Predictors of Instructor Practices and Course Activities that Engage Online Students

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Abstract

Much research on student engagement has recommended a variety of activities and instructor attitudes and behaviors that effectively engage online students such that they are more likely to persist in achieving their educational goals. This study asked online students how often they engaged in research-based effective activities in their courses and how much their instructors engaged them, but used prediction models to find out which activities and instructor attitudes/behaviors predicted the *most* engaging activities and instructor attitudes and behaviors. The purpose of this study was to provide instructors with the most effective strategies in terms of activities designed in their courses along with attitudes/behaviors to emulate that would have the most positive effect for engaging students. Such data would also inform the curriculum for faculty professional development.

Introduction

Research has shown that higher levels of student engagement in online courses encourage student persistence and retention (Boston & Ice, 2011; James, Swan, & Daston, 2016; Konstantinidis & Goria, 2016). Given that students might be at higher risks for feelings of isolation (Croft, Dalton, & Grant, 2011; Rovai & Downey, 2010) along with the continuing concern among academic leaders that retaining online students is a greater problem for online courses than for face-to-face courses (Allen & Seaman, 2016), it is important to ensure that online students are engaged in meaningful course activities and instructors employ strategies that actively engage students.

In an effort to measure level of engagement in Penn State online courses at World Campus, a survey was distributed to online students in the spring and fall of 2016. The present study was conducted on behalf of the World Campus (Online Education) Faculty Development Unit to inform professional development curriculum primarily in courses that emphasize Online Teaching Presence, Effective Online Instruction, and Online Course Design. The purpose was to confirm that best practices our online Faculty Development Unit advocate are ones that promote student engagement from the perspective of our online students. The survey had two major components; one rating the design aspects of a course (primarily course activities) and the other rating instructors' behaviors that encouraged engagement with the instructor, peers, and course content.

The research questions guiding this study were:

Research Question 1: Which course-related activities predict high levels of engagement as perceived by online students?

Research Question 2: Which instructor behaviors predict high levels of engagement as perceived by online students?

Definition of Student Engagement

The definition of student engagement used in this study was adapted from Kuh (2009), who defined engagement in the following way:

"The engagement premise is straightforward and easily understood: the more students study a subject, the more they know about it, and the more students practice and get feedback from faculty and staff members on their writing and collaborative problem solving, the deeper they come to understand what they are learning" (p. 5).

Literature Review

In a 2007 report from the Association of American Colleges and Universities (AAC&U) on college learning for the new global century, "high-impact" practices that engage students are gaining more attention in higher education. These high-impact practices are discussed in a subsequent AAC&U report by Kuh (2008) where he described strong positive effects of participating in high-impact activities as measured by the National Survey of Student Engagement (NSSE). These high-impact activities are fostered in the following programs: first-year seminars, learning communities, service learning, undergraduate research, and capstone experiences. The NSSE survey has also been applied to the online learning environment (Robinson & Hullinger, 2008). From an operational standpoint, the survey measures aspects of student engagement based on the Seven Principles of Good Practice in Undergraduate Education (Chickering & Gamson, 1987). The online survey measures factors such as level of academic challenge, e.g., whether students are putting forth enough academic effort such as time spent studying, reading, writing, and preparing for class, and student-faculty interaction as it relates to the nature and frequency of contact students have with their faculty. NSSE also measures active and collaborative learning, which refers to efforts students expend in discussions and group work with peers. What is notable is the positive outcomes of high-impact practices - with the most common outcome being student persistence followed closely by academic performance usually defined as grade point average (AAC& U, 2007).

While online students may drop courses for many reasons that have nothing to do with feelings of isolation or lack of engagement in course content or with peers and instructors (Park & Choi, 2009; Willging & Johnson, 2009), there is much that can be done to avoid online students' non-persistence due to a feeling of disconnectedness to the learning community and the lack of challenge/motivation/interest in course content. Higher levels of student engagement in online courses positively impact student persistence and retention according to Boston and Ice (2011) and Gray and DiLoreto (2016). This engagement involves not only what instructors *do* that engage students, but also what students *do* in the way of instructional activities.

