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Online Course Engagement Among Undergraduate Nursing Student Veterans

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Abstract

As a result of the Post-9/11 Veterans Assistance Act, academic programs aimed at assisting student veterans to become Registered Nurses (RN) are increasing. Accordingly, the number of nursing academic programs being offered online are increasing, yet little is known about online student veterans' behaviors within learning management systems (LMS). This study examined the patterns of LMS use among student veterans who are pursuing a Bachelor of Science in Nursing (BSN) and the association between these behaviors and academic success. A retrospective associational analysis was conducted with data collected from students enrolled in courses in an online BSN program. The multilevel data consisted of 528 students who took one or more of twelve courses. The sample consisted of 23 veterans and 505 non-veteran BSN (non-VBSN) students in 3,793 course enrollments. Veterans were more likely to be male and were less likely to be classified as an in-state resident. Overall, the students engaged in their LMS early and most did not have missing or late assignments. The amount of online time spent in each course and the number of late assignment submissions significantly predicted course grades. No other significant predictors of graduation, discontinuation, or grades emerged. Notwithstanding some demographic differences, veterans appeared to be comparable to their non-VBSN counterparts overall, in terms of both academic performance and online engagement. These results indicate that the time students spend in their online courses can predict program success. The creation of an early-identification process for at-risk students who are not engaging in their LMS might have the potential to enhance educational outcomes even further.

Keywords: nursing education, undergraduate, online, learning management system, persistence

Introduction

For the past 70 years, various forms of the GI Bill have provided post-service benefits for members of the United States (U.S.) military. These bills have offered additional financial support and education to facilitate the re-entry of service members into society and the civilian workforce. The first GI Bill was the Servicemen's Readjustment Act of 1944, which was signed into law by President Franklin D. Roosevelt and administered by the U.S. Department of Veterans' Affairs (VA). This initial bill offered education and training, unemployment pay, and loan guaranty for homes, farms, or businesses to World War II veterans (U.S. Department of Veterans Affairs, 2013). In 1984, the GI Bill was revamped by congress. Known as the Montgomery GI Bill, interested service members were required to opt into the program, to complete at least two years of active duty, and to forgo a portion of their monthly pay in order to receive benefits (U.S. Department of Veterans Affairs, 2013).

In 2008, the U.S. Congress authorized the Post-9/11 Veterans Assistance Act, which offered support for educational expenses to two million military veterans from the Iraq and Afghanistan conflicts (U.S. Department of Veterans Affairs, 2017b). Also known as the Post-9/11 GI Bill, this Act provided an opportunity for veterans to pursue their educational goals in multiple ways, including earning undergraduate or graduate degrees. Based on their active duty service history, these veterans are eligible to receive various forms of financial support for their education, such as payment of

tuition and fees, an allowance for books and supplies, and in some cases, a monthly housing stipend (U.S. Department of Veterans Affairs, 2017b).

In 2016, 790,090 beneficiaries received educational assistance under this Act totaling $11,583,408 (U.S. Department of Veterans Affairs, 2017a). In 2017, Congress passed the Colmery Veterans Educational Assistance Act, also known as the Forever GI Bill. This legislation broadens the education benefits for veterans, service members, their families, and survivors. Together, these Acts will continue to promote the pipeline of veterans who are seeking to further their educational goals (U.S. Department of Veterans Affairs, 2018).

Review of Literature

Many research studies have been conducted that focus on veterans who are choosing to pursue educational goals. This review of literature provides a review of the reasons for veterans' pursuit of higher education after military service. It describes some of the challenges and unique characteristics of student veterans and the actions taken by institutions of higher education to assist them. In addition, a review of the nursing-specific literature is offered to highlight why veterans may choose to study nursing. The availability of face-to-face, hybrid, and online nursing programs as options for those who wish to pursue an undergraduate nursing degree is discussed, and a summary of research regarding online student behavior within learning management systems (LMS) and course-level success is provided. Little is known about the LMS-related behavior of online undergraduate nursing students, or how these data could be used to predict course-level academic performance and progression to graduation. This section concludes with a description of the online baccalaureate nursing program where the study was conducted.

