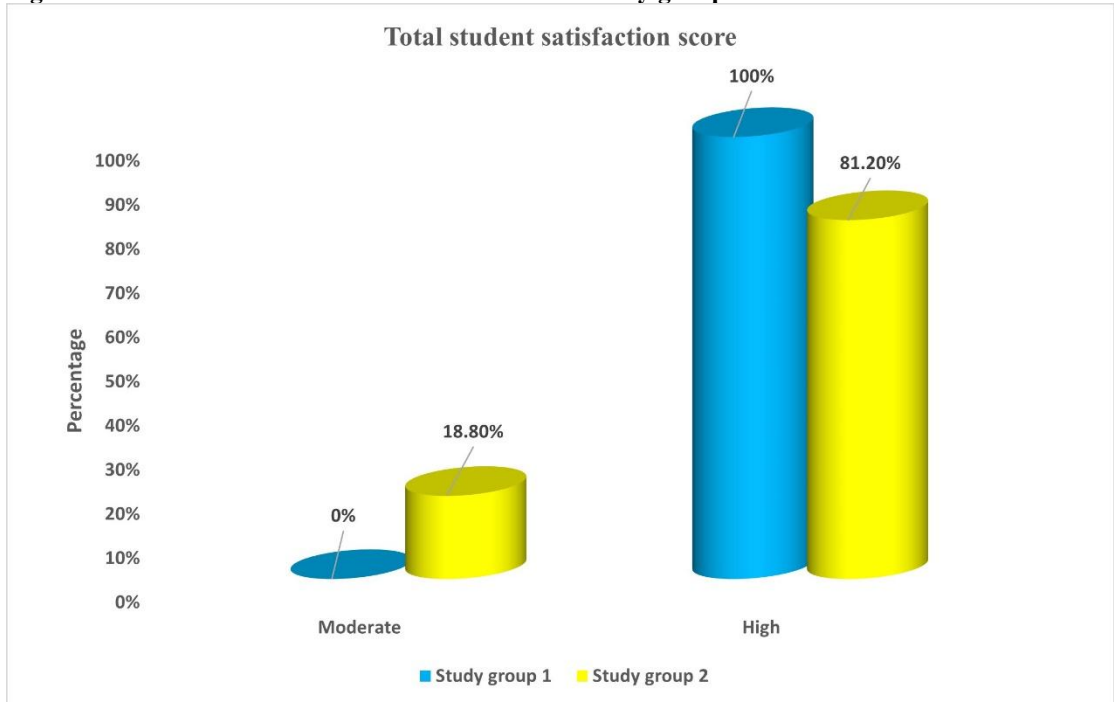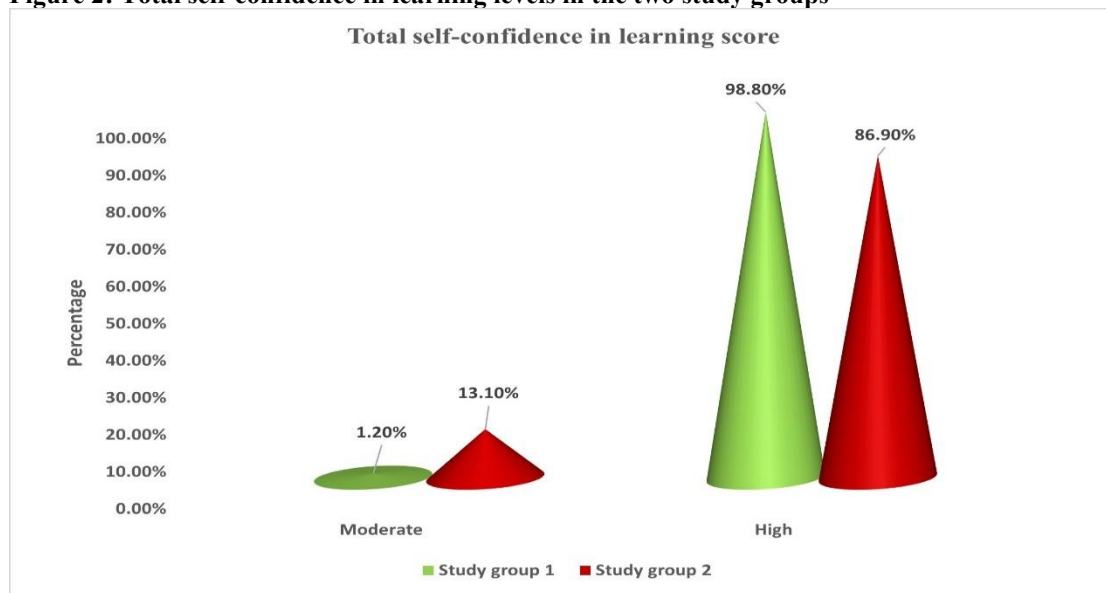
Figure 2: Total self-confidence in learning levels in the two study groups

Discussion:

The discussion of this study focuses on the use of mapping along with flipped lecture room strategies to enhance the cognitive success, realistic skills, and pleasure of maternity nursing college students. The findings recommend that integrating those two energetic mastering strategies presents a tremendous improvement in students' cognitive fulfillment, sensible abilities, and general mastering level.

