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Cultivating Perceived Self Efficacy Through a Flipped Classroom Approach to Teaching and Learning

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Abstract

Background: In the past, nursing classes involved the traditional passive lecture. Today, with the implementation of interactive student centered learning, there is such potential for transformation of the learning environment. Using the Flipped Classroom approach, students can move beyond the traditional lecture, engage in active learning experiences which promote deeper learning, and engage in collaboration with peers.

Aim: The aim of the study was to evaluate a flipped classroom experience and assess student's perceived self-efficacy.

Method: A mixed method research approach was used over three semesters with a group of 163 senior nursing students to examine the effect of the flipped classroom on student's perceived self-efficacy and to evaluate student perceptions of the flipped classroom as a teaching and learning strategy.

Results: The research revealed the flipped classroom approach improved student's perceived self-efficacy and students had a positive perception of the flipped classroom approach to teaching and learning.

Conclusion: The research findings support the idea that the flipped classroom is an active teaching strategy that fosters improvement of self-efficacy and student perceptions of higher academic success.

Keywords: Flipped Classroom; General Self-Efficacy; Learning Styles; Undergraduate Education

Background

In the past, nurse educators have facilitated lecture with minimal integration of technology and active teaching strategies. Lecture was the traditional method of learning and typically involved students coming to class, passively listening to lecture, taking notes, and leaving the learning environment with minimal hands-on activities requiring application of learned content. Research demonstrates that implementation of the flipped classroom reveals potential for profound and significant learning. Students can move beyond the traditional lecture, engage in active learning experiences which promote deeper learning, and collaborate with peers. This strategy affords students the opportunity to apply learned content in a non-threatening, safe and creative learning environment. The purpose of this study was to evaluate a flipped classroom experience and assess student's perceived self-efficacy.

Literature Review

Flipping the classroom involves radical transformation of the learning environment. At the time of this study, there was a paucity of research related to the use of the flipped classroom approach and perceived self-efficacy in nursing education. For nurse educators to be confident in the use of this approach more studies would need to be conducted such as meta-analysis and systematic reviews.

With the flipped classroom approach a shift occurs from the "Sage on the stage", instructor led method of instruction to a format where the students are accountable for listening or

watching lectures before arriving for class. Ideally, students will arrive to class with foundational knowledge of content from pre-class assignments and "Ready to immediately discuss a topic [1].

Schlairet and Benton (2014) convey the belief that faculty should eliminate the traditional face to face lecture and create learning environments conducive to reciprocal teaching and learning [2]. The idea is that implementation of these strategies lead to more student engagement and learning. Specific to the discipline of nursing, this methodology can be advantageous by providing more hands-on learning experiences in the classroom, in simulated learning experiences and in the clinical learning environment. Fostering self-directed, active learning experiences assist in preparing future nurses with the necessary knowledge, skills and abilities for real world application. When flipping the classroom, students become accountable for learning before, during and after class. This provides opportunities for deeper thinking and reflection as "Students must become independent, self-directed learners capable of critical thinking and clinical decision making" [2]. According to Schlairet and Benton (2014), [2] the traditional classroom, while fostering learning, leads to more student "Dependence rather than independent, self-directed learning that promotes critical thinking." Today's complex healthcare environment requires nurses to problem solve and make effective clinical decisions in a timely manner. Thus, the attributes of the flipped classroom design facilitate successful problem solving and effective clinical decision making in a safe, nurturing environment prior to the real world application of those skills.

According to Burden and Siktberg (2015), [3] many nursing programs are embracing the use of the flipped classroom. They examined strategies used over a two-year period in a psychiatric-mental health-nursing course. Students were required to complete online content before arriving at the flipped classroom for eight four-hour sessions in the face to face classroom. The findings of the study revealed that students had to use diverse technology tools to augment the learning experience while accessing their peer folders, which facilitated collaboration with the group. The pre work for this flipped classroom learning experience led to students engaging in virtual clinical assessments which facilitated confidence and proficiency in the clinical learning environment [3]. The desired outcome is to cultivate students who possess higher order thinking skills, creative problem solving abilities and innovative approaches to patient care in the clinical practice setting.