Veterans value the opportunity provided by these legislative acts to pursue their educational goals. Service personnel report becoming interested in obtaining an education at key points in their military careers. For some, this interest occurs before entering the military or as a part of military promotion. Others may experience an increased interest in pursuing their educational goals in anticipation of the transition to civilian life (Wilson, Smith, Lee, & Stevenson, 2013). Education can be a bridge between military and civilian life for student veterans. After leaving the military, colleges and universities assist student veterans to combine their military skills and training, prior college experiences, and new coursework into meaningful credentials. These credentials can enhance the student veteran's transition into the civilian workforce in the field of their choosing (Wilson, 2014).

Although student veterans value education, they face challenges when they begin working on their academic goals after military service. The purpose and structure of the U.S. military is significantly different from that of colleges and universities. For some student veterans, these differences make adaptation to academic life difficult (Naphan & Elliot, 2015). Academic life is typically less structured and follows a different set of protocols than the military. Some student veterans report that the loose structure of college can be particularly challenging (Livingston, Havice, Cawthon, & Fleming, 2011). The process of creating friendships and community in academic settings can also be different from student veterans' experiences in the military. Using qualitative research methods, Osborne (2013) found that student veterans described their departure from military service and subsequent enrollment in higher education as a process characterized by isolation. They experienced an unanticipated loss of community and camaraderie that was created through military service and combat deployment. Creating a new social network in an academic environment can be perceived as challenging by student veterans (Wilson et al., 2013; Osborne, 2013)

Veterans who return to school have unique characteristics that are based on their military experiences. They are typically older and more mature with life experiences that shape who they are

as students and members of the academic culture (Allen, Armstrong, Saladiner, Hamilton, & Conrad, 2014). They bring strengths developed in the military to their academic life that include perseverance, valuing teamwork, global awareness, and increased self-efficacy (Allen et al., 2014; Dyar, 2015). Depending on their military assignment, experiences, and length of service, some student veterans may experience difficulty adapting to civilian and academic life and may need assistance with creating a new identity. In addition, they may also be recovering from physical and mental injuries that occurred during their military service (Rumann & Hamrick, 2010; Barry, Whitemann, & Wadsworth, 2014).

Norman and colleagues (2015) identified that problems with student veteran integration into academic life were positively correlated with symptoms of PTSD, anxiety/depression, and lower quality of life. Additional obstacles to academic success in their study included worries that the student veterans did not have the needed skills to succeed in school and financial concerns. According to the American Council on Education (2012), the most common challenges facing military and student veterans are finances, social acculturation to academic life, and student retention/degree completion.

Many colleges and universities are aware of the unique characteristics of student veterans and are interested in assisting them as they return to the academic environment. Postsecondary schools can earn a military-friendly designation through the creation of specific policies and with dedicated departments and staff who are available to promote student veterans' success (Viqtory, 2018). A military-friendly college understands that student veterans are transitioning from the professional military environment to the workforce and that academic work can be part of that transition. In an attempt to become more accommodating to veterans utilizing their benefits from the Post-9/11 GI Bill, academic institutions report offering specialized financial and academic advising with the awareness that the initial transition may be the most difficult time for these students (Wilson, 2014). They may develop additional programs to assist student veterans with academic success and provide specific campus-based social or cultural events to help student veterans connect with each other (Osborne, 2013; Barry et al., 2014).