Furthermore, in a review of the literature on factors influencing online students' decision to drop out, Street (2010) found that overall, internal factors of self-efficacy, self-determination, autonomy, and time management along with external factors of family, organizational and technical support were found to be significant. An interesting finding was that course factors such as course relevance and course design were found to significantly impact learners' decisions to persist or drop. Thus, the present study focused on not only what instructors can do to engage students addressing such internal factors such as self-efficacy, need for autonomy and motivation, but also on how aspects of course design can promote student engagement in an effort to reduce attrition rates. Obviously what instructors do and how they design their courses cannot prevent online students from dropping out when some external barriers are involved.

Concluding the literature review section are several frameworks that support and reinforce student and instructor engagement: Community of Inquiry, Persistence Model of Online Learning Retention, and Indicators of Engaged Learning Online.

Community of Inquiry: Building Online Learning Communities

Establishing a strong sense of belonging in a learning community is at the heart of successful retention and success (Thomas, 2013). According to Ryan and Deci (2000), the need for belonging (relatedness) is prominently featured in their self-determination theory and accounts for students' motivation to persist in achieving academic goals. Research has shown that building a learning community where learners feel connected to the learning space, each other and the instructor result in greater cognitive learning and persistence in online courses (Lee & Choi, 2011; Menchaca & Bekele, 2008; Rovai, 2002; Shea, 2006; Swan, 2002). Morris and Finnegan (2008) found that factors that contributed to persistence and success according to online students were: flexibility in the asynchronous environment, time-on-task, procedural/instructional clarity and faculty involvement and feedback. Among those student completers in the study, faculty presence and participation contributed to their sense of belonging in the course and this differed sharply from students who withdrew.

There are many ways that an instructor can engage learners to make them feel connected to the learning process and keep them on track. Much of the community of inquiry (COI) research suggests what instructors can do to connect and engage students by interacting with them via three kinds of presence: social, cognitive, and teaching (Garrison, Anderson, & Archer, 2001; Garrison, 2007; Pollard, Minor, & Swanson, 2014). Social presence refers to what instructors do to encourage students' feelings of being connected to the instructor and their peers. Teaching presence involves what instructors do to facilitate learning, while cognitive presence involves the design of activities that promote cognitive engagement such as problem-solving, interesting/motivating activities, using varied resources and tools, and exploring content that can be applied to real-world practice. Furthermore, Shea et al. (2014) recently added "learning presence" after conducting research involving quantitative content analysis and social network analysis of online discussions in a doctoral level course. Learning presence filled a gap the researchers felt existed in the framework, which addressed what students bring to their individual and collaborative activities to self-and co-regulate their learning. Ultimately, knowledge construction is regarded as a socio-cognitive process and each of the three presences have a social aspect to the learning that happens in an online course.

Persistence Model for Online Student Retention

The persistence model of retention is a student-centered model where teaching and design strategies revolve around the student at the center of the online learning experience. In Figure 1, important factors such as student self-awareness, self-efficacy, their learning goals and means to achieve them along with rewards that motivate achievement are addressed in order to promote student success and retention.

