

## ORIGINAL RESEARCH

# Blended learning in a health assessment course: A mixed-methods study

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## ABSTRACT

**Objective:** The purpose of this study was to get students' perceptions about changes made to the health assessment course delivery format from face to face to blended learning (BL). Health assessment is a foundational course in nursing undergraduate programs. Research has suggested that students have high levels of satisfaction with a blended learning format.

**Methods:** A survey was used to gather students' perceptions about changing a health assessment course from face-to-face delivery format to a blended learning format. All second year BSN students who were registered for the course (N = 88) were invited to participate in the survey at the end of the semester.

**Results:** Most students in this study preferred face to face course delivery. Qualitative results were grouped together into themes: 1) Engagement, 2) E-learning tool, and 3) Confidence. Opinions were mixed concerning the e-learning materials that were used. Overall, students felt they were confident in their assessment skills as they prepared to enter the clinical environment.

**Conclusions:** Findings from this study will impact methods of teaching health assessment and other nursing courses in the future.

**Key Words:** Education, Nursing, Baccalaureate, Computer-assisted instruction, Curriculum, Covid-19 Pandemic

## 1. INTRODUCTION

Health assessment skills are the foundation of a nurse's practice. Therefore, it is crucial that nursing faculty ensure that the redesigning of health assessment courses, to a blended learning format, does not lead to gaps in psychomotor and physical examination skills. The Covid-19 pandemic forced higher education to close its doors to in-person teaching and learning. While predominantly lecture-styled courses shifted synchronously and asynchronously online, courses with in-person hands-on lab and clinical experiences faced a more challenging transition. These hands-on experiences were traditionally done in a lab or clinical setting. Creative solutions were sought to ensure that students got the experiences that they needed while still maintaining safe environments. Problems surrounding mandated infection control restrictions and

requirements for social distancing, delay in or lack of access to traditional textbooks, potential lack of internet in some of our more rural students' homes, and the availability of personal protective equipment (PPE) affected our decision to teach this course in a blending learning (BL) format.

Prior to the pandemic, the pre-licensure BSN nursing program, of about 350 students at a four-year public university, delivered didactic, lab, and clinical components of courses in the traditional face-to-face format. To adjust to the restrictions caused by the pandemic, the course was delivered in a BL format, incorporating synchronous and asynchronous online teaching and learning activities. To offer this course in a relevant, sustainable format, planning ensued to determine whether to maintain the current blended learning or return to

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the more traditional in person format. The authors set out to investigate 2nd year BSN students' perceptions of changing the health assessment course delivery from its traditional face to face format to a blended learning format over the course of a 15 week semester. Research aims in this study were: 1) to evaluate the students' confidence in performing health assessment skills at the end of course delivery in the BL format, 2) to determine if we should continue to use ATI HealthAssess (™), and 3) to determine if we should continue to offer this course in a BL format.

## 2. BACKGROUND

Traditionally, the health assessment course consisted of 2 hours and 50 minutes of in-person didactic instruction and 2 hours of in-person lab instruction a week for 15 weeks. A traditional physical examination textbook was utilized. Students met course objectives through exams, assigned textbook readings, and demonstration of psychomotor physical examination skills. The global pandemic threatened the stability of in-person teaching and learning, magnified systemic inequalities in higher education, and limited social interaction among faculty and students which is a hallmark for nursing education. With stay at home and physical distancing orders, in-person courses moved to an online format in a matter of days. There was little time for faculty development training focused on course redesign for the new format. Social engagement was impeded when students returned to their home environments, away from peers and social networks. This lack of social engagement affects students' confidence and academic engagement.<sup>[1]</sup> Unfortunately, the abrupt nature of changing routine teaching and learning formats as well as the change in their support system resulted in students expressing feelings of loneliness and social disengagement.

### 2.1 Teaching and learning strategies

Tackling so many urgent and unexpected challenges felt like flying the plane while building it. For this reason, careful thought, coordination, and strategic planning were necessary to deliver quality learning experiences for the health assessment course. Key logistical challenges included space restrictions to decrease exposure risk from close contact; limited or delayed access to traditional textbooks; inconsistent access to technological resources; and shortages in PPE, which were required to deliver the didactic and lab portions of the course.

