



THE IMPACT OF TECHNOLOGY-ENHANCED LEARNING STRATEGIES ON NURSING STUDENT ENGAGEMENT IN THE CLASSROOM

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Disclosure Statement

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- I have no conflicts to declare.

Purpose of the Study

- To compare sophomore year student nurses' level of engagement with the course and class instruction with their professor. A pre- and post- instructional intervention process was used to evaluate the effectiveness of the use of a technology-enhanced learning activity known as blogging to engage nursing students in the classroom. Students were divided into control groups and intervention groups.

Statement of the Problem

- Does the use of a technology-enhanced learning activity such as blogging answers to proposed questions prior to class attendance increase students' engagement in classroom activities?

Significance of the Study

- It is important to examine the impact of social media on student engagement. With increased exposure and usage by faculty and students, measuring the influence of social media may help to direct the future of nursing education.
- Benner (2010) challenged nursing faculty to seek a more effective approach to nursing education. With the emphasis shifting from critical thinking to clinical reasoning, using case studies to encourage students to prepare prior to class enables the instructor to use class time for expansion and development of this skill.
- Much of the research to date has indicated the importance of engagement leading to a positive impact on learning and clinical reasoning. This can lead to the lifelong implementation of inquiry and learning.

Research questions

- There are four research questions that guided this study.
 - *What knowledge of and prior experience with blogging do sophomore level students report?*
 - *Do student nurses in control groups and intervention groups differ in their level of engagement based on the pre-test and post-test?*
 - *How do student nurses compare on the pre-tests and post-tests within each group, control and intervention, on their level of engagement?*
 - *What is the relationship of student nurses in control groups and intervention groups on level of engagement, gender and age based on post-test results?*

Review of Literature

- TECHNOLOGY – ENHANCED LEARNING ACTIVITIES
- Connectivism: growth and learning through networking.
- Dumitrescu (2015) : technologies stimulate users' intelligence and enrich their online experience through participation in a wide variety of activities.
- Various learning activities utilized in literature : iPad, Facebook, use of blended classroom approaches.
- Digital literacy: ability to understand information and to evaluate and integrate it into multiple formats (Glister, 1997).

Blogging

- A social networking technology that works well with education because it has interactive, reflective and collective attributes (Baird & Fisher, 2005).
- Abe & Jordan (2013): use of blogging encourages students to interact with one another and has the potential to increase engagement and interest in course content.
- Maag (2005): Encourages self-directed vs. teacher-directed learning, provokes self-reflection as a model of social experience and self-identity and develops the process of learning.
- Studies: Al-Fadda & Al-Yahya (2010) used a blog assignment and found that blogging was effective and encouraged reading.
- Davi, Frydenberg & Gulati (2007) posted discussion questions for blog responses.

Student Engagement

- John Dewey (1916) first proposed that student engagement is essential to the learning process.
- Bruce, Omne-Ponten, and Gustavsson (2010) analyzed active and emotional student engagement in Swedish nursing students. They found that student engagement resulted in a “spiral of gain” that enabled students to access the resources available and increase ability to deal with college stressors.
- D’Souza et al (2013) explored engagement in nursing students in Oman. They found that active and collaborative learning strategies should be used in classrooms .
- Salamonson, Andrew, & Everett (2009) found that the amount of time students spend in learning –related activities correlated to academic engagement.

Educational Principles

- Paolo Freire (1970) promoted a dialogue between the teacher and students to encourage critical thinking.
- Malcolm Knowles (1970) developed the notion of adult-focused education he called andragogy. The learner was seen as a more active participant.
- Banning (2008) identified metacognition as the process that nurses need to use for clinical reasoning and reflection.
- Constructivism addresses the transfer of learning responsibility from the teacher to the student. Handwerker (2012) points out that the use of case studies are evidence of linkages to this theory.

Net Generation

- Students born after 1980 have never known life without the internet.
- 147 out of 153 students were in this group.
- Baird and Fisher (2005) point out that they are “always -on” and expect to utilize technology in their learning.
- Arhin and Cormier (2007) state that these students prefer to be active participants in learning.
- Worley (2011) points out that they are social and team oriented. They look for constant feedback and have interpersonal skills that work well in groups.
- Blogging on a social media platform allows students to post answers while providing an avenue for feedback.