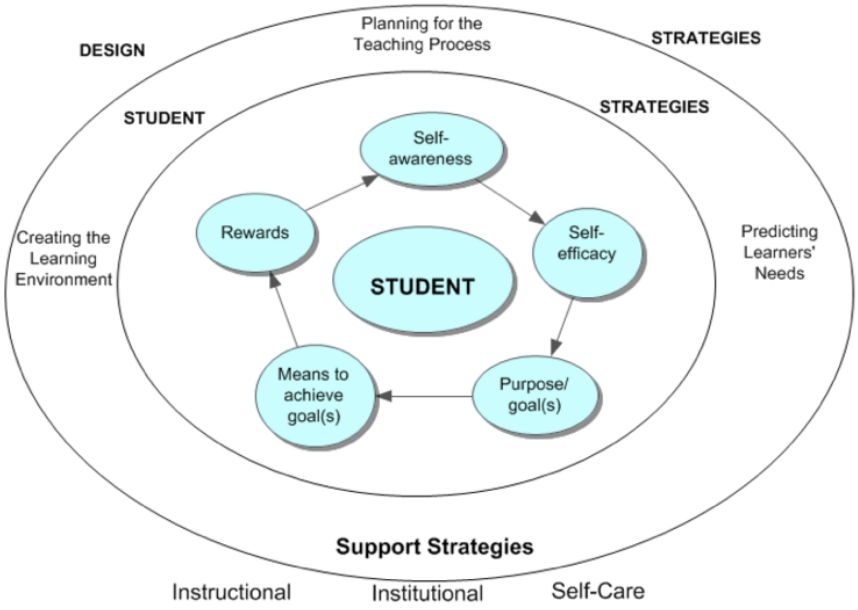

Figure 1: Persistence Model for Online Student Retention

Design and teaching strategies are based on creating a positive learning environment and a knowledge of learners' needs. Design strategies are methods instructors use to incorporate intrinsic and extrinsic motivators (Lehman & Conceição, 2014, p. 88). For example, when instructors are creating a positive learning environment, they may use a variety of content formats and consider relevance and real-world examples to maintain student motivation. Instructors will also use teaching strategies such as setting up clear expectations, personalizing interactions with students, incorporating meaningful feedback to create a sense of presence and thus engaging students during the learning process. Furthermore, instructors will identify students' skill deficiences so as to provide appropriate scaffolding that addresses student needs.

Along with instructor strategies, the student-centered model of retention includes student strategies and the expectation that they become more self-aware so as to build self-efficacy. Instructors can help students identify realistic academic along with the means to achieve them through guidance on developing skills in time-management, self-monitoring, and metacognition. Opportunities for reflection can be incorporated into course assignments and activities. Certainly focusing on learning processes, the learning environment, and student needs change the emphasis from teaching to learning and what is needed for better learning experiences so students stay engaged and motivated.

Indicators of Engaged Learning Online (IELO)

Appendix B illustrates thirty indicators of engaged learning online, which are broken down into three major areas: Instructional Approach, Teaching, and Learning. The IELO framework is a research-based tool that incorporates both instructor roles and design features of an online course that indicate the extent to which a course is engaging to online students. This framework is based on the Indicators of Engaged Learning created by the Council for Educational Research and Development, and the North Central Regional Educational Laboratory (Jones, Valdez, Nowakowski, & Rasmussen, 1995). The Indicators of Engaged Learning (Edel-Malizia & Brautigan, 2014) provide indicators and definitions of teaching and learning approaches and are used to document the use of technology in the classroom related to student engagement. The IELO framework (See Appendix A) was repurposed for online courses. An additional feature represented in the IELO framework is the multidimensional aspects of engagement, which ties each of the thirty indicators to multi-dimensional aspects of a learner. By incorporating multi-dimensional aspects of engagement, the total student experience is considered. Fredricks, Blumenfeld, and Paris (2004) described the

three aspects as socio-emotional, cognitive, and behavioral engagement. Each aspect of engagement is described below:

- Socio-emotional engagement (affective) - involves interactions and reactions, e.g., students have strong ties to the community of learners.
- Cognitive engagement – described as thoughtful and involves mindfulness, e.g., instruction challenges students to draw upon basic skills to engage in higher level thinking and requires students to interact with the curriculum in a deep and thoughtful manner.
- Behavioral engagement – described as having a high level of online class participation and interactions with peers and the instructor that also extends beyond course requirements.

In conclusion, Appendix A lists each survey item and adds the source of the research-based practices and instructor attitudes and behaviors.

Method

Participants

Four hundred and eighty-five World Campus students participated in the survey, including 288 females and 197 males. Three hundred and ninety-one or 80.62% of the respondents were in the age range of 24-49, with the largest group of participants in the 30-39 age range (38.35%). Most participants were in a Bachelor of Arts and Bachelor of Science degree programs (63.92%) and 34.85% of the students were in either an Associate of Arts or Associate of Science degree programs. 68.90% of the students were employed full-time.

In all, 5096 surveys were sent electronically. The sample used was a convenience sample. The response rate for the survey was 9.6%.

The Student Engagement Survey Instrument

The Student Engagement Survey comprised a total of 27 questions in two sub-scales:

- Student Engagement Activities (14)
- Instructor Attitudes and Behaviors (13)

Reliability of the survey was good for the survey and subscales (Table 1).

Table 1

Reliability Statistics on Student Engagement Survey and Subscales

Scales	Cronbach Alpha	N of Items
Student Engagement	0.95	27
Student Engagement Activities	0.90	14
Instructor Attitudes and Behaviors	0.96	13

The survey items were informed by Chickering and Erhmann's (1996) seven principles of good practice in undergraduate education applied to the online learning environment using a modified version of the NSSE survey (Robinson & Hullinger, 2008), the Community of Inquiry (Shea et al., 2014), the Online Engaged Learning Framework (Edel-Malizia & Brautigam, 2014), high impact practices in higher education (NSSE, 2015), and the persistence model (Conceição & Lehman, 2014). See Appendix A.

