IJEDE International Journal of E-Learning & Distance Education
La Revue internationale de l'apprentissage en ligne et de l'enseignement à distance

ISSN: 2292-8588 Volume 41, No. 2, 2026

Online Classes and Student Engagement: Lowering Social Distance Barriers to Improve Self-Efficacy and Motivation to Learn

Karla Borja, Christopher Roby, and Shaista Nisar

Abstract: Students enrolled in asynchronous online college courses often report satisfaction with the flexibility and self-paced nature of their learning. However, many online learners also express concerns about limited opportunities to interact with peers and faculty, which can reduce their confidence in understanding the material and diminish their motivation to learn. In response to these challenges, a group of faculty members in a U.S. university designed and implemented a set of activities aimed at enhancing student engagement with the course content and their peers. The same faculty also taught identical courses without these engagement activities, creating a comparative control group. Students in both groups completed a validated self-efficacy survey to assess their learning experiences. Our results revealed significant differences between groups. Students who participated in the engagement activities showed improved understanding of the material, higher motivation, and greater academic effort than those in the control group.



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https://doi.org/10.55667/10.55667/ijede.2026.v41.i2.1423

Keywords: online learning, engagement activities, self-efficacy, Ologit model

Cours en ligne et engagement étudiant : réduire les barrières liées à la distance sociale pour renforcer le sentiment d'efficacité personnelle et la motivation à apprendre

Résumé°: Les étudiants inscrits à des cours universitaires en ligne asynchrones se déclarent souvent satisfaits de la flexibilité de ce mode de formation et de la possibilité d'apprendre à leur propre rythme. Cependant, nombreux sont ceux qui expriment également des préoccupations quant aux possibilités limitées d'interagir avec leurs pairs et les enseignants. Cette situation peut réduire leur confiance dans leur capacité à comprendre la matière et diminuer leur motivation à apprendre. Pour répondre à ces difficultés, un groupe de membres du corps professoral d'une université américaine a conçu et mis en œuvre un ensemble d'activités visant à renforcer l'engagement des étudiants à l'égard du contenu du cours et de leurs pairs. Ces mêmes enseignants ont également donné des cours identiques, mais sans ces activités d'engagement, permettant ainsi la constitution d'un groupe témoin à des fins de comparaison. Les étudiants des deux groupes ont répondu à un questionnaire validé mesurant leur sentiment d'efficacité personnelle afin d'évaluer leur expérience d'apprentissage. Les résultats de notre étude révèlent des différences significatives entre les deux groupes. Les étudiants ayant participé aux activités d'engagement ont montré une meilleure compréhension de la matière, une motivation plus élevée et un investissement plus important dans leur travail universitaire que ceux du groupe témoin.

Mots-clés°: apprentissage en ligne, activités d'engagement, sentiment d'efficacité personnelle, modèle logit (Ologit).

Introduction

Distance education, or the formal method of instruction where learners and instructors are separated and interactive technologies connect them (Simonson et al., 2019), has gained significant relevance in the U.S., particularly following the COVID-19 pandemic and the increasing availability of technological tools. Between 2012 and 2022, for instance, the percentage of students completing at least one online course more than doubled from 26% to 54% (National Center for Education Statistics, 2023). This trend is not surprising, as many students are drawn to distance education for its flexibility to accommodate diverse needs. Moreover, learners are empowered when they can access educational materials at their own pace, without it affecting other personal or professional goals (Kubikova et al., 2024). However, research on distance education has highlighted several disadvantages associated with this mode of education, including a lack of interest in the subject, reduced effort, and limited interaction and feedback from peers and instructors (Garris & Fleck, 2022). In their study of online learning experiences Racat and Lichy (2022) found that many students reported negative emotions such as anxiety and frustration with course material and limited support, which in turn diminished their motivation to learn. These findings conflict with Bandura's (1986) social cognitive and self-efficacy theory, which emphasized the importance of interaction with peers and instructors in processing information and enhancing self-efficacy.

In a review of the literature on online course design, Holland (2019) found that opportunities for interaction and information sharing enhance knowledge

development and student empowerment. Similarly, Baber (2022) examined online courses during the COVID-19 pandemic and identified a positive relationship between virtual social interaction, learning outcomes, and student satisfaction. In line with this literature, educators have introduced activities that could reduce social isolation in online learning settings. For example, Brainard et al. (2024) designed a voluntary, non-graded group activity to review course material in a relaxed and engaging way, thereby fostering greater interaction among students. Nonetheless, research on the design and effectiveness of well-structured class activities that reduce social distance and enhance the learning environment remains limited.

In this study, we focus specifically on asynchronous online courses (internet-based courses), a form of distance education in which course content is primarily delivered through an online learning platform. The courses are semester-based sections of about 25 students with the same instructors. We seek to address the research gap by presenting an innovative set of activities that promote meaningful social interaction between students, their peers, and the instructor. These activities included video presentations, sharing personal stories and photos, and collaborative teamwork. The primary goal of the activities was to reduce social isolation in virtual learning environments.

The present study contributes to the higher education literature by providing quantitative analysis using experimental and control group design with a large sample size. The findings offer measurable evidence of the effectiveness of these activities in improving students' self-efficacy and learning motivation.