Some colleges and universities offer college credit for previous military training and encourage the use of career or personal counseling (Naphan & Elliot, 2015). Colleges and universities can also choose to provide professional development for staff and faculty on the personal and academic issues faced by student veterans. Professional development programs for faculty that are described in the literature often include: understanding military and veteran culture, supporting student veterans in the classroom, ways to communicate with veterans, and understanding visible and invisible wounds created by military service and war (Dyar, 2015; D'Aoust, Rossiter, Itle, & Clochesy, 2016; Morrison-Beedy & Rossiter, 2018)

When returning to school, student veterans choose to pursue a nursing degree for a variety of reasons. They may have previous military experience as corpsmen, medics, or heath care specialists. They may have functioned as first responders, assisted in evacuations or medical transport, worked in clinic or hospital settings, or helped in humanitarian efforts (Allen et al., 2014). These healthcare skills and experiences are valuable, and student veterans can build upon them as they pursue a nursing degree. According to the U.S. Department of Labor (2018), employment of registered nurses is expected to grow by 15% between 2016 and 2026. Employment growth in nursing can represent potential employment and financial security for the student veteran. The addition of student veterans who chose to study nursing helps to meet the projected need for more nurses in the U.S.

Since 2012, the number of students taking online courses in the U.S. has increased with each year. In 2017, approximately 30% of all U.S. students in higher education are taking at least one distance (or online) course; half of these students describe themselves as being exclusively online

(Seaman & Seaman, 2017). Schools and colleges of nursing may choose to offer their courses to students in multiple educational formats, including traditional in-person settings, online, and blended or hybrid educational settings (American Association of Colleges of Nursing, 2018). The number of student veterans taking online courses in nursing programs is currently unknown.

Offering a choice to complete an online Bachelor of Science in Nursing may be attractive to student veterans. Online learning is often characterized as being personalized and flexible because of the learner's ability to choose when, where, and how often they engage with course materials. While online courses offer time management and location flexibility to students, the unstructured environment and lack of traditional face-to-face accountability that characterizes online courses may not always benefit student veterans (Klingsieck, Fries, Horz, & Hofer, 2012; Goda et al., 2015). One study found that student veterans preferred in-seat classes to online courses, reporting that the in-seat format gave them a better connection with their instructors and classmates (Hembrough, Madewell, & Dunn, 2018). No studies have been conducted regarding student veterans' preferences for studying nursing in online, hybrid, or face-to-face settings.

Good time management is important to the success of students seeking higher education using online formats. Jo and colleagues (2015) identified that time management strategies of adult online learners are reflected in their behaviors, which can be captured in learning management systems. Delays in course enrollment and in timing of students' first posting in an online accounting class discussion board and delays in accessing weekly lecture material for an information science course were negatively related to students' course letter grade (McElroy & Lubich, 2013). An analysis of master's level library science students in four online classes, demonstrated a negative relationship between the number of days students delayed in accessing weekly lecture materials and their final course grade; and that an increased number of discussion board postings had a positive correlation with the final course grade (Zhang, 2016). You (2016) identified that the timing of undergraduate students' access of course information documents, the frequency of their course logins, and the number of assignments submitted after the deadline in a fine arts elective, significantly predicted their course achievement.

Little is known about the behavior of online veteran nursing students within the learning management system (LMS), or how these data could be used to predict academic performance and progression among undergraduate nursing students. Identifying patterns of LMS use in student veterans who are studying nursing, could be useful in order to assist them with academic retention, progression through their nursing program, and attainment of their educational goals. The purpose of this study was to answer the following questions:

1) What are the similarities and differences of LMS engagement among veterans and traditional students who are pursuing an online Bachelor of Science in Nursing (BSN)?
2) Among Veteran BSN and traditional BSN students in an accelerated online nursing program, which LMS usage behaviors predict academic success?

Description of the Program

The purpose of this Health Resources and Services Administration funded initiative was to increase the number of Veterans enrolled in and completing a baccalaureate nursing (VBSN) program. Prior to inauguration of the VBSN program in 2014 at the University of Texas at Arlington (UTA), a screening of nursing enrollees found that some RN matriculates met the requirements for the VBSN program. Specific recruitment activities for the program included postings on the university's website, issuing press releases, and posting on social media to highlight the VBSN option for students who meet the criteria. An advisory board was established for the program including community stakeholders. The advisory board included representatives from the Dallas Veterans

Affairs Medical Center, the healthcare partner for the program and site for the VBSN students' clinical rotations. Members of the advisory board were asked to identify contacts throughout the veterans' community willing to spread the word about the VBSN program. Information sessions were scheduled for veterans' centers both on and off campus. UTA students who had registered "nursing intended" as their desired area of study were contacted and informed about the new program. Academic advisors within the university contacted pre-nursing majors who were identified as veterans and worked with them individually to develop plans to complete pre-requisite courses and be ready to start the program in 2014 and beyond.

