

# Flipped Classroom Learning Experiences of Graduate Nursing Students in Advanced Pathophysiology and Pharmacology in Midwifery Course

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## Abstract

**Background:** Flipped classroom is designed as an educational innovation in order to enhance student's critical thinking and problem-solving skill. It comprises in-class and out-of-class learning activities.

**Purpose:** To describe students' learning experiences of the flipped classroom activities, supporting learning environments and barriers to learning out comes.

**Methodology:** Descriptive qualitative research was employed. Participants were seven first year graduate nursing students enrolled in the Advanced Pathophysiology and Pharmacology in Midwifery course. Three main active learning activities were: 1) participating in before class activities, 2) Practicing in class activities, and 3) checking understanding and extending after class learning outcomes.

**Results:** Students who learned using a flipped classroom approach had positive experiences, achieved learning outcomes, and were satisfied with case analysis activities. Supporting learning environments were appropriate handouts, adequacy of learning materials, active involvement, interesting case study, and prior knowledge and experiences. Learning barriers were too much class work and activities in all courses and printed documents in English language.

**Conclusion:** The flipped classroom was effective to enhance students' competencies in application of theoretical knowledge, critical thinking, and problem solving skill. It should be utilized in nursing education with a well-designed and well-prepared scheme to flip the class in appropriate courses.

**Keywords:** *Flipped classroom, active learning, graduate nursing students.*

## Introduction

The flipped classroom has been proposed as an educational innovation for teaching method instead of traditional lecture. It comprises of in-class and out-of-class learning activities. Educators can design a variety active learning approaches including sources of

theoretical content prepared for studying before class, effective class participation, and promotion of extended application of knowledge after class. The main purpose of flipped classroom strategy is to motivate students to transform from being passive learners to be more active and self-directed learners.<sup>1</sup> Then, flipping the classroom offers a new and interesting approach that can be applied in various courses.

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Some research has provided evidence of the effectiveness of the flipped classroom in enhancing students' learning outcomes. In medical education, students engaged in the flipped learning activities demonstrated higher problem-solving skills and longer

knowledge retention.<sup>2</sup> In addition, participation in the flipped group-working results in improved application of new idea to design innovative project and enhanced critical thinking and academic argument skill.<sup>3</sup> Moreover, implementation of the flipped classroom can support students' self-directed learning to achieve lifelong learning promotion.<sup>4</sup> Students also favor participation in the flipped classroom through small group discussion and case –based study rather than traditional lectures<sup>5</sup>.

Prior research revealed that implementation of the flipped classroom can promote students' engagement in learning activities, improve understanding of theoretical contents and enhance expected learning outcomes. However, modification of its teaching and learning approach is in transition. Some students are comfortable with the traditional lecture class, while others are satisfied with active learner competency in the flipped classroom.<sup>6</sup> Appropriate model and teaching method to flip each course should be explored and evaluated. Little is known about the effectiveness of teaching and learning activities using the flipped classroom in graduate nursing education. Therefore, this study was designed to examine application of the flipped classroom in advanced pathophysiology and pharmacology in a midwifery course.

**Research Methodology:** In this study, descriptive qualitative research was conducted to investigate learning experiences, supporting environment for the flipped classroom and barriers to engage in the flipped activities. The study setting was the Faculty of Nursing, Prince of Songkla University, Thailand. Participants were seven graduate nursing students enrolled in the advanced Pathophysiology and Pharmacology in Midwifery course during the first semester of 2019 academic year. This project was approved by the Research and Ethics Committee of the Center for Social and Behavioral Sciences Institutional Review Board, Prince of Songkla University.

Implementation of the flipped classroom in this course was designed to include six sessions of the topic pregnancy complicated with medical diseases. Teaching and learning method comprised pre-class preparation, in-class activities, and after-class reports. For each class session, handouts including topics, learning objectives and expected learning outcomes, summary of contents, example of case studies, and videos were provided for the students at least 7 days in advance of class time. Moreover, related media were uploaded on the Learning

Management System (LMS2@PSU). The students could access these learning materials online. In addition, they were advised to search and prepare supplementary resources before starting class. During in-class activities, the leader of each group of students conducted case study analysis and encouraged discussion using critical thinking and active learning process. Educators gave guidance and feedback on learned contents and achieved learning outcomes. In after-class activities, reports of case study analysis were revised and submitted for scoring and grading.

Data were collected using semi-structured interview guides. After complete implementation of the flipped classroom course, the students were asked to give in-depth interviews about their learning experiences, perceived supporting environment and barriers to success and satisfaction. Qualitative content analysis was employed to explore and synthesize the themes emerging from the findings.

**Findings:** The graduate nursing students participated in the flipped classroom activities in this course showed active involvement in pre-class activities, in-class activities, and after-class activities. Three themes of the flipped learning experiences were: 1) active preparing before class activities, 2) enjoying participation in in-class activities, and being satisfied with after-class outcomes.

Active preparing before class activities. The students had read the provided learning worksheets and had accessed online media. In addition, they prepared additional book chapter, articles and research evidence to support case study analysis and presentation. The student's experience was supported.

After knowing my assignment, cardiac disease in pregnant women. I read handout, topic objectives, and recommended reading. Then, I selected a case study from my experience to present in class. I also searched book chapters, journal articles and youtube videos. I planned to lead my case study discussion and asked for suggestions. (Student D).