Mind mapping, as a visible device, organizes and simplifies complicated information, which makes it specifically useful for analyzing and memorizing elaborate medical subjects like study methods. The flipped study room method, which reverses conventional teaching by having students examine new content outdoors in the lecture room (through pre-recorded lectures or reading assignments) and then interact in practical sporting events or discussions inside the lecture room, encourages greater active mastering. Combining these strategies allows college students to consolidate know-how extra effectively, as evidenced by the extensive improvement in the cognitive success scores of the students in group 1 compared to the ones in group 2.

The enormous development in cognitive fulfillment visible in group 1, which used a combination of flipped lecture room and mind mapping, is consistent with preceding research (Zheng et al., 2020; Fan et al., 2022). This research additionally found that combining flipped study rooms with thought mapping promotes a deeper knowledge of content material, complements self-directed getting-to-know, and improves college students' motivation and recognition of the teaching methods. These tremendous effects are attributed to how those techniques encourage students to interact actively with the fabric, analyze and synthesize information, and follow knowledge in practical contexts. As a result, students can see the significant improvement in cognitive achievement seen in group 1, which used a combination of flipped classroom and mind mapping, consistent with previous studies (Zheng et al., 2020; Fan et al., 2022). These studies also found that combining flipped classrooms with mind mapping promotes a deeper understanding of content, enhances self-directed learning, and improves students' motivation and acceptance of the teaching methods. These positive outcomes are attributed to these strategies encouraging students to engage actively with the material, analyze and synthesize information, and apply knowledge in practical contexts. As a result, students can retain and apply their knowledge more effectively than traditional methods.

The results of the present-day look aligned with findings from Fan et al. (2022),

which explored using mind mapping within flipped lecture room techniques in teaching obstetrics and gynecology nursing. Fan et al. Additionally, pronounced stepped forward cognitive effects and realistic abilities among nursing students, mainly important wondering and hassle-solving abilities, which are crucial for nursing practice. Similarly, Zheng et al. (2020) highlighted the improved learning motivation and self-efficacy found in college students exposed to collaborative thought mapping in a flipped classroom environment. These findings underscore the blessings of incorporating both strategies to foster lively and self-directed studying, which is vital in nursing schooling.

Furthermore, this study found that the practical abilities (self-directed learning) of nursing college students advanced drastically through using the blended mind mapping and flipped classroom method. Self-directed learning is a key competency in nursing, as it lets students take responsibility for their gaining knowledge of and development, which is essential for her future scientific exercise. By enticing with thought mapping and flipping lecture room techniques, college students not only effectively improved their expertise in the material but also developed better self-control and organizational competencies, which are critical in both educational and medical settings. This is supported by the findings of Nugroho et al. (2020), who mentioned that thought mapping and flipped classroom strategies enhance students' talents to plan, prepare, and monitor their getting-to-know progress effectively.

Additionally, the findings of the modern observation display excessive degrees of pleasure amongst college students taught thought mapping within flipped schoolroom surroundings. fostered by the flipped classroom model, where students can apply the knowledge, they acquired outside the classroom in a more interactive and collaborative setting. Moreover, mind mapping as a learning tool provides clarity and organization of complex information, making it easier for students to understand and recall the material.

In assessment, the conventional mixed studying technique (organization 2) did not now produce the same stage of development in cognitive success or practical talents, as indicated with the aid of the decreased submit-check scores. While flipped study room strategies on my own do offer some advantages over traditional lecture-based totally techniques, the addition of thought mapping complements these benefits by helping college students visualize and shape their understanding more successfully. This emphasizes the significance of using diverse and interactive teaching techniques in nursing education to develop both cognitive and realistic competencies

The cutting-edge exam focused on improving cognitive fulfillment, realistic talents, and pride of maternity nursing students via using thought mapping inside flipped study techniques. The findings found a large improvement in college students' cognitive outcomes, practical self-directed studying abilities, and standard pride, demonstrating the efficacy of mixing these active mastering strategies.

Cognitive Achievement

A major contributing element to the noted increase in students' cognitive success was the new integration of mind mapping with the flipped classroom methodology. Students were able to interact with the material more fully because of mind mapping's visual organization of complicated knowledge. With its emphasis on learning outside of the classroom, the flipped classroom approach gave students the freedom to absorb knowledge at their own speed. Together, these techniques created an engaging learning atmosphere where students actively participated in creating and disseminating knowledge rather than just consuming it. The notable increase in cognitive success scores among students in group 1 as opposed to group 2 was probably caused by this involvement. These outcomes concur with Zheng et al.'s (2020) findings, which showed that the combination of students had better learning outcomes because of collaborative mind mapping and flipped classroom techniques. This conclusion is further supported by recent research by Sari et al. (2023), which highlights how using mind maps in a flipped classroom setting improves learning outcomes, critical thinking, and student motivation. Further supporting the beneficial effects of these approaches on learning outcomes in a range of educational

situations, including nursing education, are studies by Lin & Mubarok (2021) and Liu et al. (2022).

