ORIGINAL RESEARCH

"Interacting with the material differently": A mixed methods study exploring nursing student engagement and satisfaction with a flipped classroom approach

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ABSTRACT

Engagement is critical for students to meet learning outcomes, yet modern classrooms face challenges with engagement when using a traditional didactic approach. Alternative options include using a flipped classroom where students review content prior to class, and teachers use in-class activities to increase application, analysis, and synthesis of information. This study aimed to (1) explore for changes in student engagement, and satisfaction, and achievement among students in a flipped classroom learning environment between mid and end of semester; and (2) to further explain quantitative results through qualitative student feedback. A convergent mixed methods design was used to recruit sixty-four nursing students in a Midwest U.S. College of Nursing, who completed a survey at mid and end of semester in the Fall of 2015. Students were also given the opportunity to participate in a focus group (n = 36) after the final survey. Most students were satisfied with the flipped classroom approach including before class materials, knowledge check quizzes using real-time response software, and the group test activity. However, participants were unsatisfied with reflective journal writing and group-based in class learning activities. Qualitative focus group data provided an explanation of quantitative results by identifying aspects of the flipped classroom viewed as helpful or not. Themes included small groups, enthusiastic teacher, repetition and application, doubling up on work, engaging, and dislike for course topic. More research is needed on pedogeological approaches to engage modern students, so they are prepared for nursing practice after graduation. The flipped classroom approach, which leverages multiple learning strategies, may be valuable to engage students and promote application of content.

Key Words: Flipped classroom, Student engagement, Nursing education, Learning strategies

1. INTRODUCTION

The modern classroom faces challenges towards engaging its modern students, as Generation Z enters the college space with unique learning needs and wants that teachers must meet.[1] Higher education classrooms have typically used the traditional didactic approach for learning, which involves content delivery from the teacher.[2] The passive learning strategies found in this didactic approach has led to students' lack of attention and subsequent comprehension.[3–5] There is a need for improved and sustained student engagement, as a critical element of learning and processing information,[2,6] especially in nursing curriculum where students are being prepared to enter a fast-paced clinical workforce.

1.1 Tailoring learning environments to meet students' needs

Studies have suggested that the best classrooms to meet the needs of their higher education students involve teachers

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putting students in a position of responsibility for learning, motivating them to find their own answers.[7] Involving active and cooperative learning strategies are also ways to increase student engagement.[8] The recent shift of the classroom towards more flexible, active, and student-centered approaches[9] has urged educators to tailor the learning environments to the various needs of students by using different strategies. Specifically, aspects of a learning environment can be tailored to involve: (a) student-faculty contact, (b) reciprocity and cooperation, (c) active learning, (d) feedback, (e) time on task, (f) high expectations, and (g) diverse talents and ways of knowing.[10]

Moreover, different strategies can be incorporated through a flipped classroom approach. This particular approach involves swapping traditional classroom activities (i.e., lectures) to home activities, and homework activities to the classroom.[11, 12] The flipped classroom approach helps students to progress through the next phases of Bloom's taxonomy including application, analysis, and synthesis of information.[13] In flipped classrooms, the students are more responsible for their learning and the teacher can focus their efforts on developing meaningful activities.[14] The flipped classroom has been shown to increase student engagement,[15] satisfaction,[16] and achievement.[17, 18] The positive attitudes of students towards flipped classroom have further been found to increase engagement, motivation, and effective learning.[19]

1.2 The gap in understanding nursing students' needs

Despite the increase in use and value of a flipped classroom approach, a paucity of evidence exists to determine whether the flipped classroom improves student outcomes in nursing courses specifically.[20, 21] The gap in the teaching and learning literature of nursing provides an opportunity for evaluation of a current flipped classroom course at a Midwest university College of Nursing to provide insight on valuable strategies of the flipped classroom to inform future curriculum redevelopment efforts. The following research questions guided this study: do flipped classrooms increase engagement among nursing students, and what parts of this course do they like or dislike?