This paper is organized into five sections. The first section reviews literature on student engagement in online learning, and the second section presents the theoretical and empirical framework for the effects of social distancing on learning. The third section describes the engagement activities and the experimental design, while the fourth section reports the results obtained through various quantitative analyses. By comparing an experimental and control group, the findings indicate that students who participated in the engagement activities experienced a more positive learning environment. They also demonstrated greater effort and motivation to learn. The final section offers concluding remarks and key recommendations for educators.

Literature Review on Student Engagement in Online Learning

Online learning offers several advantages, notably flexibility in time, location, and pace. Yet, student engagement, defined as the time and effort learners intentionally dedicate to understanding content (Kuh, 2003), remains limited in asynchronous online settings. For instance, Racat and Lichy (2022) interviewed faculty and students about their experiences with online courses and found that students were anxious and frustrated with the course material and the limited feedback they received, which lowered their motivation to learn. Similarly, Garris and Fleck (2022) reported lower enjoyment and interest in the subject, reduced effort, and limited interaction in online courses.

Engagement Theories

The literature offers various frameworks for conceptualizing engagement. Fredricks et al. (2004) proposed a multidimensional framework which distinguished between behavioral, cognitive, and emotional engagement. Behavioral engagement was determined by students' actions in their effort to learn. Cognitive engagement reflects students' psychological investment in learning, including their willingness to think deeply, apply learning strategies, and persist in understanding complex concepts. Emotional engagement referred to positive attitudes and emotional connection developed in the learning environment. This multidimensional perspective provides a useful foundation for the present study because the engagement activities were designed to address multiple aspects of students' learning experiences. Specifically, the effort index, described in the following section, reflects behavioral investment, while the self-efficacy and motivation indices capture cognitive and motivational aspects of engagement. The inclusivity index reflects students' perceptions of having multiple opportunities to demonstrate their learning and relates to the social and emotional dimensions of engagement. Guided by Fredricks et al.'s (2004) framework, the activities were designed to reduce social distance and strengthen students' self-efficacy, motivation to learn, and sense of inclusion.

In the social cognitive and self-efficacy theory (Bandura 1977, 1986), learning was as a social and cognitive process in which learners actively construct knowledge through observation, reflection, and interaction. Hence, in

an online course, interactive activities with instructors and peers may strengthen students' beliefs about themselves in mastering tasks.

In addition, self-determination theory (Deci & Ryan, 1985; Ryan & Deci, 2000) proposed that intrinsic motivation is fostered when individuals' basic psychological needs for autonomy, competence, and relatedness are adequately supported. Specifically, relatedness referred to the need to feel connected to, valued by, and supported by others. In an asynchronous course, well-designed engagement activities may help fulfill these psychological needs by providing students with choices and opportunities to develop their abilities through meaningful interaction with their instructors and peers.

Similarly, Astin's (1984) theory of student involvement proposed that student learning is influenced by the physical and psychological energy students devote to their academic experiences. From this perspective, the engagement activities examined in this study are interactive and graded, requiring students to actively participate and invest effort in the learning process. Furthermore, Baumeister and Leary (1995) proposed that the need to belong is a fundamental human need, suggesting that activities that connect students may strengthen their sense of inclusion and belonging (Garrison et al., 2000; Moore, 1989, 1993). The interactive activities developed in this study align with strengthening social presence through meaningful interaction and engagement. Empirical research also supports the value of interaction in the classroom, with studies such as Bernard et al. (2009) and Martin and Bolliger (2018) that linked collaboration with improved student outcomes.

Together, these theories suggest that engagement is shaped by interconnected emotional, cognitive, and social processes that can strengthen students' self-belief and intrinsic motivation to learn. Consistent with this perspective, the activities examined in this study were designed to provide ongoing opportunities for students to interact with peers, instructors, and course content.

Engagement Activities in Online Courses and the Research Gap

Recognizing the benefits of engagement activities, particularly in online courses, instructors have implemented both activities that are related, and activities that are not related, to the content to foster student participation and enhance learning. For instance, gamification, has been employed to create more engaging and interactive lessons (Cheung & Ng, 2021). Brainard et al. (2024) used group activity to increase student-to-student interaction during remote learning. Borja and Dieringer (2023) used storytelling that integrated multimedia such as videos, photos, infographics, and animations to help students understand complex economic data. Also, discussion posts have been used to facilitate meaningful peer and instructor interactions (Le, 2022).

However, prior studies have primarily examined discussion boards, gamification, and other engagement strategies as individual interventions, with less attention to the combined use of short, structured activities designed to increase social interaction and reduce perceived distance between students and instructors in asynchronous online courses. In addition, studies have examined student satisfaction, participation, and perceived learning with limited

quantitative evidence. The present study addresses this gap and adds to the literature by examining eight intentionally designed engagement activities as a coordinated intervention rather than as isolated instructional techniques. These activities were integrated into the graded course components, providing structured opportunities for interaction with peers, the instructor, and course content. Using an experimental–control group design, this study compares students who participated in the activities with those enrolled in the same courses without these activities to examine differences in self-efficacy, motivation to learn, sense of inclusion, and academic effort.