We instituted BL as an approach that engaged students and used a mix of delivery options: in-person, synchronous and asynchronous online teaching and learning activities. Our goal was to institute teaching and learning strategies that delivered sustainable and high-quality instruction. BL provided

more flexible learning opportunities, allowed for repeated review of course materials as needed, and presented convenience for students to work at their own pace.<sup>[2]</sup> Incorporated electronic resources and e-tools add to the many educational resources online and helped to meet learning outcomes and program objectives.<sup>[3]</sup> Berga et al.<sup>[2]</sup> examined outcomes of self-efficacy, knowledge, and perceptions in an undergraduate nursing health assessment course using BL and in-person learning delivery formats. The researchers found a positive correlation between "learner motivation and metacognitive qualities and frequency of online interactions in BL contexts; high student achievement in the BL environment; and high level of satisfaction with the BL approach" (p. 5).<sup>[2]</sup> A systematic review evaluating the impact of online or BL versus face-to-face learning of clinical skills in undergraduate nursing education programs found that students acquired a higher or similar level of clinical skill when comparing online or BL with traditional face to face format.<sup>[4]</sup> Having unlimited access to online instructional resources and the ability to review the content at their own pace can lead to enhanced learning and skill performance.<sup>[5]</sup> Selected teaching and learning strategies promoted efficiency, positive interactions among faculty and students, and intellectual stimulation while challenging the students.

The revised BL health assessment course included 100% online delivery for the didactic component, a hybrid lab component, and the use of Assessment Technologies Institute (ATI) HealthAssess(™) for e-learning resources. This online learning platform contains assessment modules and virtual practice patients. The lab component of the course was decreased from 2 hours/week in-person to 1 hour/week in-person to allow for smaller lab groups to comply with social distancing guidelines. Demonstration videos were provided to the students to supplement time in the lab. Incorporating e-learning resources into the course provided repeated access to web based instructional resources that are consistent, interactive, and "bite sized". Lashley<sup>[3]</sup> stated that e-learning resources "reduce face to face time in the classroom which results in students independently evaluating their knowledge and skills and return to the lab better prepared to demonstrate technical skills" (p. 349). Providing instructional resources that are relatable to hands-on experiences improve learning.<sup>[6]</sup>

With a class size that exceeded the maximum capacity of our largest classroom, offering the didactic component of the course solely online synchronously gave the faculty and students an opportunity to connect in "real time". Students were able to work in small groups within breakout rooms to participate in meaningful discussions and engage as a community. Ali<sup>[7]</sup> states that "online learning environments foster

learning experiences where learners interact, collaborate, and take ownership of their own learning” (p.19).

While reducing the in-person lab time to an hour limited the amount of time in close contact, it also provided an opportunity for students to perform physical assessment and vital sign measurement skills under the mentorship of faculty. Including demonstration videos for review and practice prior to in-person lab sessions provided remote learning that was accessible, convenient, and effective.<sup>[8]</sup> These video recordings were available throughout the semester to allow flexible on demand access for those who chose to work ahead and/or revisit the assessment skill.

### 3. METHODS

A mixed methods Qualtrics survey was used to gather students’ perceptions about changing a health assessment course to a blended learning format. A non-probability convenience sampling was used for this pilot study. All second year BSN students who were registered for the course (N = 88) were invited to participate in the survey at the end of the semester. This study relied on participants to complete a questionnaire that was developed by the researchers based on anecdotal feedback from students. The questionnaire was non-validated and non-reliable. The questionnaire included 10 closed-ended and 6 open-ended questions, encouraging the participants to describe their response more in depth. Descriptive statistics were used to describe responses to the closed-ended questions. The responses to the open-ended questions were sorted by theme and analyzed using content analysis. Content analysis was selected to interpret the participants’ responses related to changing a health assessment course to a BL format. The data was reviewed by the researchers and themes emerged from the information. Next the researchers organized the data into themes and reviewed them together. Content analysis was consistent for each question. The questions are shown in Table 1 below. Approval to conduct the study was granted by the university’s institutional review board.

The questionnaire explored students’ perceptions about course delivery, format, e-learning tools and their confidence level prior to entering the clinical setting after experiencing the course in a BL format. Three themes emerged from this information: 1) Engagement, 2) E-learning tool, and 3) Confidence. Each theme contains examples from the responses to the questionnaire.