Procedures

Students enrolled in the spring and summer semester of 2016 were sent the survey in an electronic format using Qualtrics survey software. Students in both semesters were sent the survey *after* they completed their courses in each respective semester. In July, the spring semester students were surveyed, while the summer semester students were sent surveys in the latter part of August after they completed their courses.

In the survey instructions, students were asked to think of a course they took and answer the quantitative questions with that course in mind, then they were asked to respond to two qualitative open-ended questions (See Appendix A):

1. Define what it means to you to be engaged in a course.
2. Does this course meet your definition of "engaged" learning? Yes/No. Why or why not?

The email recruitment letter specified what the survey was about and the expectations of the study:

Penn State World Campus is conducting a study on student engagement and its effect on your online learning experience. We are asking for your participation in this study because we value your opinion about how much you were engaged in the learning process in a World Campus course that you select to rate. With a specific course in mind, please evaluate that course as honestly as you can. The survey will take about 10 minutes of your time. The survey asks questions about how much your instructor interacted with you in the course and encouraged your active participation. The survey also asks questions about how much you interacted with the course content and your peers and to what extent the design of the course activities engaged you.

The information you provide will be used to improve faculty development efforts to better prepare faculty for facilitating student learning along with instructional designers who work with faculty to design more engaging activities.

The student responses were kept anonymous and no identifiable data could be traced back to their user identification numbers.

Results

A total of 344 students responded to the questions in both engagement subscales. Table 2 shows the means for the first subscale on "Student Engagement Activities" separated by students who answered 'Yes' that their course was engaging and students who answered 'No' their course was not engaging. Students were asked: "During the course, how often have you engaged in the following activities?" The rating scale was: (1) Never/rarely, (2) Sometimes, (3) Usually, (4) Very often.

Table 2
Student Engagement Activities Means (Yes vs. No)

Survey Items for Student Engagement Activities	Mean (Yes)	Mean (No)
1. Participated in online discussions	3.17	2.50
2. Shared your knowledge and expertise with the learning community	2.67	1.97
3. Interacted with other students in team tasks or projects	2.66	2.09
4. Participated in hands-on practice so that you can apply learned knowledge to the real-world	2.83	2.14
5. Assessed peers on team-based assignments	2.13	1.75
6. Assessed peers on individual assignments	2.00	1.60
7. Used various computer technologies to communicate with the instructor and class peers	3.35	2.49
8. Used library resources to complete assignments	2.41	1.96
9. Made a presentation to the class	1.80	1.59
10. Participated in setting goals and choosing tasks to meet course requirements	2.69	2.03
11. Learned through meaningful and challenging activities	3.54	2.23
12. Took advantage of opportunities to explore new ideas/tools and push the envelope in ideas and/or research	2.99	1.83
13. Worked on assignments or activities that involved using research skills	3.15	2.43
14. Had an opportunity to teach your peers	2.01	1.60

Table 3 shows the means for the second subscale on "Instructor Attitudes and Behaviors" separated by students who answered 'Yes' that their course was engaging and students who answered 'No' their course was not engaging. Students were asked: How much has your instructor done the following?" The rating scale was: Not at all or very little (1), Some (2), Quite a bit (3), and Very much (4).

Table 3
Instructor Attitudes and Behaviors Means (Yes/No)

Survey Items for Instructor Attitudes and Behaviors	Mean (Yes)	Mean (No)
1. Shown respect in all communications with them	3.85	2.86
2. Shown enthusiasm when interacting with students in the learning environment	3.72	2.47
3. Clearly explained course goals and expectations	3.70	2.40
4. Used examples or illustrations that helped you understand course content better	3.64	2.21
5. Participated in discussions with students around ideas from the readings or class notes	3.29	1.72
6. Related course content to work experiences or real-world experiences	3.28	1.93
7. Provided prompt (within 72 hours) and meaningful feedback on activities, assignments or projects	3.64	2.41
8. Communicated with you about your course progress (i.e., grades, quality of work, ways to improve, etc.)	3.44	1.91
9. Motivated you to get interested in the course content	3.41	1.57
10. Prompted me to reflect on my learning and think more deeply about the course content	3.44	1.68
11. Assessed my learning in a variety of ways	3.37	1.60
12. Created a supportive and safe learning environment that allows for diversity and multiple perspectives	3.67	2.17
13. Taught self-regulating strategies (e.g., how to self-monitor progress or manage time, how to seek help, how to learn on your own)	3.18	1.76

Overall, most students (N = 246, 72%) found their courses engaging and answered "yes" to the question, "Does this course meet your definition of "engaged" learning? Twenty-eight percent answered "no" (N=98, 28%).