Self-Efficacy and Engagement Activities in Online Courses

Self-efficacy refers to an individual's belief in their ability to perform tasks and achieve desired outcomes, and these beliefs are influenced by social factors (Bandura, 1986, 1997). In online learning, where traditional face-to-face support structures are absent, social engagement or the connection with peers and instructors, emerges as a critical enabler of self-efficacy (Zhao & Cao, 2023). Social engagement creates a sense of community and shapes students' academic motivation, modeling the value of hard work (Woreta et al., 2025). In addition, social engagement provides a powerful context for learning through feedback and encouragement (Gebauer et al., 2020). Sun and Rueda (2012) found that particularly in online learning, computer self-efficacy, situational interest and self-regulation were predictors of student engagement. Supported by the studies above, we propose the following hypothesis:

H1: Students in online courses participating in our eight engagement activities report higher levels of self-confidence in their learning process than students who do not participate in the eight engagement activities.

Effort and Engagement Activities in Online Courses

Student effort involves time-on-task and persistence. Astin's (1984) theory of involvement indicated that students who invest more energy in academic and social aspects of college learn more. In line with this theory, Tinto (1997) and Kuh (2009) reported that engagement activities not directly tied to course content helped foster a sense of community and thereby increased students' psychological investment in their studies. This view was supported by Martin and Bolliger (2018), who found that online students engaging in instructor-led and peer-led interactions reported higher levels of effort. Similarly, Dixson (2015) observed that students who perceived their courses as highly engaging, both academically and socially, demonstrated greater effort and participation. Given the evidence described above, our study proposes the following hypothesis:

H2: Students in online courses participating in the eight engagement activities report higher effort in their learning process than students who do not participate in the eight engagement activities.

Motivation and Engagement Activities in Online Courses

Student motivation is shaped by how well the environment satisfies the needs for autonomy and relatedness (Deci & Ryan, 1985; Ryan & Deci, 2000). Lee et al. (2025) examined the relationships between daily autonomy,

relatedness, and classroom engagement among high school students in science courses. Over six weeks, students completed brief surveys after each science class assessing their daily perceptions of enjoyment for the topic of the day, and how connected they felt to their science teacher. The authors found that daily autonomy and relatedness were associated with students' engagement.

In an online learning environment, effective learning arises from intentionally designed activities that promote relatedness through meaningful social engagement (Garrison & Arbaugh, 2007). Consequently, engagement activities must be viewed as the driving force behind motivation and sustained participation, rather than as supplementary features (Vermeulen & Volman, 2024). Based on these insights, we test the following hypothesis:

> *H3: Students in online courses participating in the eight engagement activities report higher motivation to learn the material than students who do not participate in the eight engagement activities.*

Inclusiveness and Engagement Activities in Online Courses

Online learning requires varied opportunities for communication, interaction, and active participation to support students' inclusion. Gayton and McEwen (2007) found that thought-provoking questions and dynamic interaction were among the most valued instructional processes, acknowledging the importance of diversity in online learning. Similarly, Graham et al. (2001) emphasized that incorporating multiple learning activities can promote engagement and inclusiveness. More recently, Deep et al. (2025) found that

engagement activities fostered a stronger sense of community and encouraged students to participate actively.

DiGiacomo et al. (2023), used data from 4,544 undergraduate students in the U.S. and found that opportunities for discussion and interaction with peers were among the environmental features that supported students' sense of belonging in online learning environments. Their findings suggest that belonging is influenced not only by the delivery of course content but also by opportunities for students to connect with others. Also, Kelly and Clinton-Lisell (2025) examined the use of social annotation in asynchronous online courses and found that students who participated in the collaborative social annotation condition reported higher levels of course-level belonging than students who completed the activity individually. More recently, Finkelstein and Soffer-Vital (2025) examined how artificial intelligence could support inclusive formative assessment in higher education. Supported by these studies, we propose the following hypothesis:

> *H4: Students in online courses participating in the eight engagement activities express a greater satisfaction with the different ways in which they can demonstrate their understanding of the material than students who do not participate in the eight engagement activities.*

Table 1 summarizes the four hypotheses described above. Each hypothesis has been linked to an index title.

***Table 1**: Indexes and the Corresponding Hypotheses*

Indexes	Hypotheses
1. Self-Efficacy Index	H1: Students in online courses participating in our 8EA report higher levels of self-confidence in their learning process than students who do not participate in the 8EA.
2. Effort Index	H2: Students in online courses participating in the 8EA report higher effort in their learning process than students who do not participate in the 8EA.
3. Motivation Index	H3: Students in online courses participating in the 8EA report higher motivation to learn the material than students who do not participate in the 8EA.
4. Inclusivity Index	H4: Students in online courses participating in the 8EA express a greater satisfaction with the different ways in which they can demonstrate their understanding of the material than students who do not participate in the 8EA.

Note. 8EA = eight engagement activities. A detailed description of the survey questions/statements linked to each hypothesis is shown in Appendix 1.

Experimental Design

The Engagement Activities: Design and Application

Learner engagement encompasses multiple interconnected dimensions, including motivation, effort invested in learning tasks, sense of inclusion within the learning community, and self-efficacy. Recognizing these dimensions guided the design of the eight engagement activities as a unified system intended to support not only students' participation, but also the depth of their learning.