Veterans with prior healthcare training were recruited to start the VBSN program at the UTA College of Nursing and Health Innovation (UTA CONHI) in 2014 through 2018. The VBSN students were admitted twice a year (fall and spring) as discrete cohorts in the nursing school's accelerated (15-month) BSN program (termed the Accelerated Online program or "AO"), where content is delivered online and clinical hours are focused at a partner clinical facility.

For both the VBSN and non-VBSN programs, course modules varied from 5-14 weeks in length based on semester credit hours and number of clinical hours required (Cipher, Mancini, and Shrestha, 2017). All courses had the didactic portion conducted online with media-rich, interactive learning elements in condensed modular formats. Full descriptions of the development and implementation of the online programs are provided by (Cipher et al., 2017).

Methods

Student demographic characteristics (gender, race, age, prior degree status)and LMS variables (time to first login, number of late assignments, number of missing assignments, courses grades, and total hours spent in online learning for each course) were collected for AO BSN student cohorts who were enrolled during four semesters: spring 2015, summer 2015, fall 2015, and spring 2016. For each course, time to first login was defined as the time elapsed between the official start date of the course and the time that the student logged into the course for the first time. Because the courses were available to students prior to the official start date, students could have logged in prior to the start date, on the day of the start date, or after the start date.

LMS data were captured for the following courses: Clinical Nursing Foundations, Holistic Health Assessment-Lifespan, Nursing of Adults (Med/Surg), Psych/Mental Health Nursing, Nursing of Older Adults, Nursing Research, Nursing of Childbearing (OB), Nursing of Children and Adolescents, Nursing of Adults with Complex Needs, Community Health Nursing, Capstone: Transition to Professional Nursing, and Professional Nursing Trends. The data capture consisted of four consecutive semesters only; therefore, not all students in the dataset took all twelve courses. The mean number of courses completed by each student within the period of data capture was 7.1 (SD= 4.3).

Students in the study sample were followed to completion that resulted in either graduation, discontinuation, or failure. Discontinuation was defined as the failure to enroll in courses for an entire calendar year (365 days). No currently enrolled or progressing students were included, nor were any students who switched to an in-seat program. This study was deemed exempt by the UTA's Institutional Review Board.

Measures

The Health Education Systems Inc Admission Assessment, or HA^2, consists of component exams designed to assess prospective students' readiness for higher education in nursing and other fields (Elsevier Student Life, 2015). Students' HA^2 scores for the math, grammar, reading, and vocabulary exams were obtained from UTA's records for the purpose of this study. HA^2 exams utilize

a computer-based administration platform and vary in the number of items and amount of time allotted per exam. Scores range from 0–100 % on all HA^2 component exams. Reliability coefficients have been reported at .99 for each of the HA^2 exams used in this study (Murray, Merriman, & Adamson, 2008).

Statistical Analysis

Continuous parameters are reported as mean, median, standard deviation, and discrete parameters were reported as n and percent (%). Tests of normality were performed with the Shapiro-Wilk test. Mann-Whitney U tests were computed for comparisons of continuous variables, and Pearson chi-square tests were computed for nominal variables. Generalized linear mixed models (GLMM) with logistic link functions were computed to examine the association between cohort (VBSN versus non-VBSN), time to first login, number of missing assignments, number of late submissions, time spent in online learning for each course, and binary outcomes (progression to graduation and discontinuation). Linear mixed models were computed to examine the association between the predictor variable set and course grades. Each of the predictors were significantly non-normally distributed and were subsequently transformed to quintiles prior to submission to the analyses. The GLMM and linear mixed models allowed and accounted for multiple occurrences of students within courses and accommodated correlated observations. Multicollinearity diagnostics were computed and assumptions were met for all regression models. Course grades were coded as F=0, D=1, C=2, B=3, A=4. The study alpha was set to .05. Analyses were performed with SAS 9.4 for Linux with the "PROC GLIMMIX" procedure.