Using both subscales on" Student Engagement Activities" and "Instructor Attitudes and Behaviors", a Chi-Square statistical test demonstrated those activities and instructor behaviors that predicted whether or not students found their courses engaging or not. The dependent variable i.e., categorical variable was Yes or No. Results in Table 4 were statistically significant for the following student activities and instructor attitudes and behaviors and were the best predictors of students determining that a course was engaging.

Table 4
Predictive Activities and Instructor Attitudes and Behaviors for an Engaged Course

Predictive Items for Student Activities and Instructor Attitudes and Behaviors	**DF**	**Estimate**	**Standard Error**	**Wald Chi-Square**	**PR > ChiSq**
Shared your knowledge and expertise with the learning community.	1	0.06746	0.2623	6.6147	0.0101
Used various computer technologies to communicate with the instructor and class peers.	1	0.5029	0.2509	4.0172	0.0450
Made a presentation to the class.	1	-0.6431	0.2478	6.7343	0.0095
Learned through meaningful and challenging activities.	1	1.3714	0.2995	20.9624	<.0001
Worked on assignments or activities that involved using research skills	1	-0.6749	0.2704	6.2282	0.0126
Provided prompt (within 72 hours) and meaningful feedback on activities, assignments or projects.	1	0.7476	0.2484	9.0544	0.0026
Prompted me to reflect on my learning and think more deeply about the course content.	1	0.6775	0.2660	6.4882	0.0109
Assessed my learning in a variety of ways.	1	0.9323	0.2838	10.7905	0.0010

Table 5 shows the instructor attitudes and behaviors that best predict student engagement based on the total engagement score as the dependent variable. A multiple linear regression was used with the significant values expressed in t-test results below.

Table 5
Predictive Relationship between Student Engagement Score and Instructor Attitudes and Behaviors

Predictive Items for Instructor Attitudes and Behaviors	DF	Parameter Estimate	Standard Error	T Value	PR>|t|
Shown respect to students in all communications with them	1	-2.18395	0.71582	-3.05	0.0025
Participated in discussions with students around ideas for the readings or class notes	1	1.94998	0.57157	3.41	0.0007
Related course content to work experiences or real-world experiences.	1	1.20068	0.58310	2.06	0.0402
Prompted me to reflect on my learning and think more deeply about the course.	1	2.19094	0.64296	3.41	0.0007
Created a supportive and safe learning environment that allows for diversity and multiple perspectives.	1	2.16453	0.67672	3.20	0.0015

Discussion

Engaging Activities

Many of the survey items for engaging activities were research-based that had the potential to result in a greater likelihood of students being motivated to persist in their academic programs (Meyer, 2014; NSSE, 2015). Appendix A shows how each survey item is linked to research studies on various aspects of student engagement such as building community, high impact practices, student persistence, and indicators of engaged learning online (Gray & DiLoreto, 2016; Lee & Choi, 2011; Shea, 2006). Therefore, training instructors in designing activities that promote engagement is a valid goal for any faculty development program.

The survey items used in this study asked students how *often* they engaged in these activities assuming that students regarded these activities as engaging. The mean scores reported for each activity in Table 2 demonstrated that students who answered yes that their course was engaging, engaged more often in each of those activities than those who reported no. The same observation was made for students who answered yes and reported that their instructors exhibited attitudes and behaviors that engaged them in the course much more so than students who reported no (See Table 3).

Students could have often engaged in the activities but that did not mean that students necessarily felt those activities were engaging. Therefore, we used a statistical model (chi square) to predict which activities were better predictors of engagement based on the scores that students gave based on whether or not they found their course engaging (Yes/No categorical variables). The first research question in this study asked which activities predicted high engagement. Results in Table 4 showed the following activities most engaging:

- **Shared your knowledge and expertise with the learning community**.
- **Used various computer technologies to communicate with the instructor and class peers**.
- Made a presentation to the class.
- **Learned through meaningful and challenging activities**.
- Worked on assignments or activities that involved research skills.