AlJaser (2017) implemented an experimental study to measure the effectiveness of using the flipped classroom to measure academic achievement and self-efficacy among female students in the college of education [4]. In the study, students were in an experimental and a control group. The experimental group was taught in a flipped classroom strategy while the control group was taught traditionally. The findings revealed the experimental group outperformed the control group in post achievement testing and there was positive correlation between the students' attitudes towards the self-efficacy scale. There was a direct correlation between higher scores on achievement test and perceived self-efficacy.

Ibrahim and Callaway (2014) conducted a study to investigate the implications of the flipped teaching strategy on students' perception of self-efficacy to successfully integrate technology [5]. The results indicated students' self-efficacy perception was significantly improved after engaging in the flipped classroom teaching strategy compared to their self-efficacy perception after lecture based content. The interpretation of this result was that flipped teaching promotes cognitive engagement therefore facilitating improved self-efficacy perception. Self-efficacy was revealed in the fact that students' believed they could achieve essential skills.

The Process, Study Setting & Population

This study was conducted at a small rural university in the southeast United States. The course was a 5th semester transition to practice nursing class. Students were recruited as a cohort sample. Inclusion criteria were students actively enrolled in the course, exclusion criteria were students who were not enrolled in the course. Students were given the opportunity to decline participation in the study without consequence. In Spring 2015, Summer 2015, and Spring 2016, a total of one hundred sixty-three students voluntarily participated in the flipped classroom research. Demographics for these cohorts included: student age from 20-49 years, 14% were male and 86% were female, and self-reported ethnicity was Caucasian (85%), Black (11%), Hispanic (2%), American Indian (1%), and Mixed (1%).

The class was taught in the flipped classroom approach using pre-work, in-class learning pods, and peer presentations. The benefits of the flipped classroom included: increased student preparedness, responsibility, and engagement; students could work at their own pace, and it fostered engaged and motivated students. Some challenges reported included: increased faculty workload and the time commitment prior to class for students as well as that the flipped approach often relied heavily on technology [6]. The pre-work activities for the flipped class included completion of: The Institute for Health Improvement (IHI) Modules on Patient Safety (PS)105 entitled, communicating with Patients After Adverse Events, Quality Improvement (QI) 101 entitled, Fundamentals of Improvement, and Patient & Family Centered Care (PFC) 101 entitled, Dignity and Respect; a faculty created Problem Solver Worksheet (PSW); and Assessment Technologies Institute (ATI) Leader Case Studies 1-5.

The "Flipped Out" classroom day included rotation to four learning pods facilitated by four nursing faculty. Students rotated

through each learning pod switching every hour. There were four learning pods which focused on the role of the staff nurse, charge nurse, nurse manager, and a final pod for student presentations of the Problem Solver Worksheet and peer group discussion. A class map is provided in Table 1 explaining the concepts included in each of the learning pods. During the hour the students were in a specific station, completing various learning activities specific to that learning pod. For example, in the nurse manager learning pod; students completed an incident report, a disciplinary action form on a subordinate, conflict resolution and communication case studies, and an exercise on Fulltime Equivalent (FTE's) and scheduling.