1.3 Purpose

The purpose of this study was: (1) to explore for changes in student engagement, and satisfaction, and achievement among students in a flipped classroom learning environment between mid and end of semester; and (2) to further explain quantitative results through qualitative student feedback. Through gathering quantitative and qualitative data, our goal was to form meta-inferences about how a flipped classroom learning environment may impact student engagement, achievement, and satisfaction.

2. METHODS

2.1 Research design

A convergent mixed methods design was used to accomplish the study purposes.[22] Study approval was obtained from the University of Cincinnati Institutional Review Board prior to initiation of recruitment. Undergraduate students at a Midwest College of Nursing enrolled in any of the three sections of a junior-level research and evidence-based practice course were recruited during Fall semester 2015 to participate.

Mixed methods

The mixed methods research process used in this study follows the basic understanding that mixed methods research involves collecting and analyzing both qualitative and quantitative data, and then findings are integrated to make inferences from both approaches.[23] The researchers followed concurrent timing and placed priority on the quantitative data as the primary source of interest.[24] The qualitative data serves as a supplementary data assisting with explaining quantitative findings. A visual depiction of the study design is shown in Figure 1.
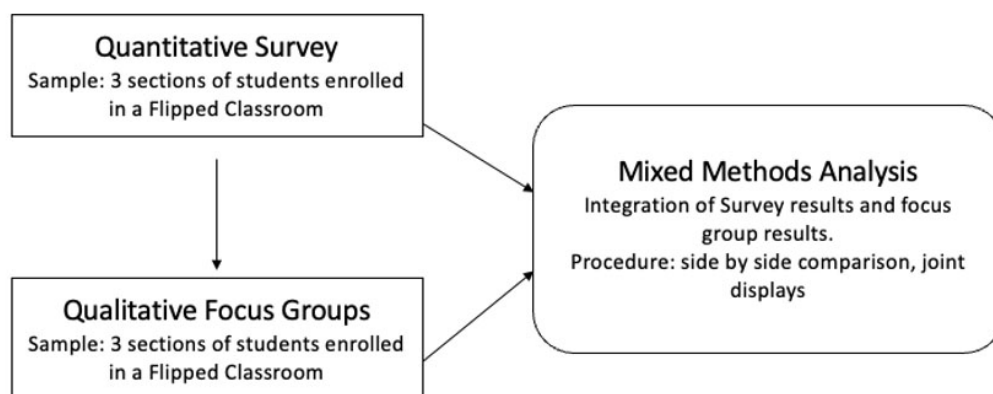

Figure 1. Convergent mixed methods study design

The rationale or reasons for using mixed methods research to answer the research questions were for both triangulation and complementarity. Specifically, triangulation is the argument for completing mixed methods research to validate or corroborate conclusions by comparing results from the quantitative and qualitative methods that have explored the same phenomenon.[24, 25] Complementarity is a reason for using mixed methods to elaborate, enhance, or clarify conclusions of one method with results from the other.[25]

The mixed methods approach guided the choices in study development, integrating qualitative and quantitative methods in design, sampling, and analysis. The concurrent timing allowed the researchers to collect and analyze both quantitative and qualitative data around a similar time and be analyzed and compared together. Results were then integrated through merging[26] to create inferences, or additional insight into results that would not have been possible without the mixed methods approach.[24]

2.2 Quantitative methods
During week 1 of the course, students were informed that internal course evaluation data would be collected from all students, but students who provided informed consent would be included in additional research study activities. Students were instructed that participation was voluntary and that they could withdraw from the research study at any point in time. Written informed consent was obtained from students prior to starting data collection activities. Students were asked to reaffirm consent at mid-semester and end of semester data collection points. To prevent coercion, the PI, who was also serving as the course instructor, was not present in the classroom when the Co-I reviewed the research study purpose and obtained written informed consents.