The three activities that predicted high engagement (in bold) were not surprising because they are activities that are supported by research (See Appendix A) and adult learner research, e.g., sharing knowledge and expertise and learning through meaningful and challenging activities (Knowles, Holton, & Swanson, 2011). Moreover, qualitative data in this study supported all three activities. See some of the quotes from students who explained why their course was engaging:

"The assignments were challenging and required students to perform research in order to complete the assignments. Group work was broken into smaller groups so we could have more meaningful discussions with our group mates."

"It was a very interesting course where I was able to use my current and prior experiences and apply them to the course and assignments. It made me think about where I have been and where I am going and how I use what I learned."

"The professor used multiple technologies, teaching methods and activities to help us learn, evaluate discuss and share the subject we were studying."

"I thoroughly enjoyed simulations of experiments and links to further learning. Also loved relevant articles and pointers to current events on topical issues."

"The professor used multiple methods of media to help keep students engaged and interested in the learning process. The instructor gave very specific, individual feedback on each assignment. This was very helpful!"

Two of the activities (made a presentation to the class, and worked on assignments or activities that involved research skills) negatively predicted engagement. This result did not surprise us because making presentations are often done as culminating activities in group projects. Many students do not like group work because of issues with social loafing and scheduling problems. Since adult learners are not always in the same time zone and some may be in distant countries, coordinating schedules is a time-consuming task that presents barriers (Chang & Kang, 2016; Taylor, 2011).

With respect to working on assignments or activities involving research skills, we were not surprised that this activity negatively predicted engagement because many instructors and students may not be aware of the many online library resources World Campus has to offer online students. Students need more preparation for using library resources while researching topics. There could also be a negative effect because using research skills are typically part of group projects, which many students already feel negatively predisposed because of the issues discussed above.

Activities and Instructor Attitudes and Behaviors Predictors

The means for each instructor attitude and behavior in Table 3 demonstrated that students who said yes, their course was engaging, had instructors that exhibited the thirteen attitudes and behaviors quite a bit or very much (3.18 – 3.85 out of 4 on the rating scale). Although instructors could have often demonstrated these attitudes and behaviors; again, that did not mean that students felt high instances of these attitudes and behaviors made a course more engaging. The second research question in this study asked which instructor attitudes and behaviors predicted high engagement.

The three instructor behaviors that predicted high engagement were:

- Provided prompt (within 72 hours) and meaningful feedback on activities, assignments, and projects.
- Prompted me to reflect on my learning and think more deeply about the course content.
- Assessed my learning in a variety of ways.

None of these behaviors were surprising because much research supports instructors' providing good feedback and a variety of assessment methods (Ambrose et al., 2010; Barkley & Major, 2016; Bigatel & Williams, 2015).

When we looked at the instructor attitudes and behaviors based on a total engagement score (Table 4), the following attitudes and behaviors ranked high in engagement:

- Participated in discussions with students around ideas from the readings or class notes
- Related course content to work experiences or real-world experiences
- Prompted you to reflect on your learning and think more deeply about the course content
- Created a supportive and safe learning environment that allows for diversity and multiple perspectives

Appendix A shows where research supports how these instructor attitudes and behaviors have positive impacts on student engagement.

According to Table 5 in the results section, the instructor attitude, "shown respect to students in all communications with them", negatively predicted engagement. This may not be such a surprising result given that other engaging attitudes and behaviors were clearly more important to students. Perhaps with a larger sample taken from various institutions, we may see a different perception from

adult students who believe showing respect is very important in terms of keeping them engaged in the learning process.

Limitations and Future Research

The sample used in this study had a low response rate of 9.6% and was a convenience sample from one institution. Therefore, results cannot be generalized to other populations. Furthermore, although the survey instrument showed good reliability in this study and one other study (Bigatel & Williams, 2015), validation of the instrument was not done.

Additionally, the survey instrument required participants to self-report their perceptions, the results can only be considered valid to the extent that subjects truthfully reported their own perceptions. Often the participants who volunteer to complete a survey have either very good or very bad experiences, so results are skewed in either direction. In future research, it would be interesting to have students report the grade they received in the course on which they reported their experiences. There may be an influence effect such that the grade received (good or bad) influenced how students responded because the survey was distributed after students had completed their courses at a time when they would have already known their grades. In the future, perhaps timing the survey towards the end of a course will mitigate that variable.

