MODIFYING THE STUDENT COURSE ENGAGEMENT QUESTIONNAIRE FOR USE WITH ONLINE COURSES

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ABSTRACT

The purpose of this study was to modify the Student Course Engagement Questionnaire (SCEQ) for use in varied teaching settings, including online graduate courses. The SCEQ-M was administered to 276 students enrolled in a variety of graduate-level education and counseling courses during the Spring 2016 semester. An exploratory factor analysis (EFA) using Maximum Likelihood identified four dimensions in the modified scale: Applied Engagement, Goal-Oriented Engagement, Self-Discipline Engagement, and Interactive Engagement. The SCEQ-M scores showed good internal consistency reliabilities ranging from .71 to .81. This study found that this instrument may be used to compare student engagement styles and suggests that instructors should seek to improve student engagement to better match engagement style to type of course. Other findings and implications for future research are also discussed.

Keywords: student course engagement; factor analysis; online and on-campus instruction; graduate education

INTRODUCTION

Face-to-face instruction delivered in on-campus classrooms has a long tradition in higher education, especially in graduate-level education where immediate and direct interaction between students and faculty is considered to be the centerpiece of student learning. With ubiquitous and affordable access to the internet, however, college instruction is increasingly being delivered "at a distance" in online courses that may or may not be live or synchronous. The growth of both synchronous and asynchronous online instruction continues at an increasing rate (Rockinson-Szapkiw, Wendt, Wighting, & Nisbet, 2016). Online modules and full courses are now commonplace, with a growing number of universities implementing fully online degree programs. From 2013 to 2014, Allen and Seaman (2016) stated "the number of distance students at both undergraduate and graduate level increased steadily each year. A year-to-year 3.9 percent increase in the number of online students is evidence of the rise of online learning" (p. 4).

The reasons for the increase in online instruction include economic downturn, changes to budget structures in higher education, and the cost-effectiveness of online education in comparison to traditional courses (Cowen & Tabarrok, 2014). The pressure for more cost-effective and flexible modes of course delivery creates an increased interest in determining how online education compares to traditional in-classroom education.

Comparing Online and On-Campus Courses

Dickinson (2017) argued that there is a need for research examining the effectiveness of online courses. A review of the literature indicates that comparisons between online and traditional in-classroom learning have not produced consistent results across studies. For example, a number of studies found that student performance in on-campus and online courses is similar. Cummings,

Chaffin, and Cockerham (2015) compared Master of Social Work programs that offered both online and in-classroom instruction and found that students performed equally well on knowledge attainment, skills development, satisfaction, and self-efficacy, regardless of the type of delivery model. Mollenkopf, Vu, Crow, and Black (2017) also found that graduate students enrolled in either online or traditional courses in childhood teacher education performed equally well on learning outcomes.

Regarding practice-based courses, Kissau (2015) reported that both online and in-classroom graduate students of language education performed equally well on their teaching performance in their internships. Regardless of how students learned to teach (traditional vs online), teacher candidates were able to demonstrate appropriate instruction strategies, class management skills, and rapport with students.

In a recent study, Page and Cherry (2018) found that graduate students in an organizational leadership program performed equally well in online and in classroom settings. In addition, the results reported that both groups were identical in terms of student performance, consistency of course structure and instructions, and faculty-student engagement. Stack (2015) found that graduate students in online and in-classroom criminological theory courses demonstrated similar results in student perceptions of instruction and learning outcomes (i.e., final grades).

Other researchers, however, have found differences between on-campus and online courses. Soffer and Nachmias (2018) found that students enrolled in online courses reported a better understanding of the course structure, communication, lessons watched, engagement, satisfaction, and learning outcomes (final grades and completion rate) than did those in comparable on-campus courses.

Ortega-Maldonado, Llorens, Acosta, and Coo (2017) examined differences and similarities between on-campus and online students in graduate programs. They found that online students possessed higher levels of knowledge, competence, and work self-efficacy beliefs than those in on-campus courses. Also, the results noted that the majority of online students were older and were more likely to have full-time jobs than the on-campus students. Online students appeared to have a wider range of life and work experience, and they practiced better analytical skills than in-classroom students.