Self-Directed Learning Skills

The study also showed that students in the group that employed mind mapping and flipped classroom techniques significantly improved their ability to learn on their own. Students had more time to watch flipped videos thanks to the flipped classroom format, and mind mapping enabled them to combine and arrange their knowledge into a logical framework. This process encouraged self-directed learning, creativity, and critical thinking, all of which are critical skills for nursing students. The findings demonstrated that the combination of these instructional strategies was more successful in promoting independent learning, with students in Group 1 having a higher mean score for self-directed learning skills than students in Group 2. These results are in line with those of Liu et al. (2022), who highlighted how participants' capacity for independent learning may be greatly enhanced by integrating mind-mapping techniques with flipped classrooms. According to comparable findings by Fidan (2023), Tejeswini et al. (2022), and Diningrat & Ngussa (2022), employing these techniques assisted students in acquiring abilities for lifetime learning, allowing them to think critically, methodically, and creatively. These abilities are essential in nursing school, as students need to be able to use their academic knowledge in practical clinical settings. Student satisfaction and self-confidence: The study indicated that students in group 1, who utilized mind mapping and flipped classroom methodologies, expressed higher levels of pleasure and self-confidence compared to group 2, which used standard blended learning approaches. Drawing mind maps by hand required active engagement, which probably improved critical thinking and self-confidence and increased overall happiness. Self-confidence, which is crucial in nursing practice, has improved, indicating that this approach empowers students to take charge of their education and boosts their feeling of competence. Fan et al. (2022), who found that nursing students who used mind maps in a flipped classroom in obstetrics and gynecology nursing expressed more satisfaction than those who used conventional techniques, corroborate

this conclusion. Elasrag & Elsabagh (2020) also made important discoveries that after using mind mapping, pupils' levels of self-confidence varied significantly. Israel (2019), who found that physician assistant students who used mind maps had more self-confidence than those who used conventional note-taking techniques, further supports the findings. Additionally, Huang (2020) discovered that students had good sentiments regarding collaborative mind mapping as a teaching method and were quite happy with it.

Student satisfaction and self-confidence

The study indicated that students in group 1 who utilized mind mapping and flipped classroom methodologies expressed higher levels of pleasure and self-confidence versus group 2, which used standard blended learning approaches. Drawing mind maps by hand required active engagement, which probably improved critical thinking and self-confidence and increased overall happiness. Self-confidence, which is crucial in nursing practice, has improved, indicating that this approach empowers students to take charge of their education and boosts their feeling of competence.

Fan et al. (2022) found that nursing students who used mind maps in a flipped classroom in obstetrics and gynecology nursing expressed more satisfaction than those who used conventional techniques, corroborating this conclusion. Elasrag & Elsabagh (2020) also made important discoveries that after using mind mapping, pupils' levels of self-confidence varied significantly. Israel (2019), who found that physician assistant students who used mind maps had more self-confidence than those who used conventional note-taking techniques, further supports the findings. Additionally, Huang (2020) discovered that students had good sentiments regarding collaborative mind mapping as a teaching method and were quite happy with it.

Conclusion:

In conclusion, the study revealed that combining mind mapping and flipped classroom strategies significantly improves cognitive achievement, self-directed learning skills, and satisfaction of maternity nursing students. The study also found that students using mind mapping showed higher

cognitive achievement versus traditional blended learning, improved self-directed learning skills, and higher satisfaction and self-confidence in their learning experiences.

Recommendations:

- Explore the long-term effects of these strategies on clinical performance and the potential for scaling them across different educational disciplines.

- Integrate mind mapping in the curriculum: Educational institutions must comprise mind mapping inside flipped classroom techniques in maternity nursing programs to decorate college students' cognitive success, practical talents, and delight.

- Maternity nursing packages should emphasize energetic knowledge gained via collaborative thought-mapping sports, permitting college students to enhance critical questioning, trouble-fixing, and realistic talents

Further research:

• Conduct long-term period studies to assess the sustained effect of thought mapping inside flipped classroom techniques on maternity nursing college students' instructional and medical performance.

• Compare the effectiveness of thought mapping with different active getting-to-know strategies, consisting of case-primarily based getting-to-know or simulation, in enhancing cognitive achievement and realistic abilities.

• Expand research to include students from different nursing specialties and global cohorts to look at the generalizability of thought-mapping blessings throughout various educational settings.

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