2.2.1 *Participant characteristics & sampling procedures*
A total of 64 students consented to participate in the study. Demographic data were collected at the start of the semester and included student's living situation (either on campus or off campus), prior flipped classroom experiences, and perceptions of the importance of completing pre-class assignments and readings.

2.2.2 *Measures*
The mid- and end of semester surveys contained two tools used to measure student outcomes of engagement and satisfaction. Student Engagement[8] was used to measure overall student engagement. This 14-item self-report scale included three subscales (cooperative learning, cognitive level, and personal skills) and evidence of acceptable reliability (α = 0.84) with college students.

The 7-item self-report Student Satisfaction with Flipped Classroom survey was developed by the PI for this study and used to measure overall level of student satisfaction with the flipped classroom approach as well as levels of student satisfaction with specific learning strategies employed (e.g., before class materials, knowledge check quizzes using real-time response software, group work, reflective journals). Higher scores on this survey indicated higher levels of satisfaction.

Finally, student's course grades were recorded at mid- and end of semester as a measure of achievement or student success in the course.

2.2.3 *Analysis*
The data were cleaned, imported into JMP pro 16 statistical software, and coded according to survey instructions. Demographic data were explored for trends and characteristics of the sample. Student engagement, student satisfaction, and average course grades were analyzed to find means, averages, and ranges for the differences in class sections from mid-semester to the end of the semester. Two samples *t*-tests (or nonparametric Welch's tests where appropriate) were used to compare mid- and end of semester student engagement and satisfaction scores. We used an alpha level of 0.05 for all statistical tests.

2.3 Qualitative methods
The quantitative survey phase was followed by the completion of in-class focus groups with 36 students from the three sections of the same course.

2.3.1 *Participant characteristics & sampling procedures*
Sampling in the qualitative strand involved the same students that were in the initial quantitative phase.

2.3.2 *Measures*
Focus group participants were asked: (1) tell me about your experience in this course; (2) tell me what parts/activities of the flipped classrooms helped you most with learning the course content; (3) tell me parts/activities of the flipped classrooms that helped you the least with learning the course content; (4) tell me about your overall satisfaction with the course.

2.3.3 *Analysis*
The focus groups were transcribed and read for analysis using manifest content analysis.[27] The researchers reviewed the transcripts for initial codes and themes and compared coding for coherence until agreement occurred. Qualitative focus group data were further examined for evidence that supported or explained the quantitative findings and were

then integrated in the discussion through the creation of a joint display.[28]

3. RESULTS

3.1 Baseline data

Of the 64 participants, most were female (n = 53, 82.8%) and lived in off campus housing (n = 47, 74.6%). Over half (n = 40, 62.5%) had either no prior experience with or knowledge of a flipped classroom design prior to this course and 56.3% (n=32) reported preparing for class only 'a little bit' to 'some of the time'–representing a mid-level of preparation. While controlling for gender, living situation, and pre-class participation, end of semester grades significantly differed between students in section 1 and those in section 3 [p-value < .001, 95% CI: (0.01, 0.05)]. On average, those in section 1 (M = 0.9, SD = 0.005) had significantly higher grades than those in section 3 (M = 0.87, SD = 0.005), F = (2, 165) = 10.34, p < .001. A significant difference was not detected between sections 1 and 2. Participant demographic data are provided in Table 1.

Table 1. Study participant demographic data at start of course

Characteristic	n	%
Gender		
Male	11	17.2
Female	53	82.8
Section Number		
Section 1	31	48.4
Section 2	14	21.9
Section 3	19	29.7
Campus Program		
Main campus	45	70.3
Satellite campus	19	29.7
Living Situation		
On campus	16	25.4
Off campus	47	74.6
Prior Flipped Classroom Experience		
Has taken several flipped classroom courses	11	17.2
Has taken one flipped classroom course	13	20.3
No previous flipped classroom courses	30	46.9
No knowledge of a flipped classroom	10	15.6
Importance of Pre-class Assignments and Readings for Success		
Very important	26	40.6
Somewhat important	35	54.7
Not important	3	4.7
Class Preparation		
High Level Pre-class Preparation	20	31.2
Mid-Level Pre-class Preparation	36	56.3
Low Level Pre-class Preparation	8	12.5