Enjoying participation in class activities. During in-class activities, each group of students reported that they enjoyed participating in critical thinking, discussion, oral presentation, and sharing their learning experiences. Additional perceptions were reported:

I had experience in caring for a pregnant woman with

GDM. She had been admitted because of high levels of blood glucose, 250 mg/dL, and manifestation of diabetic ketoacidosis. This case was interesting because DKA is a rare complication in pregnant women. I was curious to understand its pathophysiology and to compare it with theoretical knowledge. I searched many papers in order to explain and support my presentation of case analysis. My friends and I had learned from a real case. I had fun with this in-class learning. (Student A).

During after-class activities, nursing students were responsible for summarizing and submitting the case study report on time. In addition, they stated their satisfaction with the designed flipped classroom activities in this course. Student's perception was supportive.

I intend to do my best in presentation of case study analysis. My topic was preeclampsia in pregnant women. I prepared and read many papers in order to understand its pathophysiology. My classmates were willing to participate in discussion because most of them were familiar with this disease. After presenting, I summarized a case discussion and prepared a report to submit on time. My friends and I were satisfied with these learning experiences. We had learned and could understand the provided case. (Student B)

Perceived support for the flipped learning environments included that for: 1) appropriate handouts, 2) adequacy of learning materials, 3) interesting case study, 4) active involvement, and 5) prior knowledge and experiences. Students expressed their perceptions about learning environments that were offered to support the flipped classroom as follows:

My teacher told us about the flipped classroom preparation on orientation day. Then, we had topic handouts, objective of case analysis, and some suggested reading and references. We could search for additional book chapters and articles in the libraries and online databases at PSU central library, medical library, and nursing library. Selected case studies were interesting because they were common problems or high risk conditions that affected maternal and child health outcomes. On presentation day, my friends actively participated in discussion and gave additional examples of cases from their own experiences. Moreover, we had clinical experiences in caring for pregnant women with these pathophysiological conditions. Therefore, we could present and learn in class together. (Student C, D and E).

However, there were some barriers encountered in the flipped classroom that included 1) much course work, and 2) documents in English language. The students' reflections were addressed.

The flipped classroom was our new approach. We usually preferred to have lecture in class. In this semester, we were assigned to do many learning activities in order to achieve expected learning outcomes. We had limited time to spend for each subject and topic. In addition, book chapters and articles required for using in class discussion and report were printed in English, which took more time to read and get understanding. Some of us were not good in English, therefore it was difficult to flip the class in unfamiliar topics. (Students F and G).

## **Discussion**

The study found that application of a flipped classroom in advanced pathophysiology and pharmacology class is more effective than traditional lectures in improving critical thinking and utilizing theoretical knowledge in case analysis. Satisfying and enjoyable engagement in the flipped classroom activities could be achieved if the students were informed about the purpose, rationale, and the benefits of this approach.<sup>7</sup> The students were active in preparing before-class activities as assigned because they understood the philosophy and requirements of the flipped classroom.<sup>8</sup> During implementation of in-class activities, all students should learn to use critical thinking skill to analyze and discuss the case study, and give suggestions to the class. This competency could be achieved because they received learned contents from a variety forms and sources.<sup>8</sup> Therefore, the leaders of each group could integrate their prior knowledge and experiences with the new concepts and learning approach.<sup>9</sup> As a result, the students were satisfied with their active involvement in the flipped classroom activities and learning outcomes. These learning experiences and competencies could cultivate their further lifelong learning motivation.<sup>10</sup>

These positive learning experiences in the flipped classroom were achieved because many supporting facilities and resources were prepared and offered in both before-class and in-class management. First, the philosophy and principles of teaching and learning in the flipped classroom model should be communicated to the educators and students.<sup>11</sup> Then, appropriate handouts should be included learning objectives, summary of learned contents, and suggested readings were outlined

and distributed to the students. Third, adequacy of learning materials and resources including examples of case study, book chapters, journal articles, videos, and related media should be provided and recommended. Therefore, the students could pay attention on in-class activities and focus on the expected learning outcomes of the course.<sup>12</sup> Having active involvement in the flipped classroom activities among classmates creates a supporting learning environment. Engagement and commitment to participation in the flipped classroom learning activities are considered to be students' autonomous responsibility that could enhance their self-directed learning competencies.<sup>12</sup> Fourth, interesting case study and other learning activities should be prepared in advance in order to allow adjustment or modification for appropriateness. Effective management of learning environments could create friendly, creative and comfortable situation.<sup>13</sup> Fifth, students' prior knowledge and experiences are essential background to support the flow of critical thinking and suggestions.<sup>14,15</sup>

Lastly, some learning barriers occurred during implementation of the flipped classroom in this course that included so many learning activities and limited English skills. The students perceived that they had a large amount of paper work and many class activities in all courses in this semester to which they had to pay attention and spend much time. This high workload resulted in 2 of 7 students experiencing exhaustion at the end of the semester. Another concern was the poor English skills. The students were assigned and recommended to read book chapters and journal articles printed in English. None of the students had passed the Prince of Songkla University Test of English Proficiency (PSU-TEP) in the first semester. They planned to register for the English class to improve their critical reading and other skills in the following semester.

### Conclusion

The flipped classroom was implemented in the advanced Pathophysiology and Pharmacology in Midwifery course during the first semester of 2019 academic year. The students were active enjoyed and satisfied with before-class, in-class, and after-class activities. Expected learning outcomes were achieved because positively supporting learning environments were provided and administered in advance. However, some learning barriers were of concern these included many assigned learning activities in all courses and difficulty to do critical reading of English language

materials. The findings reveal and support the effectiveness of the application of the flipped classroom in graduate nursing education.

**Conflict of Interest:** Nil

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**Ethical Approval:** Ethical approval was taken from Center for Social and Behavioral Sciences Institutional Review Board, Prince of Songkla University, Hat Yai, Thailand.

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