Clinical Reasoning

- Benner (2010) states there needs to be a shift in presentation from didactic and memorization to clinical reasoning skills that will give the graduate the ability to function in a rapidly changing health care system.
- Lindquist and Long (2011) assert that technology has an unfulfilled potential to become a cognitive tool that advances clinical reasoning skills.
- Levett-Jones et al (2010) encourage nursing education to provide students with opportunities to reflect on and question their preconceived notions and prejudices.
- Proficient practice needs skills as well as the ability to think like a nurse.

Research Method and Design

- Quasi-experimental study with a pre and post test interventional design.
- Sophomore student participants enrolled in a fundamental nursing course.
- Classes were divided into three control groups and three intervention groups. Control groups took the course as historically offered without blogging. The intervention groups had a blogging assignment each week over an eight week period.

Population and Sample

- Conducted in a private four year college in New York. There were 153 students enrolled in the course during the spring semester.
- Population was a convenience sample of sophomore nursing students who self-registered for fundamentals of nursing course. Classes were randomly apportioned as to control and intervention status. Involvement in study was voluntary and participants remained anonymous.
- Permission obtained from the Molloy College Institutional Review Board.
- Professors were educated as to how to assign and assess the blogging assignment.

Data Collection

- Adapted Engaged Learning Index and demographic survey was used with permission from Dr. Popkess who had adapted this version from the Engaged Learning Index by Schreiner and Louis.
- The pre-tests were distributed and collected during the first week of classes by the researcher.
- The intervention classes participated in pre-class blogging assignments for a total of five weeks.
- The post-testing was conducted during the eighth week of the semester by the researcher.

Blogging Assignment

- **INFECTION CONTROL**

- Case study scenario: You have been assigned to work on a medical-surgical unit in a local hospital. The patients on the unit have a variety of diagnoses ranging from infectious diseases to orthopedic injuries.
 - What roles might you play in the chain of infection?
 - Why are emerging infections of special concern in healthcare?
 - Consider your current lifestyle. How would you evaluate your ability to support your body's defenses?
 - Identify at least three ways patients can avoid acquiring an infection while on the unit.

Demographics

- Gender: Control and Intervention groups each had 8 % males and 92% females
- Age: Control and intervention groups had approximately 60% of the students in the 18 to 25 year old groups and 16% were 26 to 35 year olds.

Table 3
College Classification

	Control		Intervention	
	Frequency	%	Frequency	%
Sophomore	35	44.9	35	46.7
Junior	30	38.5	23	30.7
Senior	13	16.7	17	22.7

Table 4
Prior learning experience

	Control		Intervention	
	Frequency	%	Frequency	%
High School	31	39.7	25	33.3
Some college	14	17.9	15	20
Associate's	18	23.1	16	21.3
Baccalaureate	14	17.9	16	21.3
Master's	1	1.3	3	1.3

Table 5
Hours Studying Per Week

	Control		Intervention	
	Frequency	%	Frequency	%
None	2	2.6	2	2.7
1 - 7	59	75.6	42	56
8 - 15	14	17.9	26	34.7
16 - 21	3	3.8	4	5.3
More than 21			1	1.3

Table 6
Web 2.0 Application Experience

	Control	Intervention
	Frequency	Frequency
Facebook	69	57
Twitter	36	23
Blogging	10	4
Instagram	59	57
Blackboard	14	9

Table 7
Grade Point Average

	Control		Intervention	
	Frequency	%	Frequency	%
A (3.8 - 4.0)	17	22.4	8	11
A- (3.5 - 3.79)	16	21.1	27	37
B+ (3.2 - 3.49)	22	29	24	33
B (2.8 - 3.19)	20	26.3	12	16.4
B- (2.5 - 2.79)	1	1.3	1	1.4

What knowledge of and prior experience with blogging do sophomore level students report?