3.2 Student engagement and satisfaction

The average overall score of student engagement at mid semester was 33.4 (out of a possible 56) and 37.7 at end of semester - indicating moderate levels of student engagement both times. Levels of engagement increased from mid semester to end of semester on all three subscales. Changes in subscale scores were examined using a two samples t-test, which suggested a statistically significant increase in engagement scores from mid to end of semester for all three subscales. Self-reported student scores for overall satisfaction with flipped classroom ranged from 7 to 49 (max score = 49) with higher scores indicating higher levels of satisfaction. A statistically significant increase in overall student satisfaction scores was observed between mid-semester (M = 30.2, SD = 1.06) and end of semester (M = 35.7, SD = 1.26), F (1, 119) = 11.27; p = .001. Complete results are presented in Table 2.

When examining student satisfaction with specific learning strategies used in the flipped classroom, responses were dichotomized to identify which strategies had the highest levels of endorsement at the end of the course. Responses of somewhat satisfied, satisfied, or very satisfied were grouped to indicate student satisfaction with a specific strategy. At mid semester, the knowledge check quizzes using real-time response software strategy had the highest percentage of student satisfaction (43.8%) followed by before class materials (i.e., online lecture, iBook, additional resources; 39.7%). Strategies receiving the lowest levels of student satisfaction were reflective journal writing (18.2%), class debriefing sessions (25.6%), and group-based activities (31.4%).

At the end of the semester, knowledge check quizzes using real-time response software continued to be a strategy with the highest percentage of student satisfaction levels (34.7%) and tied with group tests (34.7%). The strategy of providing before class materials (i.e., online lecture, iBook, additional resources) continued to have support (31.4%). Like at mid-semester, the reflective journal writing (22.3%), class debriefing sessions (26.5%), and group-based activities (29.7%) remained the strategies for which the most students reporting lowest levels of satisfaction.

3.3 Course grades

Course grades were used as a proxy for the student achievement outcome. The average mid semester grade across all sections was 86%. Sections varied slightly at mid semester, with section 2 having the highest course grade average (87%), followed by section 1 (86%), and then section 3 (83%). The average course grade at end of semester was 88.9%. Again, variation among the sections occurred with section 1 attain-

ing the highest average course grade (90%), followed by section 2 (89.7%), and then section 3 (86.8%). Differences were examined using ANOVA and suggested that end of semester course grades differed significantly by section $F(2, 165) = 10.39$, $p < .001$. After running a Tukey's HSD, we found section 1 and section 3 final course grades significantly differed (p-value = .0001) and section 2 and section 3 significantly differed (p-value = .0009).

3.4 Qualitative themes

Five themes emerged from the qualitative focus group data surrounding the student experience and satisfaction, along with helpful and unhelpful elements of the course as: small groups; enthusiastic teacher; repetition and application; doubling up on work; and dislike for course topic. Definitions for and participant quotes that exemplify each theme can be found in Table 3.

3.5 Integration

Focus group data were used to generate a better understanding of the quantitative results. Engagement results were considered by looking at each subscale and what was measured. The cooperative subscale looked at working with others (e.g., teaching others class materials). The cognitive subscale looked at applying theories or concepts to problems or experiences and analyzing concepts. The personal subscale looked at learning individually and critically or analytically thinking. The qualitative phase provided confirmation of quantitative results,[26] where participants noted the benefits of learning with, and teaching one another. More details can be found in the joint display of student engagement data presented as Table 4.