Learning Pod	Concepts
Learning Pod 1 The Role of the Staff Nurse	Policies & Procedures Transcribing Orders SBAR Communication Scenarios 2-Challenge Rule CUS for Patient Safety
Learning Pod 2 The Role of the Charge Nurse	Core Measures Delegation Making Patient Assignments Models of Care
Learning Pod 3 The Role of the Nurse Manager	Decision Making Conflict Resolution Sentinel/Never Events Incident Reporting Disciplinary Action Scheduling
Learning Pod 4 What Would You Do?	Problem Solver Worksheet (PSW) • Identify an issue observed in the clinical practicum setting area that could impact patient outcomes. Discuss this issue. • Review the hospital policy regarding this issue, research the best practices, and a scholarly article regarding the issue. • Summarize the hospital policy, best practice guidelines, and the scholarly article. Discuss whether the hospital adheres to or deviates from best practices. • Discuss the simplest solution to the problem based on best practices. Use the research for support. • Provide a bulleted listing of best practice recommendations. • Describe how the implementation of best practices could impact the organization, the team, and the patient. • Explain how you as a practicing nurse could play a vital role in resolving the issue? • What support would you need for hospital administration? Presentation of the PSW to small peer group Questions and discussion

Table 1: Flipped Class Map of Learning Pods.

Methods, Data Collection & Instrumentation

A mixed method study which included both quantitative and qualitative data was conducted. During the quantitative data collection process the General Self-Efficacy Scale (GSE) was used to assess the following question: Does a flipped classroom approach to teaching and learning improve a student's perceived self-efficacy? Data was also collected on demographics and learning style. The intervention in this case was the Flipped Classroom, the dependent variable was perceived self-efficacy, and the independent variables were gender, age, ethnicity, and learning style. The researchers did not manipulate the independent variables and there were no control or comparison groups. The researchers also collected qualitative data which included, conducting a Focused Group Interview and Semi-Structured Questions. Institutional Review Board (IRB) approval was obtained from the university. Subjects were given a detailed written summary of the study and gave informed consent to participate by signing a written permission form to participate in the research study.

The mixed method study involved collection of both qualitative and quantitative data. The quantitative study data included demographics, general self-efficacy scale, and learning style inventory. Qualitative data collected included focus group interviews and semi-structured questions. The Quantitative Data included the General Self-Efficacy Scale (GSE), demographic data, as well as a VARK Learning Styles Inventory. Ralf Schwarzer & Matthias Jerusalem created the GSE in 1995. The scale is designed for use in the general adult population. Perceived self-efficacy is an operative construct, i.e., it is related to subsequent behavior and, therefore, is relevant for clinical practice and behavior change. Cronbach's alphas ranged from .76 to .90, with the majority in the high .80s. The GSE scale is unidimensional. The demographic data survey was developed by the course faculty and included questions based on gender, age, and ethnicity. The VARK Learning Styles Inventory was initially developed in 1987 by Neil Fleming, Christchurch, New Zealand. This questionnaire identifies preferred learning styles. The students were asked to take the Learning Styles Inventory online, record their individual learning style results, and provide the information to course faculty for use in the actual research.

The Qualitative Data included the Focus Group Interview and the Semi-Structured Questions. In the focus group interview, each student was asked the question: What is Your Perception of the Flipped Classroom Approach to Teaching & Learning? With the Semi-Structured Questions all students were asked the following eleven questions:

1. Describe how the flipped classroom facilitated a culture of teamwork and collaboration among your peer group.
2. Discuss how the facilitator's role impacted the learning environment in the flipped classroom.
3. Convey how the flipped classroom approach facilitated your problem solving abilities.
4. Describe how the flipped classroom approach fostered decision making.
5. Explain the level of preparation/effort required in the flipped classroom compared to a traditional class.
6. Which of the key elements of the pre-work did you find beneficial in preparing you for the activities in the learning pods?
7. What was your favorite experience in the flipped classroom?
8. What was your least favorite experience in the flipped classroom?
9. How confident did you feel about the course material after completing the pre-work before coming to the flipped classroom?
10. How confident did you feel about the course material after completing the flipped classroom?
11. Based on your preferred learning style, which teaching strategies used in the flipped classroom enhanced learning of course material?

Results

The study had several limitations that must be considered when interpreting the results. Potential for bias could be a risk associated with the use of convenience sampling; however, this did not seem to be an issue in this research. There were geographic limitations related to the research study being conducted in a department of nursing in a rural area. There was no control group because the researchers did not want to withhold the flipped classroom experience from any student.