A group of faculty members at a mid-size university in the U.S. designed a set of short, content and non-content related activities for their online courses defined as the eight engagement activities. The objective of the eight

engagement activities was to offer students a more meaningful and inclusive learning experience in their online asynchronous business courses. A brief description of three of the eight engagement activities is presented here. Due to space limitation, only some of the eight activities are briefly described here. The authors can provide more information about the eight activities upon request.

1. A video-recorded presentation entitled "Introducing Myself to the Class" is completed. For this assignment, students create a short video using the technology of their choice. In the video, they are asked to share hobbies and summer activities. They could also include information about their major and their expectations for the online class. Faculty provide personalized notes to every student about their video presentation. Faculty members also share a video presentation about their personal and professional activities.
2. A survey entitled "Discovering Your Academic Progress" is completed at the beginning of the class, and after each test. We ask about students' academic expectations and provide study tips along with explanations of why these strategies are effective. Students are asked to indicate which tips they plan to use during the course and which of them were used to complete each test. The objective of the survey is to encourage students to reflect on their study habits and techniques.
3. This is a content-based activity designed to evaluate knowledge beyond traditional quizzes. For example, one faculty member

assigned a team-recorded presentation on a topic, while another used team discussion-board postings. The goal is to give students the opportunity to demonstrate their understanding of the material in more collaborative and creative ways.

The eight engagement activities were completed in four online business courses, with an average of 25 students per course. The students completing these activities were defined as the experimental group. Simultaneously, the same faculty members taught four online sections of the same courses without the eight engagement activities. Students in these courses were defined as the control group.

In the experimental group syllabus, we included two extra graded evaluation items defined as class engagement activities, representing between 3% and 5% of the total grade. We also included a group project that represented between 5% and 10% of the total grade. The syllabus for the experimental group included the following statement defining class engagement:

> *Class Engagement refers to a series of activities beyond course content designed to foster a positive, inclusive, and supportive online learning environment. The group project's objective is to give you the opportunity to demonstrate your understanding of the material in a collaborative and creative way. This means you can succeed in the course by showing evidence of your academic progress through multiple ways!*

The eight engagement activities and the statement above were not posted in the syllabus of the control group. Most of the preparatory work was completed before the courses began.

The contribution of the eight engagement activities lies in their intentional design as a cohesive set of engagement activities that systematically cultivate a learning community over the entire course period, moving beyond the common practice of using one or few isolated activities with limited impact.

The Measurement Instrument

To test the four hypotheses outlined in Table 1, we employed a self-proficiency instrument commonly used in similar studies: the Motivated Strategies for Learning Questionnaire or MSLQ (Pintrich et al., 1993). Adesola and Li (2018) applied a modified MSLQ to examine self-proficiency, motivation to learn, and anxiety among college students in computer science courses. Likewise, Üner et al. (2020) applied a modified MSLQ to assess learning strategies and anxiety in foreign language courses (Bonanomi et al., 2018; Pintrich & Garcia, 2012; Tosuncuoglu, 2019). Borja and Rodriguez (2025) also applied a modified MSLQ to evaluate students' confidence and cooperation in online business college courses.

The original MSLQ (Pintrich et al., 1993) was designed to assess students' motivational orientations and their learning and self-regulation strategies within a specific course. The full instrument contains 81 items organized into two major sections: 31 items in the motivation section and 50 items in the learning

strategies section. These sections comprise 15 scales addressing constructs such as intrinsic and extrinsic goal orientation, task value, self-efficacy for learning and performance, test anxiety, rehearsal, organization, and critical thinking. The MSLQ is modular, allowing researchers to select individual scales or items that align with the objectives and context of a particular study. Accordingly, we used a subset of 16 MSLQ items to assess self-efficacy, effort regulation, motivation to learn, and students' perceptions of inclusion. Appendix 1 shows the 16 statements distributed among each index. For example, our effort index is linked to the following three MLSQ statements:

- "I plan to study hard for every test."
- "I plan to put in the effort to do well in this class."
- "With a bit of effort, I will understand the topics presented in this course."

The modified MLSQ survey was administered at the beginning and end of the semester, using a 1–7 Likert scale to assess students' level of agreement with each statement. Additionally, we collected demographic information, including age, gender, self-reported grade point average (GPA), and academic major, to support our analysis. This study was evaluated and approved by the corresponding Institutional Review Board committee.

Results

Summary of Demographic Information

Table 2 shows a summary of demographic information. A total of 270 students participated in this study. From all participants, 48.1% completed the engagement activities and are in the experimental group. The remaining 52.0% did not complete the engagement activities and are in the control group. From all participants, 57.2% identified themselves as male and 42.8% as female. Student responses only indicated male or female as their self-reported gender, even though they were given the option of selecting "other." The average age of participants is 20.2 years old. Overall, 10% of our sample are first-year students, 30.9% sophomores, 44.2% juniors, and 14.5% seniors. Overall, 65.7% of the participants are business majors.