Young and Duncan (2014) found that students in an online course were less satisfied with the instructor's teaching effectiveness than those in traditional courses. Specifically, students in the online version expressed dissatisfaction with the communication, faculty-student interaction, grading, instructional methods, and course outcomes. Online students believed that they worked harder, had a higher workload, and experienced more difficulty due to working in an asynchronous learning environment. Kuo, Walker, Schroder, and Belland (2014) assessed course satisfaction among students in online courses and found that it varied depending upon the subject matter; learner-content interaction was the strongest predictor of the students' course satisfaction.

Student Course Engagement

Focusing on student engagement may provide useful information regarding the effectiveness of instruction, whether it takes place in the traditional classroom or online. Research on college students' engagement with their educational experiences has found that educational outcomes are strongly influenced by the level and type of student engagement. Pascarella and Terenzini (1991), in an early summative report of college student engagement, concluded that greater college student involvement, or engagement in academic work, produced concomitant increases in knowledge acquisition and cognitive development. The National Survey of Student Engagement (NSSE) reached a similar and more recent conclusion, stating that " . . . the voluminous research on college student development shows that the time and energy students devote to educationally purposeful activities is the single best predictor of their learning and personal development" (Kuh, 2009, p. 1).

Handlesman, Briggs, Sullivan, and Towler (2005) believed that research into student engagement at the college level tended to be at the "macro-level" that examined collegewide programs and practices and characterized engagement more globally (e.g., overall campus environment or climate) rather than examining the students' engagement with their individual coursework

experience. Therefore, Handlesman et al. (2005) developed the Student Course Engagement Questionnaire (SCEQ) for use at the "micro-level," which they described as " . . . what happens in and immediately surrounding class" (p. 186). The rationale for examining student engagement at the course level is that faculty have the most influence on student learning in the context of their courses. Further, student engagement with classes may vary from class to class and within each class over time in any given course.

The SCEQ is a 23-item instrument designed for use in traditional, on-campus courses measuring four dimensions of college student engagement: a) skills engagement, b) participation/interaction engagement, c) emotional engagement, and d) performance engagement (Handelsman et al., 2005). The SCEQ demonstrated good internal consistency across the four engagement factors; the coefficient alphas ranged from .76 to .82. Evidence of convergent and discriminant validity were also found; the SCEQ scores were positively associated with at least one other external measure of each of the factors and "the different patterns among the variables supported the distinctiveness of the student engagement factors" (Handelsman et al., 2005, p. 189).

Student engagement is an increasingly researched topic in higher education literature, especially in the areas of online or distance education. One area in need of further research is the development of reliable and valid measures of student course engagement that may be used in either traditional or online classes. The purpose of this present study was to modify the SCEQ to allow for its use in either on-campus or online courses and to examine the psychometric properties and underlying dimensions of the modified questionnaire (referred to in this study as the SCEQ-M). In addition, the present study focused on graduate-level rather than undergraduate-level courses.

METHODOLOGY

Participants and Procedure

This study was reviewed and approved by the university's Institutional Review Board (IRB). The participants consisted of graduate students enrolled in either on-campus, online, or hybrid courses held by a university in the Northeastern United States during the Spring 2016 semester. The graduate students were enrolled in courses offered by four departments offering majors in counseling, educational leadership, learning and instruction, and library and information sciences. Initially 1,244 graduate students were contacted via an email sent through the GSE student listserv.

An email explaining the study was sent to all GSE students via the student listserv for the purpose of recruitment, and reminder emails were sent three times following the initial recruitment email. The recruitment emails contained a link to a Survey Monkey web page that was used to obtain consent, administer the SCEQ-M, and obtain participant demographic information. Students were told to self-select one GSE course that they completed during the Spring 2016 semester and to use that course in reference to all of their responses. Participation was anonymous, and those who completed the survey had the opportunity of winning one of ten Amazon gift cards valued at $20 each. After recruitment was complete, data were downloaded from Survey Monkey and imported into SPSS for data analysis.