Quantitative Data

Table 2 illustrates the GSE results both pre and post the flipped classroom. Using the One-Sample T-Test; researchers measured each of the 10 GSE Questions pre-flipped learning pods and post-flipped learning pods. There was a significant increase for each of the GSE measures overall (P value = 0.000).

Variable	N	Mean	St Dev	SE Mean	95% 95% CI	T	P
GSE Difference 1	163	0.1718	0.4918	0.0385	0.0957, 0.2479	4.46	0
GSE Difference 2	163	0.3374	0.6594	0.0516	0.2354, 0.4394	6.53	0
GSE Difference 3	163	0.1963	0.5865	0.0459	0.1056, 0.287	4.27	0
GSE Difference 4	163	0.2209	0.6481	0.0508	0.1206,0.3211	4.35	0
GSE Difference 5	163	0.319	0.5523	0.0433	0.2336, 0.4044	7.37	0
GSE Difference 6	163	0.1595	0.5435	0.0426	0.0754, 0.2436	3.75	0
GSE Difference 7	163	0.2086	0.6427	0.0503	0.1092, 0.308	4.14	0
GSE Difference 8	163	0.2645	0.5977	0.0468	0.202, 0.3869	6.29	0
GSE Difference 9	163	0.2577	0.551	0.0432	0.1724, 0.3429	5.97	0
GSE Difference 10	163	0.1534	0.4917	0.0385	0.0773, 0.2294	3.98	0

Table 2: One-Sample T GSE Differences Test of $\mu = 0$ vs $\neq 0$.

Tables 3 and 4 reveal the results of the GSE findings relevant to learning style. Only GSE questions three and eight were significantly different relative to learning style. Table 3 demonstrated that multimodal learners had a greater increase in their GSE score on question three post-flipped classroom.

Two-sample T for GSE Difference 3.

Learning Style 2	N	Mean	St Dev	SE Mean
Multimodal	109	0.275	0.607	0.058
Single	54	0.037	0.513	0.07

Difference = μ (Multimodal) - μ (Single)
Estimate for difference: 0.2382
95% CI for difference: (0.0585, 0.4179)
T-Test of difference = 0 (vs ≠): T-Value = 2.62 P-Value = 0.010
DF = 123

Table 3: Two-Sample T-Test and CI for each GSE Question by Learning Style.

Table 4 demonstrated that multimodal learners had a greater increase in their GSE score on question eight post-flipped classroom.

Two-sample T for GSE Difference 8.

Learning Style 2	N	Mean	St Dev	SE Mean
Multimodal	109	0.385	0.592	0.057
Single	54	0.111	0.572	0.078

Difference = μ (Multimodal) - μ (Single)
Estimate for difference: 0.2742
95% CI for difference: (0.0834, 0.4650)
T-Test of difference = 0 (vs ≠): T-Value = 2.85 P-Value = 0.005 DF = 109

Table 4: Two-Sample T-Test and CI for each GSE Question by Learning Style.

Qualitative Data

In Spring 2015 (n=52), Summer 2015 (n=59), and Spring 2016 (n=52), a total of one hundred sixty-three students voluntarily participated in focused group interview and semi-structured questions. The focus group interview question was, what is Your Perception of the Flipped Classroom Approach to Teaching & Learning? The themes that arose from student comments included that the flipped class approach: fostered engagement, built leadership and critical thinking skills, facilitated teamwork and collaboration, assisted with problem solving and decision making, promoted an interactive learning environment, exposed students to information not covered elsewhere in the curriculum, assisted with delegation and prioritization, encouraged dialogue and debate, improved self-confidence, was fun, kept students focused, was interesting and challenging, and offered many different opportunities to learn. Many students cited enjoying the small groups, a more laid back approach, quicker pace, more effective than traditional lecture, and closer and more open interaction with peers/instructors, as well as immediate instructor feedback. The one theme emerging for improvement was to have more time in each learning pod.