***Table 2**: Overall Demographic Summary Statistics by Group*

Variable	All Participants (N=270)	EG (n=130)	CG (n=140)	*p*	K-S *p*
Gender				0.98	1.00
Male	57.2%	57.4%	57.1%		
Female	42.8%	42.6%	42.9%		
Age (years),	20.2	20.0	20.3	0.26	0.68
Major				0.43	1.00
Business	65.7%	63.3%	67.9%		
Non-Business	34.3%	36.7%	32.1%		
School Year				0.03	0.03
First-Year	10.4%	14.0%	7.1%		
Sophomore	30.9%	36.4%	25.7%		
Junior	44.2%	34.1%	53.6%		
Senior	14.5%	15.5%	13.6%		

Variable	All Participants (N=270)	EG (n=130)	CG (n=140)	*p*	K-S *p*
Total	270 (100%)	130 (48.1%)	140 (52.0%)		

Note. *M* = mean. EG = experimental group; CG = control group. The *p* values are derived from between-group tests of equality of means comparing the experimental and control groups. The *K-S p* reports *p* values from the Kolmogorov-Smirnov Test of equality of distributions between groups. *p* and *K-S p* values < 0.1 indicate that there is no significant difference between the distribution of both samples, and the samples in both groups are well suited for comparison.

Both the control group and the experimental group show similar demographic characteristics. For instance, the average age between groups is 20.0 for the experimental group and 20.3 for the control group. Most students are business majors (EG = 63.3%, CG = 67.9%), and the proportion of males in each group is similar between groups (EG = 57.4%, CG = 57.1%). The *p* and *K-S p* values in Table 2 confirm that there are no statistical differences between groups in almost every demographic variable using both a *p*-test of equal means, and a Kolmogorov-Smirnov test of equal distribution between groups. We observe some variation in the school year variable between groups driven by the difference in the number of juniors (EG = 34.1%, CG = 53.6%, *p* = 0.03). Appendix 2 presents the breakdown of overall demographics by professor to assess whether any differences in the sample could be influenced by the faculty. Table 2 and Appendix 2 corroborate that demographic variables provide no explanatory value to account for group differences.

Student Attitudes at the Beginning and End of the Course

Table 3 presents the four index values for the experimental group and control group at both the beginning (pre-survey) and the end of the course

(post-survey). The pre-survey results indicate no statistically significant differences between the experimental and control group across the indices, demonstrating that students in both groups reported similar levels of self-efficacy, anticipated effort, and academic motivation. For example, the self-efficacy index at the beginning of the course is statistically similar in both groups (EG = 5.29, CG = 5.16, p = 0.14).

On the other hand, the post-survey responses in Table 3 show that the experimental group has significantly higher values compared to the control group across all four indexes. By the end of the course, students in the experimental group, who completed the engagement activities, were more confident about their learning abilities (H1: Self-Efficacy, EG = 5.17, CG = 4.82, p = 0.00). These students also put in more effort to do well in the course (H2: Effort, EG = 5.65, CG = 5.34, p = 0.03) and were more motivated to learn the material (H3: Motivation, EG = 5.17, CG = 4.83, p = 0.03).

***Table 3**: Pre-Survey and Post-Survey Attitude Responses*

Index	Pre-Survey EG	Pre-survey CG	*p*	Post-Survey EG	Post-Survey CG	*p*
H1: Self-Efficacy	5.29	5.16	0.14	5.17	4.82	**0.00**
H2: Effort	6.20	6.02	0.10	5.65	5.34	**0.03**
H3: Motivation	5.44	5.34	0.41	5.17	4.83	**0.03**
H4: Inclusivity	4.90	4.64	**0.01**	4.74	4.34	**0.00**

***Note**.* Values represent mean scores on a 7-point Likert scale (1 = lowest possible score; 7 = highest possible score). EG = experimental group; CG = control group. p values are based on between-group tests comparing the experimental and control groups at each survey administration. p values < 0.1 indicate that the responses are statistically different between groups (in bold). Detailed descriptions of the attitude indices are provided in Appendix 1.

The only relevant difference in the pre-survey is found in the inclusivity index (EG = 4.90, CG = 4.64, p = 0.01), which may explain the observed difference at the end of the course for the inclusivity index (EG = 4.74, CG = 4.34, p = 0.00). The effectiveness of the activities at promoting inclusivity will therefore be assessed using other methodology (see results in Table 4).

Ordinary Least Squares Regression Analysis

Table 4 reports the results for an ordinary least squares regression. For the dependent variable, we constructed the following: The dependent variable for each model is the hypothesis difference score, calculated as the end-of-course index score minus the beginning-of-course index score for the corresponding hypothesis (H1–H4). End of Course Difference Score ranges between -6 = maximum difference between the index value at the beginning and the end of the course in which the student felt particularly poor on the index; 0 = no difference between the index values at the beginning and end of the course, and 6 = maximum difference in which the student felt in agreement with the index. The explanatory variables are a set of demographics. A variable defined as experimental group (EG) that takes the value of one if the student was in the experimental group, and zero if the student participated in the control group. It is expected that the experimental group variable takes positive and significant values, showing statistically significant improvement in our learning indexes among the experimental group participants. For example, H4 Difference Score means that we subtract the responses from student i at the beginning of the course from the responses at the end of the course for the

inclusivity index. If this student, at the end of the semester had a strong feeling of inclusivity and responded with a 7, but at the beginning of the semester their response was a 4, then the value of the H4 Difference Score is 3 (7-4) for this participant. Gender is equal to one if a participant is male and zero if they are female. Major is equal to one if a participant is a business major and zero if they are a non-business major. Finally, School Year reports the year of college each student is in: first-year, sophomore, junior, or senior.