Results

The cohort analysis consisted of 505 non-VBSN students and 23 VBSN students. The dataset consisted of a total of 3,793 course enrollments over four semesters (spring 2015, summer 2015, fall 2015, and spring 2016). The demographic characteristics of the sample are displayed in Table 1. The majority of the sample was female (80.1%) and the mean age was 31.9 ± 7.1 years. The most common racial identity reported was white/Caucasian (50.6%), followed by Black/African-American (20.3%), Asian (6.4%), and 17.8% were Hispanic/Latino. Over one-third of the sample had earned no prior academic degree at the time of enrollment (37.3%), while 45.3% enrolled with a bachelor's degree in another field.

Most of the students (96.4%) graduated from the program, and the remaining students either discontinued (2.1%) or failed out of the program (1.5%). Those who graduated were compared to those who did not graduate on demographic and enrollment variables to better understand the profiles of students who did not persist. Graduates were significantly more likely to identify as non-minority white ($\chi^2(1) = 3.94$, p=.047 (51.6% versus 27.8%), but did not significantly differ on other self-reported racial identities including Hispanic, Asian, and Black/African-American. There were no significant differences in age, gender, previously earned degrees, or in-state residency at enrollment. However, graduates had significantly higher scores on three of the four HA^2 entrance exams (grammar, p=.027; reading, p= .002; and vocabulary; p=.008).

Aim 1: What are the similarities and differences of LMS engagement among Veterans and traditional students who are pursuing a Bachelor of Science in Nursing (BSN)?

The VBSN cohort was compared to the non-VBSN cohort on demographic variables and admission variables. As shown in Table 1 below, VBSN students consisted of significantly more males (47.8% versus 18.6%; p <.001) than the non-VBSN cohort and they were significantly less

Table 1
Demographic and Academic Characteristics at Enrollment

	Non-VBSN (n= 505)	VBSN (n= 23)	Whole Sample (N = 528)	p
Age, $\bar{X}$(SD)	31.8 (7.2)	33.5 (6.9)	31.9 (7.1)	.15
Male, n (%)	94 (18.6%)	11 (47.8%)	105 (19.9)	.001
Ethnicity*				
White	258 (48.9%)	9 (39.1%)	267 (50.6%)	.254
Black/African American	100 (18.9%)	7 (30.4%)	107 (20.3%)	.225
Hispanic/Latino	89 (16.9%)	5 (21.7%)	94 (17.8%)	.614
Asian	33 (6.3%)	1 (4.3%)	64 (6.4%)	.631
Associates Degree at Enrollment	86 (17%)	6 (26.1%)	92 (17.4%)	.263
Bachelor's Degree at Enrollment	233 (46.1%)	6 (26.1%)	239 (45.3%)	.059
Master's Degree at Enrollment	10 (2%)	0	10 (1.9%)	.496
In-state Resident	494 (97.8%)	20 (87.0%)	514 (97.3%)	.002
HA^2 Entrance Exams				
HA^2 Grammar	89.2 (8.9)	85.8 (19.6)	89.1 (9.6)	.893
HA^2 Reading	88.9 (8.7)	86.2 (19.4)	88.8 (9.4)	.88
HA^2 Math	90.6 (9.5)	85.2 (20)	90.3 (10.2)	.15
HA^2 Vocabulary	86.8 (9.6)	84.7 (19.4)	86.7 (10.2)	.618

** 26 (4.92%) students identified as "other" or did not specify their ethnicity*

likely to be classified as an in-state resident (86.9% versus 97.2%; p =.002). The two groups did not significantly differ in their age or ethnic composition, nor did the groups significantly differ in performance on the HA^2 grammar, reading, math, or vocabulary entrance exams.