Table 2. Change in student engagement and overall satisfaction from mid- to end of semester

	Mid Semester		End Semester		Change	
Scale	*M*	SD	*M*	SD	*t*	*p*
Student Engagement	33.4	0.8	37.7	0.9	4.33	.0006
Cooperative Learning	9.16	0.21	10.25	0.25	1.1	.00009
Cognitive Level	13.54	0.38	15.25	0.44	1.71	.004
Personal Skills	10.71	0.4	12.24	0.47	1.52	.016
Student Satisfaction	30.2	1.06	35.7	1.26	5.52	.001

Student satisfaction was explored more in-depth with the qualitative data from the focus groups as well. Students similarly varied in their satisfaction levels in the qualitative phase but shared further reasoning as to why they disliked or liked some of the activities. For example, the group tests learning strategy scored highly for satisfaction and received support during the focus groups. On the other hand, despite scoring highly on the student satisfaction survey, some students did not like the knowledge check quizzes using real-time response software, revealing discordance between the data strands.[26] The focus group information elaborated that the dissatisfaction was mainly due to the length of time the instructor spent on some questions rather than the knowledge check quiz strategy itself. Mixed results suggested that students would be more satisfied with the knowledge check quizzes if less time was spent on easier questions that most students got correct.

In some instances, focus group data supported the lack of satisfaction with group-based in-class learning found in the survey. However, the qualitative results provided expansion of these results,[26] as some reported higher levels of satisfaction with group-based in-class learning activities than satisfaction

survey data revealed. Specifically, focus group participants explained that the feelings of dissatisfaction stemmed from when others in the group did not do the pre-class work and therefore could not participate effectively in the group activities. Yet, others valued the opportunity for communication to facilitate learning in this group structure. These results highlight the importance of participation and willingness to complete the readings and assignments prior to class in a flipped classroom.

Interestingly, some students enjoyed the pre-class work (pre-recorded online lectures, resources) while others did not. Participants explained that completing pre-class work took time and could be improved if the length of lecture videos were reduced to make it less time-consuming. Finally, low satisfaction levels with the reflective journal entries were supported by the focus group data. Students suggested that the self-reflection journal activity would be improved if they were periodic (e.g., every 3 weeks) rather than weekly. More information can be found in Table 5, illustrating a joint display of quantitative and qualitative student satisfaction with flipped classroom data.

Table 3. Qualitative themes on how flipped classroom approach promoted student engagement