Instruments

The Student Course Engagement Questionnaire (SCEQ; Handlesman et al., 2005) is a 23-item instrument designed for use with undergraduate students enrolled in traditional, on-campus courses. The SCEQ was found to measure four dimensions of college student engagement with their courses:

a) skills engagement, 9 items that represented student engagement through practicing skills (e.g., taking good class notes),

b) participation/interaction engagement, 6 items that measured the level of interaction with either instructors or fellow students (e.g., helping fellow students),

c) emotional engagement, 5 items that measured the level of emotional involvement with class material (e.g., really desiring to learn the material), and

d) performance engagement, 3 items that measured the level of class performance or learning outcomes (e.g., doing well on tests).

Instructions to complete the SCEQ are: "To what extent do the following behaviors, thoughts, and feelings describe you, in this course? Please rate each of them on the following scale: 1 = not at all characteristic of me, 2 = not really characteristic of me, 3 = moderately characteristic of me, 4 = characteristic of me, and 5 = very characteristic of me." Scores on the SCEQ vary from a minimum of 23 to a maximum of 115 for the entire scale.

Because the SCEQ was designed for use in traditional courses, we modified the original questionnaire to make five of its items more relevant for use by students who are enrolled in either online or hybrid courses. The five items that we modified for this questionnaire follow, with the words in italics indicating the modification:

(Item 1) Raising my hand or answering questions in class,

(Item 2) Participating actively in small group or discussion board discussions,

(Item 5) Coming to class every day or logging on to the class webpage regularly,

(Item 6) Going to the professor's office hours or contacting him/her to review assignments or tests, or to ask questions,

(Item 23) Listening carefully in class or carefully reading online course discussion posts.

In addition to the SCEQ-M, the researchers created a Demographics Questionnaire for this study that asked participants to report their age, gender, major, and enrollment status (full time or part time).

Data Analyses

Before conducting statistical analyses, the data were thoroughly screened to ensure accuracy and completeness, and there were no missing data reported for all items. Next, data from the demographics form were analyzed using descriptive statistics and responses to the SCEQ-M were examined via a confirmatory factor analysis (CFA) using the Statistical Package for the Social Sciences (SPSS) AMOS. Prior to the analyses, we hypothesized that a result of the CFA would replicate the factor structure of the original SCEQ. The CFA analysis, however, indicated that a four-factor structure of the original version of SCEQ failed to replicate the dimensionality of the original factor structure. This situation can occur when the researcher uses different participant populations and/or a different data set (Van de Vijver & Leung, 1997). Thus, it was necessary to conduct an exploratory factor analysis (EFA) to identify a new factor structure for the SCEQ-M when used with a graduate student population enrolled in either on-campus or online courses.

RESULTS

Demographics

Two hundred and seventy-six (276) students responded to the recruitment email and followed the Survey Monkey link to participate in the study; 124 (45%) were enrolled in traditional on-campus courses, 128 (46%) were enrolled in online courses, and 24 (9%) were enrolled in hybrid courses. One hundred and eighty-one students (65.6%) were enrolled in Master's degree programs, seventy-two (26.1%) were doctoral students, seven students (2.5%) were enrolled in advanced graduate certificate programs, and sixteen students (5.7%) did not identify their graduate status. Most were GSE students; however, two (0.7%) were from a Nursing School and School of Business, and 14 (5.1%) were unidentified majors. Participants ranged in age from 22 to 59 years (M = 31.34, SD = 9.17), and 79 (28.6%) were male and 197 (71.4%) were female (see Table 1).

Table 1. Demographic Characteristic of Participants (N=276)

Characteristic	M	SD	Range
Age	31	9.17	22–59
	Frequency (%) n		
Gender			
Male	28.6	79	
Female	71.4	197	
Course Format			
On-Campus	45	124	
Online	46	128	
Hybrid	9	24	
Programs			
Master's	65.6	181	
Doctoral	26.1	22	
Advance	2.5	7	
Graduate Certificate	5.7	16	
Unidentified			