Themes identified with the semi-structured questions were as follows: Question 1; describe how the flipped classroom facilitated a culture of teamwork and collaboration among your peer group. Common themes were: the flipped classroom encouraged dialogue and debate with peers, enhanced problem solving/team-based decision making, the small group's facilitated better interaction with peers, and allowed for communication and consideration of different viewpoints. In Question 2; students were asked to discuss how the facilitator's role impacted the learning environment in the flipped classroom. Themes emerging from this question included the following: Instructors were encouraging, energetic, positive, open, interactive, motivating, knowledgeable, and organized; shared professional experiences; guided learning; provided good feedback, created a comfortable atmosphere, and inspired critical thinking.

With Questions 3 and 4, students were asked, convey how the flipped classroom approach facilitated your problem solving abilities and describe how the flipped classroom approach fostered decision making. These two questions seemed to overlap in regard to student responses. Themes identified by students were that the flipped classroom fostered decision making, allowed problem solving using real-life scenarios, forced critical thinking, put them in leadership positions where they practiced decision making, fostered thinking outside the box to make decisions, and taught them to think through problems more efficiently.

Questions 5 and 6 focused on the effort and preparation prior to class (pre-work) and asked the student to explain the level of preparation/effort required in the flipped classroom compared to a traditional class and which of the key elements of the pre-work did you find beneficial in preparing you for the activities in the learning pods? Themes emerging here were that the flipped classroom required more work and was time consuming. Students did report the preparation was relevant to the in-class activities and that there was adequate time to complete the pre-work. Pre-work the students found most valuable included: researching the practicum "Issue" and the problem solver worksheet. This was followed by the ATI Cases and then the IHI modules.

Questions 7 and 8 focused on favorite versus least favorite aspects of the flipped classroom and asked the student, what was your favorite experience in the Flipped Classroom and what was your least favorite experience in the Flipped Classroom? Themes identified as favorites included: the relaxed interactive atmosphere, collaboration with peers, discussions, and the instructor facilitated learning pods. Themes identified as least favorite included: pre-work, staff nurse learning pod (students said it was redundant - they already knew it), leading the discussions, and no breaks given.

In Questions 9 and 10 the focus was on student confidence prior to the flipped classroom and following the flipped classroom. Students were asked, how confident did you feel about the course material after completing the pre-work before coming to the Flipped Classroom? Varying themes arose from "A little confident" to "Moderately confident". Then students were asked, how confident did you feel about the course material after completing the Flipped Classroom? Themes were overwhelmingly "More/very confident". The final Question 11 asked students, based on your preferred learning style, which teaching strategies used in the Flipped Classroom enhanced your learning of course material? Themes emerging from this question included: "Hands on" activities, discussions, small groups, interactive scenarios, instructor debriefings following activities and peer discussion in each learning pod, completing the pre-work at my pace, collaboration, and more individualized instruction.

Conclusions

The Flipped Classroom is one approach nurse educators can use to facilitate desirable attributes for nursing students who will be transitioning to clinical practice. These attributes include: learning to work collaboratively with the inter professional healthcare team, to problem solve effectively; thereby, improving health outcomes for patients, closing the gap between inter professional education (didactic) and professional practice. From this research study, it can be concluded that the flipped classroom improved student's perceived self-efficacy, promoted the development of critical thinking and decision making, and cultivated an atmosphere of teamwork and collaboration. The research findings support the idea that the flipped classroom approach is an active teaching and learning strategy that fosters self-efficacy, learning, and higher academic success.

Recommendations for Future Research Include:

- Presenting all concepts in the course using the flipped approach measuring perceived self-efficacy.
- Conducting an experimental and control group research study on the flipped approach and the influence on student achievement and perceived self-efficacy.
- Investigating different research variables and their influence on the Flipped Classroom.
- Conducting a larger scale study across the nursing program using the flipped classroom in all nursing courses.
- Comparing this research with similar research conducted at a school of nursing in a metropolitan area.

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