As shown in Table 2 (below), the mean course grade was 3.3 (SD=7.2), indicating that the average course grade was a "B". Analyses of data for each course indicated that many students (more than 50%) logged into the LMS prior to the official start date (the median time to login for all classes was three days prior to start date).

Table 2

Academic Performance and Persistence Variables

	Non-VBSN (n= 505)	**VBSN (n= 23)**	**Whole Sample (N = 528)**	***p***
GPA Last Term, $\bar{X}$(SD)	3.2 (.4)	3.1 (.3)	3.2 (.4)	.153
Time to Graduation, $\bar{X}$(SD)	1.5 (.2)	1.5 (.2)	1.5 (.2)	.151
Graduated, n (%)	487 (96.4%)	22 (95.7%)	509 (96.4%)	.844
Discontinued	11 (2.2%)	0	11 (2.1%)	.474
Failed	7 (1.4%)	1 (4.3%)	8 (1.5%)	.255

As shown in Table 3 (next page), missing assignments were rare, as were late assignment submissions (the median for all classes was 0 missing assignments and 1 late submission). The mean time spent per course was 68 hours with a large variability (SD = 59.5). GLMM analyses indicated no significant differences between the VBSN and non-VBSN students on any of the LMS variables.

Table 3
Learning Management System Variables by Cohort

	Non-VBSN			VBSN			Whole Sample			
	Mean	Median	SD	Mean	Median	SD	Mean	Median	SD	*p*
Number of Late Submissions Per Course	1.8	1.0	3.3	1.5	1.0	2.8	1.8	1.0	3.3	.886
Number of Missing Assignments Per Course	0.6	0.0	1.6	0.4	0.0	1.0	0.6	0.0	1.5	.833
Number of Days Elapsed Between First Login and Official Course Start	-2.2	-3.0	3.3	-2.2	-3.0	1.5	-2.2	-3.0	3.2	.939
Number of Hours Spent Per Course	67.7	52.4	56.5	74.2	42.8	105.5	68.0	51.9	59.5	.988

Aim 2: Among Veteran BSN and traditional BSN students in an accelerated online nursing program, which LMS usage behaviors predict academic success?

Linear mixed models indicated that the time spent in each course and the number of late submissions significantly predicted course grades, while cohort, missing assignments, and time to first login did not significantly predict course grades. Longer course engagement ($p<.001$) and fewer late submissions ($p<.001$) were associated with higher course grades. The GLMM analyses indicated that the LMS predictors did not significantly predict the likelihood of graduation nor the likelihood of discontinuation. However, GLMM analysis indicated that grades significantly predicted both graduation ($p<.001$) and discontinuation ($p<.001$), indicating that grades are likely to serve as a mediator between online engagement variables and persistence.

Discussion

Retrospective analyses of 528 students in 12 courses representing 3,793 course enrollments in an accelerated online BSN program, revealed that veterans were comparable to their non-veteran counterparts in graduation, discontinuation, and course grades. The graduation rate in this sample was 96.4%, which is higher than previously published national graduation rates of BSN completion programs (NLN, 2016). This particular analysis reveals that the discontinuation rate (2.1%) was lower with the national average, and the percentage of students who had failed out of the program was extremely low (1.5%). Overall, VBSN students were demographically similar when compared to the non-VBSN students. VBSN students were significantly more likely to be male but were similar with regard to age, degree history, and ethnicity.

This study's findings revealed that more time engaged in a course and fewer late submissions predicted higher course grades, and in turn, course grades predicted persistence to graduation. For academic nursing instructors and leaders, this finding is intuitively true. However, in this sample, academic coaches play a supporting role with online students using targeted actions that are taken for early recognition and intervention (Cipher, Urban, & Mancini, 2018). In many other academic settings where undergraduate nursing programs are offered, faculty must work independently to provide support to an increasing number of students.