Themes	Definition	Supporting Data from Focus Group
Small Groups	*Students identified that in-class small group activities contributed to student engagement and learning most of the time.*	"I think it was cool that we would have these different groups that would split up and we would, um, for example, have an article to look at, and we would, um, look at the conclusions, the results, um, that fit a certain research question, and we went through that process to determine the quality, etc. So… having those conversations in the group with that research article, and then everyone kind of standing up and sharing what they thought about it…"
		"…the small groups though, I feel like most of the learning that I did was while we [were] talking about it."
		"…the group [work] – when we had split up into like the smaller groups, we actually applied what we were learning, and … worked stuff out and that helped a lot, too."
		"...putting those groups together you more or less – you were able to divide some people's strengths and weaknesses…"
		"I kind of liked being in… small groups and stuff. It was nice to be able to talk to your peers … and do that different activities."
		"… discussing the material in a group. It's like, if you study with a partner, you're getting more out of it."
		"…I didn't think the group work was very beneficial because some people didn't do the pre-class work and if they didn't do the pre-class work then you're sitting with group members who don't know what they're doing and it was kind of frustrating."
Enthusiastic Teacher	*Students discussed the creativity, passion for the course, and knowledge of the professor, which increased student engagement*	"…she was the best teacher to teach this class. She was very good at what she did. She was very knowledgeable on it and she was very good at if you even did wrong one time she would get back to you right away. That was not an issue."
		"…[the teacher] did a really good job incorporating group work activities into the class, which was like a different perspective than just lecturing all day."
		"I would greatly praise the professor's knowledge."
		"I think she was just definitely enthusiastic about doing… the flipped classroom stuff. Having a teacher that actually cared about doing it."
		"…she did a really good job trying to get us engaged and, you know, giving us activities that made us, you know, talk and try to figure them out."
Repetition and Application	*Students described how the learning strategies in the FC approach promoted student engagement through pre-class activities, use of repetition, and in-class activities designed to apply content and engage in critical thinking.*	"I did like the way that she taught because it seemed like every single class – what we went over, we then had an assignment to apply it with. Like, the big group project at the end – that was taking everything we learned and actually applying it to something that we can learn more from and just establish like a knowledge-based versus just learning information and then trying to retain that without having a lot to apply it to."
		"I would agree with that too about the reinforcing because having the lectures recorded prior to class, having all that extra pre-class information available then coming to class and then having that all reinforced, it was very beneficial."
		"I think there was a lot of value in enforcing that the classroom time is the time where you actually are kind of integrating what you learn and applying what you learn as opposed to maybe you are - you do read before you come to class and you just kind of repeating information, which still works. I mean, repetition has shown that it can help with memory and that kind of stuff, but, um, I do think it's important, especially in a field like nursing, that you can actually take it to the next level and not just say, 'Okay, I have this knowledge' but actually be able to use that. Critical thinking is huge."
		"I really liked the flipped classroom methodology. That kind of teaching- I think that's a great way for us to learn. But the students have to be prepared before they come to class and the majority of students just honestly don't do the readings before class."
		" …it did kind of make me feel more focused on like – at least I kind of had like a background on like what was going on, like going into class each time because we had to, um, review all of like the quizzes and, um, the PowerPoint's prior to coming into class, so it was different, I think."
		"I think it kind of made you, um, like put it as motivation to like look into, like the lecture in the coming week because if you didn't you didn't really know what was going on in class when she talked about it."
		"…we did like the hands-on kind of quiz, like in class, and then you had like the auditory lectures, and then you had the iBooks, so I think it definitely applied to any kind of learner."
Doubling up on Work	*Students perceived the assigned pre-class work (e.g., readings, viewing pre-recorded lectures) as busy work and duplicative of in-class content and therefore decreased engagement.*	"It was definitely a lot of busy work, but I think it was like kind of worth it for like what we were learning. There was a lot of content, a lot of like stuff I was not familiar with whatsoever. So, kind of getting background and then coming in and like applying it to like our projects was helpful."
		"I don't have time at home to listen a two-hour lecture, do other homework and then come in and hear the same thing."
		"The pre-class quizzes at home maybe were kinda just doubling up on quizzes. Doubling up on work… because a lot of them were the same questions as we were doing in class."
		"It was all over the place. I would have learned the material and then I had a question on this but we might be discussing this in class and I would raise my hand and be like, wait, well what is this because we haven't discussed because we were already have supposed to. It's the mindset of already having the knowledge that I do not like."
		"I think the length of …[the audio recordings] could have been cut down, because they would get pretty lengthy, and there might be several of them to watch in one week."
Dislike for Course Topic	*Students described that the course topic of research and evidence-based practice detracted from student engagement.*	"The class motivation in general…I would say just by knowing what the class was, there was a lot of negativity… just around the topic [of research and evidence-based practice]."
		"I'm not going to go into research or anything like that, so it was not completely interesting to me, I guess you could say."
		"I think one thing that might've helped just in this class in particular…is that so many people didn't like the class because they don't see how it connects to them in their nursing practice. Like, 'why am I spending so much time on this class? I'm not going into research.' And she tried to make the connections… but I think most people still were just like, 'this is a waste of time.'"
		"…we think it's a waste of time having an entire class focused on this material for everybody. Because – I mean, in the whole classroom, I think I've seen maybe – they'll be like, 'Who's interested in going into research?' Maybe five hands out our cohort of a 126."