The H1 Difference Score in Table 4 shows that students completing the engagement activities experienced significantly better self-efficacy in their understanding of the material by 0.32 points by the end of the semester or about 5.3%. We find this percentage by dividing 0.32 by 6, the maximum possible score of the dependent variable. When considering effort, students in the experimental group have significantly shown higher effort by the end of the course (0.33 points). That is, students have dedicated more time to completing coursework and missed less activities and assignments. Students in the experimental group are significantly more motivated as well, with an increase of 0.38 points or about 6.3%. In other words, students completing the engagement activities found the material more applicable and interesting than students in the control group. Finally, students in the experimental group show significantly higher feelings of inclusivity (0.22 points). Overall, our results indicate that students in the experimental group expressed significantly higher self-confidence in their learning process, willingness to put in effort, motivation to learn, and feelings of inclusivity across the semester.

Table 4: *Regressions Results for Difference Scores*

Predictor Variable	H1 Difference Score	H2 Difference Score	H3 Difference Score	H4 Difference Score
Experimental Group	0.32** (0.14)	0.33** (0.16)	0.38** (0.17)	0.22* (0.12)
Gender	-0.18 (0.14)	0.12 (0.16)	0.04 (0.17)	0.29** (0.12)
Age	-0.05 (0.03)	-0.01 (0.04)	0.02 (0.04)	0.03 (0.03)
Major (Business 1)	0.08 (0.14)	0.12 (0.17)	-0.02 (0.18)	-0.18 (0.13)
School Year	0.19** (0.09)	0.08 (0.10)	0.07 (0.11)	-0.07 (0.08)
N	147	149	149	150
R^2	0.08	0.04	0.04	0.07

Note. H1 = Self-Efficacy Index, H2 = Effort Index, H3 = Motivation Index, H4 = Inclusivity Index. The dependent variable for each model is the difference in scores, calculated as the end-of-course index score minus the beginning-of-course index score. For example, if a student, at the end of the semester had a strong feeling of inclusivity and responded with a 7, but at the beginning of the semester their response was a 4, then the value of the H4 Difference Score is 3 (7-4) for this participant. Experimental Group = 1 if the participant was in the experimental group, and zero otherwise. Coefficient values are provided first, and standard errors are in parentheses. * = 90% significance level, ** = 95% significance level, and *** = 99% significance level.

Ordered Logit Regression Analysis

Table 5 shows the results using the same variables as Table 4 but applying an ordered logit model. The odds of having a significantly higher level of self-efficacy by the end of the semester are 0.68 higher for a student in the experimental group than a student in a control group, provided other variables are held constant. Also, students in the experimental group show significantly higher odds (EG = 0.53, H2 Difference Score) of putting in more effort, all other variables held equal. Motivation to learn (EG = 0.69, H3 Difference Score) and inclusivity (EG = 0.65, H5 Difference Score) are also more probable to increase among students completing the engagement activities. Overall, the results in Table 5 further corroborate the previous results in Tables 3 and 4.

***Table 5**: Ordered Logit Regressions with Hypothesis Difference Scores*

Predictor Variable	H1 Difference Score	H2 Difference Score	H3 Difference Score	H4 Difference Score
Experimental Group	0.68** (0.30)	0.53* (0.29)	0.69** (0.30)	0.65** (0.30)
Gender	-0.59* (0.30)	0.19 (0.29)	0.17 (0.29)	0.58** (0.29)
Age	-0.09 (0.06)	-0.03 (0.06)	0.03 (0.06)	0.08 (0.06)
Major (Business = 1)	0.21 (0.32)	0.12 (0.32)	-0.14 (0.31)	-0.51 (0.32)
School Year	0.44** (0.19)	0.22 (0.19)	0.17 (0.18)	-0.11 (0.18)
N	147	149	149	150

***Note**.* EG = experimental group, H1 = Self-Efficacy Index, H2 = Effort Index, H3 = Motivation Index, H4 = Inclusivity Index. The dependent variable for each model is the hypothesis difference score, calculated as the end-of-course index score minus the beginning-of-course index score for the corresponding hypothesis (H1–H4). EG = 1 if the participant was in the experimental group, and EG=0 otherwise. Coefficient values are provided first, and standard errors are in parentheses. * = 90% significance level, ** = 95% significance level, and *** = 99% significance level.

Appendix 3 presents the results of an ordinary least square regression in which the student's final grade serves as the dependent variable. These results indicate that students who completed the engagement activities earned higher final course grades; however, these higher grades are not significantly different from those observed in the control group. We recognize that the engagement activities were constructed with the intent of lessening social distance in online courses, rather than reinforcing course material.