Table 8
Comfort level with technology

	Control		Intervention	
	Frequency	%	Frequency	%
Very comfortable	47	60.3	57	76
Somewhat comfortable	18	23.1	14	18.7
Comfortable but learning	13	16.7	4	5.3

Table 9
Blogging experience

	Control		Intervention	
	Frequency	%	Frequency	%
Yes	10	12.8	21	28
No	68	87.2	54	72

Do student nurses in control groups and intervention groups differ in their level of engagement based on the pre-test and post-test?

- No significant difference was found based on the Adapted Engaged learning index tool. A decision was made to obtain the statistics based upon the original version of the tool.
- A factor analysis was performed on the original version by Schreiner and Louis. Questions were separated into those that reflected the cognitive, behavioral and affective arenas. The Cronbach's alpha on the 10 items was 0.815. However, each individual arena did not have a high Cronbach's alpha report.
 - *Behavioral* = 0.615
 - *Affective* = 0.605
 - *Cognitive* = 0.442

Analysis

- Using an independent t-test with equal variances assumed:

Table 11 *Statistical analysis of mean scores*

Group	Prescore	SD	Postscore	SD	t-value	Significance
Control	45.36	7.61	42.97	6.71	-1.607	.110
Intervention	47.23	6.48	43.35	8.45	-1.574	.118

How do student nurses compare on pre-tests and post-tests within each group on their level of engagement?

- The control group started the study at a mean score of 45.36 out of 60. The median value was 46 with a minimum of 17 and a maximum score of 60. at the time of the post-test, the mean had declined to 42.97 with a median of 43.5. the minimum score had increased to 24 but the maximum lowered to 54.
- The intervention group started the study with a mean score of 47.23. The median value was 48. The minimum score was 17 and the maximum score was 59. At the time of the post-test, the mean had declined to 43.35 with a median value of 45.

Group	Pretest mean	Pretest median	Pretest range	Post test mean	Post test median	Post test range
Control	45.36	46	17 to 60	42.97	43.5	24 to 54
Intervention	47.23	48	17 to 59	43.35	45	10 to 54

What is the relationship of student nurses in control groups and intervention groups on level of engagement and gender and age based on post-test results?

Age	N	Engagement	Standard Deviation	Minimum	Maximum
18 to 25 yrs.	112	43.0982	6.70479	22	54
26 to 35 yrs.	23	46.1739	4.21741	36	54
46 to 60 yrs.	1	51			

Gender	N	Engagement
Females	125	44.024
Males	16	41.625

Faculty Response

- The three professors who participated in the intervention had a very positive response to the experience.
- Used blogs as teaching points and found the students were more prepared to discuss the topics assigned.
- One professor mentioned that students responded to each other's postings.
- All professors planned on continuing the assignment in future courses.

Limitations

- This study was the first time the ELI/AELI was used in an intervention study. The reliability may have suffered when used in an intervention format.
- Findings may not be generalizable since it was conducted at one collegiate setting.
- Course had many components and therefore, isolating the impact of a blogging assignment as increasing engagement became difficult.
- Lack of consistency in regard to lecture professors.

Recommendations for further research

- Use of a lecture only course for a full semester.
- Addition of open-ended questions so that students could further explore their feelings and attitudes regarding blogging and learning.
- Survey or interview clinical faculty to see if clinical reasoning skills increased.
- A tutorial on blogging should be provided to students so they all have the same information about blogging.
- Classes should be taught by same professor to maintain consistency.
- Conduct study with multiple collegiate sites to increase generalizability.
- Explore different technology-enhanced learning activities with student-centered formats.
- Develop an instrument that can adequately measure classroom engagement.

Conclusion

- This quasi-experimental intervention research study examined the impact that technology-enhanced learning activities such as blogging may have on engagement in the classroom. While statistically the findings were not at a significant level, the curricular design of using an active learning strategy remains a viable option.
- The net generation prefers a creative environment that incorporates technology and group interaction.
- The future of health care calls for nurses who can clinically reason through a case scenario and provide quality care to their patients. Lecturing in a classroom and expecting the students to absorb the information and use it in the clinical setting is no longer responsive to the student population.
- Engaging students in the learning experience is imperative to ensure that they will think like a nurse.