Exploratory Factor Analysis

The exploratory factor analysis of the SCEQ-M items was carried out using Maximum Likelihood. Further, the number of factors to extract was fixed to four, using Oblimin rotation with Kaiser Normalization. Maximum Likelihood was used because the data were normally distributed. In addition, Maximum Likelihood allows for computation of a wide range of goodness-of-fit indexes, permits statistical significance testing of factor loadings and correlations among factors, and computes a confidence interval (Fabrigar, Wegener, MacCallum, & Strahan,1999). The decision to retain four factors was guided by visually inspecting the scree plot, considering the eigenvalues, and balancing parsimony and plausibility. Visual inspection of the scree plot indicated that four factors appeared to be left of the beginning of the scree, with eigenvalues greater than one. Next, we evaluated these factors based on the amount of variance explained, the interpretability, and the cleanness of structure as defined by fewest cross loadings and item loadings above .30 (Costello & Osborne, 2005).

In preliminary analyses, four items had cross loading and/or inadequate loading problems (item loading less than .25), which were removed from the item pool. The remaining 19 items produced adequate loadings, and no item cross-loaded on any factor. The factor analysis resulted in a 19-item final

Table 2. SCEQ-M Factors and Loading from Maximum Likelihood (Pattern Matrix)

Factor Item	**Factor**			
	1	2	3	4
Factor 1: Applied Engagement				
22. Applying course material to my life	.996			
21. Finding ways to make the course material relevant to my life	.472			
11. Really desiring to learn the material	.303			
Factor 2: Goal-Oriented Engagement				
15. Getting a good grade		.695		
13. Putting forth effort		.619		
4. Doing all the homework problems		.583		
16. Doing well on the tests		.561		
5. Coming to class every day *or logging on to the class web page regularly*		.433		
Factor 3: Self-Disciplined Engagement				
10. Looking over class notes between classes to make sure I understand the material			.766	
20. Making sure to study on a regular basis			.685	
6. Going to the professor's office hours *or contacting him/her to review* assignments or tests, or to ask questions			.588	
9. Taking good notes in class			.513	
7. Thinking about the course between class meetings			.411	
17. Staying up on the readings			.371	
Factor 4:Interactive Engagement				
1. Raising my hand *or answering questions in class*				-.800
2. Participating actively in small group *or discussion board discussions*				-.589
3. Asking questions when I don't understand the instructor				-.470
18. Having fun in class				-.372
19. Helping fellow students		.263		-.350

Note: Factor loadings less than .25 are not displayed. Modified item content appears in *italics.*

version of the SCEQ-M. Table 2 shows the factor loadings of the 19 retained items of the SCEQ-M. In addition, the Kaiser-Meyer Olkin value was .84, which exceeds the suggested minimum value of .5, and Bartlett's test was statistically significant ($p < .01$), which also indicated that the data were suitable for factor analysis.

The four factors of the SCEQ-M accounted for 42.73% of the variance and are displayed in Table 3. Factor 1, accounting for 13.64% of the variance, included three items, all of which are drawn from the original Emotional Engagement subscale. Based on the content of the items, we named this factor "Applied Engagement." These three items closely relate with course concepts relevant to students' lives and their emotional involvement with class material (Handelsman et al., 2005).

Factor 2 accounted for 18.47% of the variance and included five items. Two items are from the original Performance Engagement subscale, and three items are from the Skill Engagement subscale. Based on the content of these five items, we named this factor "Goal-Oriented Engagement," which reflect aspects of learning outcomes and goals.

Factor 3 accounted for 6.15% of the variance and included six items. Four are from the original Skill Engagement subscale, one item is from the Participation Engagement subscale, and one item is from the Emotional engagement subscale. Based on the content of the items, we named this factor "Self-Disciplined Engagement."

Finally, Factor 4, accounting for 4.47% of the variance, included five items, all of which are drawn from the original Participation Engagement subscale. Based on the content of the items, we named this factor "Interactive Engagement."

Internal Consistency Reliability

Subscale correlations, descriptive statistics, and reliability estimates for the SCEQ-M appear in Table 3. Reliability estimates were: Total 19-items scale = .861, Factor 1 (Applied Engagement) = .74, Factor 2 (Goal-Oriented Engagement) = .714, Factor 3 (Self-Disciplined Engagement) = .771, and Factor 4 (Interactive Engagement) = .733. The highest correlations among the student engagement factors was .44 between Self-disciplined and Applied Engagement. Of note is the negative correlations found between the Interactive Engagement dimension and the other subscales, which will be further discussed below.