### 4. RESULTS

Of the 88 potential participants, a total of 57 (65%) students completed the survey. Table 1 shows the quantitative data.

**Table 1. Quantitative data**

Items	
What grade do you expect to receive in this course?	A+ 6.5%
	A 55%
	A- 32%
	B+ 6.5%
How helpful did you find ATI HealthAssess™? Why or Why not?	Very Helpful-6.5%
	Helpful-45%
	Somewhat Helpful-38.5%
	Not Helpful-2.5%
	Did not answer-5%
Did you find the ATI HealthAssess™ Virtual Patients helpful to your learning? Why or Why not?	Very Helpful- 10%
	Helpful--21.6%
	Somewhat Helpful--23.3%
	Not Helpful-40%
Would you have preferred a traditional textbook to ATI HealthAssess™? Why or why not?	Did not answer--5%
	Yes-21.6%
	No-45%
	Maybe-28.3%
How many hours a week did you spend in ATI HealthAssess™?	Did not answer-5%
	< 1 hour-1.6%
	1-3 hours-78.3%
	> 3 hours-15%
What do you think could have improved your experience with ATI HealthAssess™? Did you feel you had enough time in the lab to be successful in this course? Why or Why not?	See information in results
	Yes-76.6%
	No-18.3%
	Did not answer-5%
Do you think you would have performed better in the “class” portion of this course if it were in person? Why or why not?	Yes-73.3%
	No-21.6%
	Did not answer-5%
What additional support would have been helpful for you in this course?	See information in results
	*5-36.6%
	*4-48.3%
	*3-10%
How confident are you assessing Vital signs?	*2-0
	*0-5%
	*5- 36.6%
	*4-48.3%
How confident are you assessing the cardiovascular system?	*3-10%
	*2-0
	*0-5%
	*5-45%
How confident are you assessing the respiratory system?	*4-41.6%
	*3-8.3%
	*2-40%
	*0-5%
How confident are you assessing the head, neck and neuro system?	*5-25%
	*4-55%
	*3-13.3%
	*2-1.6%
How confident are you assessing the abdominal system?	*0-5%
	*5-60%
	*4-36.6%
	*3-3.3%
How confident are you assessing the musculoskeletal system?	*2-0
	*0-5%
	*5-31.6%
	*4-21.6%
How confident are you assessing the integumentary system?	*3-21.6%
	*2-1.6%
	*0-5%
	*5-51.6%

\*Key: 5-Very confident; 4-Confident; 3-Somewhat confident; 2-Not confident; 0-Did not answer.

#### 4.1 Engagement

Results showed that 73% of respondents felt they would have performed better in the course if it were in person as opposed to online. Comments were mixed about being online versus in person for the didactic portion of the course. Students did not like to ask questions in the online format and felt “less of a responsibility to do the work”. Student comments centered around better engagement in person as opposed to online:

- I think I would have been more engaged if it had been in person
- I wouldn't have fallen behind as much in person
- It's a lot harder to learn virtually

Additional comments focused on connecting with classmates and the professor online:

- Bonding with you [the professor] is something that we all missed out on. You did your best ...but there is just something cozier about in-person class
- I think that I would have formed more personal connections in person with my classmates and my professor

Respondents struggled to be engaged with the e-learning platform, ATI HealthAssess<sup>(TM)</sup>. Comments centered around the platform not being an engaging way to learn. Students expressed that they were simply doing it for completion as well as being very focused on the technological aspects instead of the content.

#### 4.2 E-learning tool

Since our school already utilized the Assessment Technologies Institute (ATI) platform, we went with the ATI HealthAssess<sup>(TM)</sup> product for the e learning tool. The questions surrounding the ATI HealthAssess<sup>(TM)</sup> program were split into 2 different questions. Fifty-one percent found ATI HealthAssess<sup>(TM)</sup> very helpful or helpful. Most positive comments were centered around how well organized and informative the program was. Negative comments consisted of the content being repetitive to class lectures and sometimes difficult to navigate the technology of the program. In addition to the modules, the program also included virtual patients for students to practice their health assessment skills. Only 35% of students found the ATI virtual practice patients very helpful or helpful. Positive comments were:

- The virtual patients had real problems that we needed to figure out and that is more like what we will be doing in real life
- It was helpful because it served as an opportunity to implement various things we learn in the lecture and lab practices

- It was an opportunity to implement lecture, module, and textbook learnings into clinical practice. Even though it wanted us to do it in a certain way, it still helped with practicing and reminding ourselves with some of the most important things like safety interventions

#### 4.3 Confidence

Seventy-six percent of students felt they spent an adequate amount of in-person time for the lab portion of the course, which was decreased to one hour per week to allow for social distancing requirements. Some comments around lab time included, “ I feel like I had enough time in the lab to learn all of the skills that I had to” and “ I loved the 1 hour lab time... it allowed me to focus and gain confidence”. In the questions associated with ATI HealthAssess<sup>(TM)</sup>, participants connected the modules with their ability to perform clinical skills. Participants mentioned that the demo videos were helpful to review and the virtual patients helped tie together lecture and lab as well as allowed them to practice on “real” patients to prepare for clinical practice. Respondents in this study felt very confident performing clinical skills, even after experiencing this course in a BL format. For example, 85% felt very confident or confident obtaining vital signs and 96% felt very confident or confident doing an abdominal exam (See Table 1).

### 5. DISCUSSION

This mixed methods study provides feedback on student perceptions regarding changes made to a health assessment course delivery format. Results of this study were consistent with findings in the literature which reflect that blended learning (BL) fosters flexible and convenient learning opportunities.<sup>[3,5]</sup> BL allowed for greater flexibility for our students during the pandemic, using both in person lab time, online synchronous class time and e-learning. Researchers were not surprised about the number of students who felt they would have performed better in person as opposed to online. Our program is a traditional face-to-face BSN program, and that is what the students are accustomed to. Fostering engagement was the goal of offering frequent synchronous online meetings. Yet, students reported that they were not able to engage or connect with the professor or classmates in the online environment.

There are a variety of e-learning health assessment products currently on the market for nursing students. While the school of nursing adopted the Assessment Technologies Institute (ATI) platform as its standard three years ago, ATI HealthAssess<sup>(TM)</sup> was a new product, and it was the first time being used in our program. Faculty and students experi-

enced a learning curve which likely impacted results. Most students did not find the virtual practice patients helpful, so it might be worth revisiting these assignments in the future.

Based on the survey results, the students reported that they were confident to implement their health assessment skills in the clinical setting. Historically, the school of nursing has not assessed student confidence levels in their skills prior to entering the clinical environment. Therefore, the reported confidence may not represent a variance from previous academic years. Faculty had concerns regarding a BL format for health assessment, but the students clearly feel confident about using their assessment skills in the clinical setting.

Despite our students' expressed preference to more traditional face to face teaching and learning methods, they were able to earn a strong grade in the course, and earn the confidence to perform necessary health assessment skills. These results align with literature reporting that student achievement is as high in the BL environment as when delivered in the more traditional learning environment.<sup>[2,5]</sup> In addition, McCutcheon et al.<sup>[4]</sup> reinforced that teaching clinical skills, in an online environment, is no less effective than by traditional learning methods.

While it may be possible to return to 100% in-person didactic instruction post pandemic, there are benefits to continuing the use of a variety of teaching and learning strategies to

promote diverse ways of learning.

Limitations to this study were the generalizability of a single-institution study and the small sample size. Next steps will be to compare standardized assessment results in this cohort to previous cohorts who experienced our more traditional learning environment.

## 6. CONCLUSION

Health assessment courses are a vital part of a prelicensure nursing program. It is imperative that faculty provide learning activities so that students have the confidence and ability to perform assessment skills. Analyzing students' perceptions about the implemented educational measures utilized will direct future course planning and development of effective teaching and learning strategies in a more BL environment. The convenience, accessibility, and reliability of these resources increase student accountability for their learning as well as help them to prepare for class and lab at their own pace. This pilot study contributes to the evidence that supports that nursing courses can be adapted to a blended learning format. Future research should focus on increasing engagement in a BL environment and continued development of e learning tools that are more user friendly.

## CONFLICTS OF INTEREST DISCLOSURE

The authors declare that there are no conflict of interest.

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