Discussion and Conclusion

Conclusions

Online higher education has grown in relevance, particularly within business schools, as it allows learners to pursue their studies while balancing

personal and professional goals. However, online learning presents significant challenges in many students' learning journeys. Limited peer-to-peer and student-to-instructor interactions can greatly reduce the social engagement and feedback necessary to deepen understanding of complex material and to sustain interest and effort in the subject matter. Social learning is an essential component of a successful educational experience (Bandura, 1977, 1986), yet online courses often provide limited opportunities for this crucial element (Conley et al., 2017; Reed et al., 2023). With the rapid development of new technologies, such as artificial intelligence (AI), it is imperative that higher education instructors leverage these tools to design activities that engage online learners more effectively with instructors, peers, and course content. In this way, technology can support the social processes emphasized by Bandura's (1986) social learning theory, while helping instructors address some of the social distance associated with online learning. For example, instructors can ask students to create personalized introduction videos; share brief personal stories using videos, photographs, or other media; participate in collaborative group activities; and provide feedback on their peers' work. Instructors can further strengthen this connection by providing individualized feedback and talking about students' academic and social learning experiences. These activities do not need to be complex; their value lies in creating intentional opportunities for interaction.

We recommend incorporating a series of structured engagement activities throughout the course, rather than relying on a single isolated activity, to

provide students with multiple opportunities to develop engagement, interest, and effort. As demonstrated in this study, these activities were graded to encourage participation. The activities were relatively easy for instructors to assess, enjoyable for students to complete, and designed to promote interaction among students and between students and instructors.

Using ordinary least squares and ordered logit regressions, the statistical analyses revealed meaningful differences between participants (experimental group) and non-participants (control group). Specifically, students in the experimental group showed higher feelings of engagement, effort, and inclusivity, improving the overall learning environment in online settings. A series of short, purposeful activities—such as introduction videos, personal story sharing, peer feedback, and collaborative activities—can create repeated opportunities for students to interact with their peers, communicate with the instructor, and connect course concepts to their own experiences.

Based on the findings of this study, we also recommend two areas for improvement. First, future activities should incorporate more content-related tasks, such as case studies, experiments, and business data analysis, to strengthen the connection between engagement and academic learning. Second, a more specific study-habits survey could be administered both before and after examinations rather than only after the tests, as was done in this study. These additions may help strengthen the potential impact of the activities on academic performance, an outcome for which we did not find statistically significant differences between groups.

The implementation of these activities can be easily adapted for both business and non-business courses. Evaluating and grading the activities requires relatively little time and can, in fact, be enjoyable for instructors. But instructors should recognize that engagement activities are not a substitute for effective course design and may not independently improve all academic outcomes. Group-based activities require careful planning because online students may encounter difficulties with coordination, communication, workload distribution, and differing expectations (Borja & Rodriguez, 2025).

Future research can build on these findings by refining the activities, examining which types of engagement activities are most effective, and investigating whether their effects differ across disciplines, course structures, and student populations.

Limitations of the Study

The study has limitations that suggest directions for future research. First, the study did not directly assess students' satisfaction with the individual engagement activities to better understand students' perceptions of the course experience when these targeted activities were implemented. Second, although students in the experimental group tended to achieve higher final grades than students in the control group, the difference was not statistically significant. Future implementations should more closely integrate the eight engagement activities with course content through activities such as case studies, experiments, and business data analysis, potentially strengthening the connection between engagement activities and academic content.

Appendices

Appendix 1: Indexes and MLSQ Subscale Statements

Table 6: Indexes and MLSQ Subscale Statements

Index/Hypotheses	MLSQ Subscale Statements
H1: Self-Efficacy Index	Q1. I know I can easily understand the material for this course. Q2. I know I will make a lot of errors when completing my assignments. Q3. I know I can learn this subject. Q4. I know I will understand the topics presented in this course.
H2: Effort Index	Q5. I plan to study hard for every test. Q6. I plan to put in the effort to do well in this class. Q7. With a bit of effort, I will understand the topics presented in this course.
H3: Motivation Index	Q8. This course will be useful to me when I discuss current issues with someone else. Q9. The skills I will learn in this course will make me more employable. Q10. I will enjoy taking this course. Q11. I know I will learn a new way of thinking.
H4: Inclusivity Index	Q12. I know this course will offer multiple ways to show what I learned (papers, presentations, projects, exams). Q13. I will have trouble understanding the course material because of how I think. Q14. I know I will struggle in this class because I am not good at test-taking. Q15. I'm worried because I struggle with the pressure of timed tests. Q16. I know I will get frustrated when completing tests in this course.

Note. Each statement is evaluated using a 1-7 Likert scale. The MLSQ was modified for principles of business courses. The statements were randomly shown to the participants, and not in the order presented in this table.