DISCUSSION

The analyses gleaned new information about the factor structure and psychometric properties of the SCEQ-M when used with graduate students enrolled in on-campus, online, and hybrid courses. Exploratory factor analyses yielded a four-factor structure that was labeled: Applied Engagement, Goal-Oriented Engagement, Self-Disciplined Engagement, and Interactive Engagement. Internal consistency estimates of both the overall SCEQ-M as well as its four subscales were very good indicating it may be a useful tool for understanding and assessing student engagement in a variety of graduate course levels (masters and doctoral) and types (online and traditional).

A surprising finding was that the subscale correlations showed Interactive Engagement to be negatively correlated with the other three subscales (Applied Engagement, Goal-Oriented Engagement, and Self-Disciplined Engagement). In other words, the graduate students who were actively communicating and participating with other students in the classroom might be less engaged with learning activity outside of the classroom (e.g., applying course material, reading and doing homework, meeting with professors, etc.). In one study, Liu (2007) found that many graduate students have full-time jobs and do not have ample time for reading course material and other class activities. This study also found that the graduate

Table 3. Correlations, Descriptive Statistics, and Reliabilities of SCEQ-M

Factor	M	SD		Applied Engagement	Goal-Oriented Engagement	Self-Disciplined Engagement	Interactive Engagement
Applied Engagement	4.21	0.86	.74	1.00			
Goal-Oriented Engagement	4.49	0.74	.71	.23	1.00		
Self-Disciplined Engagement	3.79	1.05	.77	.44	.33	1.00	
Interactive Engagement	3.92	1.01	.73	-.28	-.43	-.39	1.00
Total	4.07	0.31	.86	.64	.64	.83	.80

students have stronger preferences for gaining direct experience, working with peers, getting the instructor's help, being independent learners, liking a competitive environment, and setting clear goals. These learning styles clearly matched the items in the Interactive Engagement subscale.

This SCEQ-M may be used as a tool for faculty interested in evaluating student engagement with their courses and its effect on such areas as student retention, adherence to course guidelines, final grades, and other student outcomes. Also, the SCEQ-M may be used as a supplement to traditional course evaluations used to estimate levels of satisfaction and student attendance to improve student-learning outcomes. In sum, a better understanding of the students' engagement with their courses should result in better learning outcomes and greater satisfaction for students.

Limitations

The study has some limitations worth noting. First, this study took place at a single institution and relied on self-selected voluntary participation, which restricts the generalizability of the findings. Second, many courses at the graduate level may have different course designs and teaching modalities across the different content areas (e.g., theory, statistics, research, clinical, and practicum courses). Typically, practicum courses present a more intensive interaction for supervision and promote connectedness between students and faculty than theory courses (Hatcher, Shields, Wierba, Hatcher-Ross, & Hanley, 2014). Therefore, different types of course content may produce different findings and implications. We felt, however, that it was important to examine the utility of the SCEQ-M across a variety of course types in order to demonstrate the utility of the instrument. Future research could focus on the interaction between engagement style and type of course. Finally, a confirmatory factor analysis based on this data sample should be conducted to determine the robustness of the factor structure. We believe an additional study is needed to cross-validate the factor structure supported in this initial study.

Implications for practice and future research

There are implications for faculty interested in improving student engagement in their classrooms. Instructors can use the SCEQ-M to compare student engagement styles, and these findings could then be used to direct changes to classes that improve student engagement or better match student engagement styles. For instance, students who report lower levels of goal-oriented engagement might benefit from a clearer understanding about how the course will benefit them as they pursue academic or career goals. Future researchers could use the SCEQ-M to collect longitudinal data that may be useful in predicting student engagement, learning performance, and long term-outcomes such as graduation rates, passing certification examinations, or successful employment. Given the rapid growth of distance education and the associated barriers to instructor-student relationships within the online classroom (e.g., asynchronous interaction, lack of body language, or nonverbal cues), research into student-faculty engagement in the context of their courses merits investigation.