The next step will be a validation study of the survey instrument, then re-administering a validated instrument more widely in conjunction with another partner university. Lastly, our research team intends to conduct further analyses of our data to see if there are differences in predictors of engaging activities and instructor attitudes and behaviors among students who reported by discipline, age group, class standing, and gender.

Conclusion

The intent of our study was to provide some validity to our professional development efforts to train instructors in the most effective teaching behaviors/attitudes and instructional activities that engage online students. Of particular interest to the faculty development unit was the prioritization of activities and instructor attitudes and behaviors that would engage our online students. Core faculty development courses could emphasize high predictor strategies that students felt were most effective in keeping them engaged in a course. Of interest was the indication that instructor attitudes and behaviors seemed to have more influence than course activities vis a vis keeping students engaged. Tables 3 shows a bigger difference in means from students who said yes, their course was engaging vs. students who said no. Qualitative data supported this perception because students more often explained they were either engaged or not engaged in terms of what the instructor did. A closer exploration of the qualitative data should reveal some nuances in students' responses to the qualitative question that asked them why their courses were engaging or not engaging. Nonetheless, our sample was limited, but it would be interesting to see if there are differences in predictors of high engagement by discipline because instructors in different disciplines may find such fine tuning helpful for their respective student populations.

Finally, future research could add some interesting insights if instructors were surveyed about what they perceived as engaging activities and instructor attitudes and behaviors. A comparison of what instructors thought were effective strategies and what students thought were effective might yield some startling differences.

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Appendix A

Student Engagement Activities: During the course, how often have you engaged in the following: 14 statements ranked from very often (4) to never/rarely (1)	**Source in Research Literature**
Participated in online discussions	Bigatel and Williams (2015),COI, IELO, NSSE, Persistence Model
Shared your knowledge and expertise with the learning community	Bigatel and Williams (2015), COI, IELO
Interacted with other students in team tasks or projects	Bigatel and Williams (2015), COI, IELO, NSSE
Participated in hands-on practice so that you can apply learned knowledge to the real-world	Bigatel and Williams (2015), COI, IELO, NSSE
Assessed peers on team-based assignments	Bigatel and Williams (2015), Persistence Model
Assessed peers on individual assignments	Bigatel and Williams (2015); Persistence Model
Used various computer technologies to communicate with the instructor and class peers	Bigatel and Williams (2015), IELO, Ragan et al (2012)
Used library resources and other digital resources or tools to complete assignments	Bigatel and Williams (2015), COI, IELO, NSSE, Persistence Model
Made a presentation to the class	Bigatel and Williams (2015), NSSE
Participated in setting goals and choosing tasks to meet course requirements	IELO
Learned through meaningful and challenging activities	COI, IELO
Took advantage of opportunities to explore new ideas/tools and push the envelope in ideas and/or research	COI, IELO, NSSE
Worked on assignments or activities that involve using research skills	COI, NSSE
Had opportunities to teach your peers	IELO, NSSE
Instructor Attitudes and Behaviors: How much has your instructor done the following?: 13 statements ranked from very much (4) to not at all or very little (1)	
Shown respect to students in all communications with them	Bigatel and Williams (2015); Ragan et al (2012)
Shown enthusiasm when interacting with students in the learning environment	Bigatel and Williams (2015); Ragan et al (2012)
Clearly explained course goals and expectations	Bigatel and Williams (2015), COI, NSSE, Persistence Model, Ragan et al (2012)
Used examples or illustrations that help you understand course content better	Bigatel and Williams (2015), NSSE, Ragan et al (2012)
Participated in discussions with students around ideas from the readings or class notes	Bigatel and Williams (2015), COI, IELO, NSSE
Related course content to work experiences or real-world experiences	Bigatel and Williams (2015), COI, IELO, NSSE
Provided prompt (within 72 hours) and meaningful feedback on activities, assignments. or projects	Bigatel and Williams (2015), COI, NSSE, Persistence Model, Ragan et al (2012)
Communicated with you about your course progress (i.e., grades, quality of work, ways to improve)	Bigatel and Williams (2015, COI, NSSE, Persistence Model, Ragan et al (2012)
Motivated you to get interested in the course content	Bigatel and Williams (2015, COI, NSSE, Persistence Model, Ragan et al (2012)
Prompted you to reflect on your learning and think more deeply about the course content	COI, IELO, NSSE
Assessed your learning in a variety of ways	IELO, Ragan et al (2012
Created a supportive and safe learning environment that allows for diversity and multiple perspectives	COI, NSSE, IELO, Persistence Model, Ragan et al (2012)
Taught self-regulating strategies (e.g., self-monitoring progress, time	

management, help seeking skills, self-instruction) IELO

Open-ended questions

Define what it means to you to be engaged in a course.