Appendix 2: Demographic Summary Statistics by Professor

Table 7: Demographic Summary Statistics by Professor

Variable	All Participants	EG	CG	*p*
Gender (Male/Female)				
Professor 1	66.3% / 33.7%	69.7% / 30.3%	64.8% / 35.2%	0.63
Professor 2	49.4% / 50.6%	59.5% / 40.5%	51.8% / 48.2%	**0.06**
Professor 3	53.5% / 46.5%	48.1% / 51.9%	37.8% / 62.2%	0.20
Age (years), M				
Professor 1	20.4	19.5	20.8	**0.08**
Professor 2	20.5	20.9	20.0	**0.02**
Professor 3	19.5	19.4	19.5	0.60
Major (Business/Nonbusiness)				
Professor 1	68.6% / 31.4%	70.1% / 29.9%	67.6% / 32.4%	0.76
Professor 2	66.2% / 33.8%	72.5% / 22.5%	59.5% / 40.5%	0.23
Professor 3	61.6% / 38.4%	81.5% / 18.5%	87.3% / 12.7%	0.41
Year in School, M				
Professor 1	2.7	2.2	2.8	**0.00**
Professor 2	3.0	3.1	3.0	0.39
Professor 3	2.3	2.3	2.3	0.90

Note. *M* = mean. EG = experimental group; CG = control group. *p* values are based on between-group comparisons of the experimental and control groups within each instructor's section. Bold values in the *p* column indicate statistically equal means between EG and CG. Comparisons with $p < .05$ occurred for Professor 2 age ($p = .02$) and Professor 1 year in program ($p < .001$).

Appendix 3: The Effect of the Engagement Activities on Final Grades

Table 8: The Effect of the Engagement Activities on Final Grades

Predictor Variable	H1: Self-Efficacy	H2: Effort	H3: Motivation	H4: Inclusivity
EG	0.69 (1.40)	0.59 (1.36)	1.13 (1.40)	1.80 (1.37)
Gender	-0.26 (1.38)	-1.04 (1.33)	-0.78 (1.37)	-0.33 (1.40)
Age	0.13 (0.32)	0.04 (0.31)	0.01 (0.32)	0.06 (0.32)
Major (Business = 1)	0.72 (1.43)	0.68 (1.40)	0.92 (1.45)	0.65 (1.45)
School Year	-1.17 (0.89)	-0.90 (0.85)	-0.76 (0.88)	-0.77 (0.88)
H1 Self-Efficacy Difference Score	2.38** (0.86)	—	—	—

Predictor Variable	H1: Self-Efficacy	H2: Effort	H3: Motivation	H4: Inclusivity
H2 Effort Difference Score	—	2.49*** (0.71)	—	—
H3 Motivation Difference Score	—	—	1.09 (0.69)	—
H4 Inclusivity Difference Score	—	—	—	-1.27 (0.94)
N	144	146	146	147
R^2	0.09	0.10	0.04	0.03

Note. Dependent variable = Final course grades out of 100 possible points. * = 90% significance level, ** = 95% significance level, and *** = 99% significance level. Values are unstandardized regression coefficients. Standard errors are reported in parentheses. EG = experimental group; participants in the experimental group were coded as 1 and participants in the control group were coded as 0. Major was coded as a binary variable (Business = 1). The hypothesis difference scores were calculated as the end-of-course score minus the beginning-of-course score for the corresponding index. *N* represents the number of participants included in each model. R^2 represents the proportion of variance explained by the model. $p < .10$. *$p < .05$. **$p < .01$.

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Authors

Dr. Karla Borja is an Associate Professor of Economics in the Sykes College of Business at the University of Tampa, in Tampa, Florida. Dr. Borja is an active scholar whose research explores economic development issues in Latin America. As a dedicated educator, she continually seeks innovative pedagogical approaches to enhance student learning. She also applies a scholarly, evidence-

based approach to teaching by collecting quantitative data and conducting statistical analyses to evaluate the effectiveness of instructional strategies. Drawing on these research and teaching experiences, Dr. Borja has published numerous scholarly works on pedagogy, teaching methods, and instructional innovation in higher education. For more information about Dr. Borja and her research, please visit her webpage at https://www.ut.edu/directory/borja-karla.

Dr. Christopher Roby is an Associate Teaching Professor in Economics at the University of Tampa, in Tampa, Florida. Dr. Roby is committed to student-focused, yet rigorous, instruction with emphasis on helping students develop problem-solving skills in an economics classroom. Dr. Roby focuses on implementing diverse methods and approaches to teaching to help expose students to new ways to engage with course content. Dr. Roby's research focuses on experimental and behavioral economics, applied microeconometrics, and combining the two fields in the context of evidence-based pedagogy research, leading to several publications in peer-reviewed academic journals. Dr. Roby is a proud co-editor of the University of Tampa Adam Smith Economics Honor Society student publication *The Smithian*. Further information can be found about Dr. Roby at this website: https://www.ut.edu/directory/roby-christopher

Dr Shaista Nisar is an Associate Professor of Instruction in Statistics at the Sykes College of Business, University of Tampa, in Tampa, Florida. Dr Nisar is committed to creating a supportive and engaging learning environment where students can learn, grow, and succeed. Her teaching emphasizes experiential learning, innovative teaching strategies, and real-world business examples that

help students connect classroom concepts to practical business situations and develop skills they can apply in their careers. Her research interests include business analytics, data-driven analysis, probabilistic modeling, and managerial decision-making. She is also interested in exploring teaching approaches that enhance student engagement and learning outcomes. Her research has been presented at various international conferences, and she has published in several peer-reviewed academic journals. Dr Nisar: https://www.ut.edu/directory/nisar-shaista

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The copyeditors used Microsoft Copilot to assist with formatting tables in accordance with APA Style guidelines. All table content, data, analyses, and interpretations were created and verified by the authors.