4. DISCUSSION

Results have indicated that most students were satisfied with the course, specifically with the group tests, knowledge check quizzes with Socrative, and before class materials. However, participants were very unsatisfied with reflective journal writing, and group-based in-class learning activities. The qualitative data provided a deeper explanation of these quantitative survey results, where students discussed satisfaction with group-based activities. Five themes emerged from the qualitative focus group data surrounding the student experience and satisfaction, along with helpful and unhelpful aspects of the course as: small groups, enthusiastic teacher, repetition and application, doubling up on work, and dislike for topic. The qualitative results of this study provided discordance and expansion of quantitative results,[26] revealing the complexities of individual student learning needs. More specifically, Socrative was found both helpful and not helpful when taking too much time for certain questions; some students liked audio recordings, some did not; and some liked group work and others did not.

Table 4. Joint display of changes in student engagement and student feedback

Areas of Student Engagement	Change in Subscale Score	Student Feedback
[†]**Cooperative Learning** • Asked questions during class • Worked with other students • Worked with classmates outside of class • Tutored or taught class material to other students in class	9.16 to 10.25[†]	• "...discussing material in a group. It's like, if you study with a partner, you're getting more out of it. And so, I felt like – it's like when I had somebody in my group that hadn't done the reading, like the act of me explaining the material to them was [helpful]" • "...it's better when you teach the content yourself, sometimes – than when you're just getting taught it. If you can teach it to someone else then you've mastered the content."
[†]**Cognitive Level** • Memorizing facts and ideas so you can repeat them in almost same form • Analyzing basic elements of an idea • Synthesizing and organizing ideas into new, more complicated interpretations and relationships • Evaluating the value of ideas, information, or experiences • Applying theories and/or concepts to practical problems in in new situations	13.54 to 15.5[‡]	• "It gave you a better, like chance to actually apply the information you learned rather than just looking at it and reading it, knowing it, and in class actually we're applying it and using questions and that helped." • "...definitely all the activities, and even taking it from just going through the entire research process and being able to, one piece at a time, be able to be involved in that process. Um, I think that's valuable."
[†]**Personal Skills** • Acquiring job or career related knowledge of skills • Writing clearly, accurately, and effectively • Thinking critically and/or analytically • Learning effectively on your own • Work effectively with other individuals	10.71 to 12.24[‡]	• "Critical thinking is huge. And so, if that step doesn't even take place in the classroom, the gap that you're going to have to fill once you graduate to be able to work as a nurse is even larger to fill." • "So kind of getting background and then coming in and like applying it to like our projects was helpful."

Note. [†]statistically significant increase from mid to end of semester; [†]Potential subscale score range is 4 to 16; [‡]Potential subscale score range is 4 to 20.

Other literature encourages the use of a variety of teaching strategies in nursing education to support effective student learning and appeal to different learning styles.[29, 30] Strategies include the use of games,[29] which was employed in this study with the use of the Socrative interactive learning platform. Further, the use of games has been shown to help nursing students develop deeper learning with lower stress levels, increase critical thinking and motivation, and enhance student experience.[31] Other evidence-based teaching strategies for nurse researchers may include case studies and concept mapping. However, implementing such strategies may pose challenges for nurse educators who need time and resources for consideration and implementation.[30]

Other challenges for nurse educators include rethinking ways to deliver course content and engage students in the post COVID-19 pandemic classroom space with the increase in use of hybrid approaches and updated technologies. More efforts are needed to maintain student engagement in both

in-person and hybrid approaches. Continued exploration of technology should be completed, and methods of collaboration and resource-sharing should be strengthened to reduce the strain on individual nurse educators.

Further, nurse educators are tasked with engaging nursing students in a way that instills values of life-long learning and commitment to the nursing profession. Further educational approaches that excite nursing students on their quest of continued learning in their professional practice are needed to meet the demands of the current changing healthcare environment and encourage a sustainable nursing workforce.