In addition, the results from the SCEQ-M also may provide useful feedback directly to instructors regarding their student engagement style by comparing courses they teach in the classroom to those they teach online. For instance, faculty might find that self-disciplined engagement is more important to student learning in online courses where students are more detached and independent from course instructors, while applied engagement is more important for student learning in skills-based courses like practicum or internship. In sum, students might have higher or lower scores across different dimensions of engagement, and knowing that, the instructor could give selective attention to improve areas of lower engagement to improve student learning.

The SCEQ-M may be used as a tool that supplements traditional course evaluation measures and helps improve student satisfaction, adherence to course guidelines, student retention, final grades, and other outcomes for the course. In other words, the better an instructor's understanding of student engagement style, the better the instructional outcome for his or her students. The SCEQ-M has several distinct benefits:

- it offers a shortened version (19 items) that takes less than 15 minutes to complete,
- it has demonstrated reliability both globally and within four dimensions, and
- it is suitable for use in both on-campus and online learning environments.

Future research should include confirmatory factor analysis to cross-validate the factor structure found in this study. Structural equation modelling would also be useful to investigate latent or moderator variables associated with this construct of graduate engagement. Finally, it would be useful to compare and contrast engagement style based on the type of course being taught (e.g., seminar vs. lecture, practice-based/applied vs. knowledge-based/conceptual).

In conclusion, the SCEQ-M enables researchers to measure student engagement for all methods of course delivery. The factor structure, reliability, and validity of the scores on the revised scales were found to be acceptable in the field of education. Accordingly, the SCEQ-M shows promise as a useful assessment and research tool for researchers and educators interested in investigating the nature and strength of graduate student engagement styles in both on-campus and online courses or a hybrid of the two. The SCEQ-M also offers a robust measurement for future researchers to explore the graduate student engagement construct in relation to other variables such as technology behaviors, motivation, academic achievement, and faculty engagement.

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APPENDIX A: STUDENT COURSE ENGAGEMENT QUESTIONNAIRE-MODIFIED

Modified items are in italics

IMPORTANT NOTE: Please indicate which course you are referencing when you are responding to the survey items.

Course Title: _____
Course Number: _____
Instructor: _____
The course taken (select one): Fully On-campus_____, Fully Online_____

To what extent do the following behaviors, thoughts, and feelings describe you, in this course? Please rate each of them on the following scale:

5 = very characteristic of me
4 = characteristic of me
3 = moderately characteristic of me
2 = not really characteristic of me
1 = not at all characteristic of me

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1. _____ Raising my hand *or answering questions in class*
2. _____ Participating actively in small group *or discussion board* discussions
3. _____ Asking questions when I don't understand the instructor
4. _____ Doing all the homework problems
5. _____ Coming to class every day *or logging on to the class webpage regularly*
6. _____ Going to the professor's office hours *or contacting him/her* to review assignments or tests, or to ask questions
7. _____ Thinking about the course between class meetings
8. _____ Finding ways to make the course interesting to me
9. _____ Taking good notes in class
10. _____ Looking over class notes between classes to make sure I understand the material
11. _____ Really desiring to learn the material
12. _____ Being confident that I can learn and do well in the class
13. _____ Putting forth effort
14. _____ Being organized
15. _____ Getting a good grade
16. _____ Doing well on the tests
17. _____ Staying up on the readings
18. _____ Having fun in class
19. _____ Helping fellow students
20. _____ Making sure to study on a regular basis
21. _____ Finding ways to make the course material relevant to my life
22. _____ Applying course material to my life
23. _____ Listening carefully in class *or carefully reading online course discussion posts*

[Adapted from: Handelsman, M. M., Briggs, W. L., Sullivan, N., & Towler, A. (2005). A measure of college student course engagement. Journal of Educational Research, 98(3), 184–191. Retrieved from http://www.jstor.org/stable/27548076]

On-Campus/Online Students Demographics Questionnaire

1. What is your age? _____
2. Indicate your gender: Male ___ Female _____
3. What is your enrollment status? Full-time Student _____ Part-time Student _____
4. What is your major? _____

(Pick your level of program)

- PhD
- Master
- Advance Certificate
- Non-Degree Seeking