Does this course meet your definition of engaged learning? Please explain why or why not.

Demographic Variables

age range: 18-24, 25-34, 35-45, 46-55, over 55

How many hours per week do you usually spend on this course?

What is your classification? (1st year student, sophomore, junior, senior, non-degree, graduate, other)

What is your academic major?

Are you currently employed? If so, how many hours per week?

Appendix B

COGNITIVE INVESTMENT (Thoughtful)

SOCIO-EMOTIONAL ENGAGEMENT (Interactions/reactions)

BEHAVIORAL ENGAGEMENT (Participation)

Indicators of Engaged Learning Online

INSTRUCTIONAL APPROACH			
Vision of Learning		Responsible for learning	Learner involved in setting goals, choosing tasks, developing assessments and standards for the tasks; has big picture of learning and next steps in mind
		Strategic	Learner actively develops repertoire of thinking/learning strategies for changeable and complex knowledge building
		Energized by learning	Learning is intrinsic; has a passion for learning, solving problems
		Collaborative	Learner develops new ideas and understanding in conversations and work with others
Technology		Interconnectivity	Technology allows interaction by communicating and collaborating in diverse ways
		Access to challenging tasks	Technology offers or allows access to tasks, data, and learning opportunities that stimulate thought and inquiry
		Enables learning by doing	Technology offers access to simulations, goals-based learning, and real-world problems and productivity tools
		Media Use	Technology provides opportunities to use and create digital media
TEACHING			
Instructor Role		Facilitator	Engages in negotiation, stimulates and monitors discussion and project work but does not control
		Guide	Helps students construct their own meaning by modeling, mediating, explaining when needed, redirecting focus, providing options
		Co-learner/co-investigator	Instructor considers self as learner; willing to take risks to explore areas outside his or her expertise; collaborates with other experts and practicing professionals
Tasks		Authentic	Pertains to real world, meaningful intellectual work; may be addressed to personal interest
		Challenging	Difficult enough to be interesting but not totally frustrating, usually sustained
		Multidisciplinary	Involves integrating disciplines to solve problems and address issues in context
Grouping		Heterogeneous	Small groups with persons with different skill sets, backgrounds, interests
		Equitable	Groups sized and organized so that over time all students have challenging learning tasks/experiences
		Flexible/agile	Different groups organized for different instructional purposes; supports collaboration across multiple contributors
Instructional Model		Interactive	Instruction actively engages learners through meaningful context and construction of knowledge; encourages, supports and responds to student contributions, needs, requests for clarification, etc.
		Generative	Instruction oriented to constructing meaning; providing meaningful activities/experiences

COGNITIVE INVESTMENT (Thoughtful)

SOCIO-EMOTIONAL ENGAGEMENT (Interactions/reactions)

BEHAVIORAL ENGAGEMENT (Participation)

Indicators of Engaged Learning Online

LEARNING		
Assessment	Performance-based	Involving a performance or demonstration, usually for a 'real' audience and addressing a useful purpose
	Generative	Assessments having meaning for learner; may produce information, product, service
	Seamless and ongoing	Assessment is transparent and integral; students learn during/through challenging and meaningful activities
	Equitable	Assessment is culturally fair
Learning Context	Collaborative	Instruction conceptualizes students as part of learning community; students formally collaborate on important learning tasks
	Knowledge-building	Learning experiences set up to bring multiple perspectives to solve problems such that each perspective contributes to shared understanding for all; goes beyond brainstorming
	Empathetic	Learning environment and experiences set up for valuing diversity, multiple perspectives, strengths
Student Role	Explorer	Students have opportunities to explore new ideas/tools; push the envelope in ideas and research
	Cognitive Apprentice	Learning is situated in relationship with mentor who coaches students to develop ideas and skills that simulate the role of practicing professionals (i.e., engage in real research) professionals
	Teacher	Students encouraged to teach others in formal and informal contexts
	Producer	Students develop products of real use to themselves and others; demonstrated learning

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