Table 5. Joint display of learning strategies by rank of student satisfaction and student feedback on strategy

Learning Strategy	Satisfaction Rank	Student Feedback
Knowledge check quizzes using real-time response software	1	• "... those quizzes were really good reinforcement to use, and then we talk about them so much... the Socrative app was really helpful." • "…there would be a question and then we would wait for everyone to answer, and then we would talk about it, and then we would do another one and wait for everyone to answer and then talk about it. And that could take a really long time, because some people took a while to answer... sometimes we spent maybe a little bit too much time on questions that didn't need as much discussion around them."
Audio recordings (Pre-class material)	2	• "…the reading that had to take place before was not extensive. It wasn't too much I don't think...And the audio, the audio recordings also helped, kind of begin to add some more integrative points." • "…it was actually a detriment to my learning style. With lectures prerecorded, it's harder to focus at home. Watching lectures and getting information out of it that I needed to then coming to class and just getting an assignment where I found that the more traditional classroom where professors lecture then present the information" • "I would have liked to have heard [course content] from her personally, not just online and...it's harder to concentrate when you're sitting at home and you're trying to teach yourself the material and it's harder if you have questions. I found myself constantly writing down questions. Like, okay, ask this in class – ask this in class – ask this in class. Whereas if I was right there at that moment, I could have just raised my hand and asked it."
Group Tests	3	• "I really like the way we did the – uh, we had one test where we took it by ourselves, and then we did it like with a group of people, and I think that helped a lot just because like almost all of us got a 100 percent when we did it together, just because we were able to finally talk through why we reasoned the way we did, which was really cool."
Group-based in class learning	4	• "...the students have to be prepared before they come to class and majority of students just honestly don't do the reading before class. They wanna come to class and have instructors kind of spoon-feed it to them through the lecture, so when they're split off into groups to do the work, half of the group is like, 'I have no idea what we're doing.' Because they didn't prepare ahead of time and so the groups aren't getting through the material in an effective way." • "I liked the small groups but again, it's based on how many people actually wanna participate, what they actually are willing to actually put forth or if they like it or not. So, I found that a lot of our small groups that we were doing weren't necessarily good because of the participation aspect of it." • "I think those [working in small group] conversations helped."
Self-reflections	5	• "I remember the end of the class, like it wasn't that it was like at least helpful, I just didn't really see like a benefit to me. It was probably more of a benefit to the professor, but like we had to talk about, like what – like just kind of like a summary of the class, like what we learned, what we needed improvement." • "I think [a reflection] would apply what you learned the past three weeks because, like week to week stuff, it's hard to be able to apply that to what is it doing for you... or like maybe even like add it in like the bottom in like a reflection, like what did you learn, like during, like when you were reviewing this information."

Limitations

There are certain limitations of this research to note. Due to the method of data collection, student demographic information collected at the beginning of the semester could not be linked back to individual responses at mid- and end of semester. Therefore, additional analyses examining changes in student outcomes by demographics could not be conducted. Second, the timing and location of the sections varied. Stu-

dents enrolled in sections 1 and 2 attended the course on the main campus and those in section 3 were at the satellite campus and tended to be non-traditional students (e.g., older than the 18 to 23-year-old traditional undergraduate student, part-time student). As section 3 had the lowest grades at mid and end of semester, further investigation is needed to explore the extent to which campus location and type of student (traditional vs non-tradition) influence nursing student learning outcomes.

5. CONCLUSION

Overall, satisfaction among nursing students in a flipped classroom course increased by the end of the semester. Stu-

dents recognized how small groups, the enthusiastic teacher, and learning strategies that focused on repetition and application in a flipped classroom course contribute to their engagement and satisfaction. However, students acknowledged that the course topic was a barrier for some student engagement and that at times, the flipped classroom involved doubling up on work. Use of a mixed methods approach provided valuable insight into the individual experiences of students and the continued value for evaluating and considering various approaches to engage nursing students and increase student learning.

CONFLICTS OF INTEREST DISCLOSURE

The authors declare that there is no conflict of interest.

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