This study found that higher numbers of late submissions significantly predicted lower course grades. This is similar to the findings of You (2016), who found that the number of late assignments was associated with lower final course grades. However, there was no association between missing assignments and course-level outcomes. Moreover, missing assignments were rare, with most students having zero missing assignments in each course within their BSN program. This finding could be attributed to the program's use of academic coaches, who served as a liaison between the faculty of record and the students. Coaches monitored student engagement, managed discussion boards, assisted with grading, provided online student support, and regularly collaborated with university faculty. In the AO BSN program, academic coaches regularly corresponded with students to ensure that they were progressing and submitting assignments on time (Cipher et al, 2018).

An additional finding from was that there was no significant association between early engagement as represented by time to first login and course grade nor the likelihood of graduation. Early engagement is a variable of interest that can be operationalized by identifying and measuring specific student behaviors within an LMS. Early engagement has been described and measured in several ways in the recent literature, including time of course enrollment, accessing initial course documents, time of first assignment submission, and even the amount of time spent in the LMS during the first week of a course. Often, these student behaviors are positively associated with course-level outcomes (McElroy & Lubich, 2013; You, 2016; Zhang, 2016). Perhaps as Jo and colleagues (2015) have suggested, it is the regularity or steadiness of the learning intervals logged by a student over time in the LMS, reflecting the student's time management, which truly predicts course performance.

Limitations

Limitations of the study included the single-site program sample as well as the retrospective study design. The study sample was selective and was only composed of students who took a nursing course in one or more of four semesters, the results of which may yield limited external validity. The sample consisted of only 23 VBSN students, which may yield limited generalizability to other nursing student veteran samples. Details regarding progression and retention, such as specific reasons for discontinuation, might have assisted in the explanation of the outcomes.

Strengths of this study are the granular level of unique, multilevel data from an understudied group.

Recommendations

Developing a research-based understanding of the association between online student behaviors in an LMS to course-level outcomes based on published studies is still in its infancy. More research needs to be conducted to identify which additional online undergraduate nursing student behaviors within a LMS can be used as a proxy for student engagement and whether these behaviors best predict course and program level outcomes. Among online undergraduate nursing students who are required to access nursing courses in an LMS, is there an early engagement behavior, or even a "just right" time for engagement, that can consistently predict course and program level outcomes? Are there differences between veteran and non-veteran online students on these additional variables?

The key variables identified in this study across multiple courses in an online BSN program that were associated with higher course grades, were more time spent in course engagement and fewer late submissions. Further research is needed to determine if these analyses would replicate in other online programs or with larger student veteran samples. Additional variables that could be utilized in future studies include the timing of: initial access of important course information documents (ie. a course syllabus and schedule), submission of discussion board posts, and submissions of key assignments or exams. When comparing predictors across courses in a nursing program, the challenge for researchers includes the identification of common variables that can be used consistently across courses in a nursing program.

As noted in the review of literature, student veterans have unique characteristics, strengths, and challenges that can affect academic progress. More research is needed to explore whether past service-related experiences may have an effect on student veteran's choices of nursing school format (online vs. hybrid or face-to-face). It is unknown if there are differences in LMS behaviors among student veterans in each of these nursing school formats. Additional prospective studies are needed to explore the variables that contribute to student veterans' progression and success in nursing school when previous experiences with anxiety/depression and PTSD are present.

Conclusion

Analyses of nursing student veterans in an accelerated BSN program, revealed that the veterans, with some notable demographic differences, appear to be similar to their non-veteran counterparts in terms of online course engagement, grades, and persistence. With the recent rapid increase in online nursing programs, it is important that we more fully understand the online educational experiences of students in online undergraduate nursing programs. The results of this case study indicate that the creation of an early-identification process for at-risk students who exhibit low levels of online engagement would have the potential to enhance educational outcomes even further. Research that contributes to a shared understanding of the student success behaviors of online nursing student veterans is important. It will help to create RNs with a unique understanding of the health care needs of veterans and assist in meeting the projected need for more nurses in the U.S.

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