Keep Learning: Student Engagement in an Online Environment

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Abstract
Student engagement is a key factor in promoting learning and academic achievement. This study explores the factors underlying student engagement and the best practices advocated by students and faculty to engage students. Results revealed that student motivation to learn and self-efficacy are positively associated with student engagement. In addition, self-efficacy partially mediated the relationship between motivation to learn and student engagement. Finally, both faculty and students suggested diverse and inclusive techniques to engage students. Online education may become our new reality, and adjustment to this new world requires shifting to a new pedagogical paradigm.

*Keywords***:** student engagement, motivation to learn, self-efficacy, online learning, and online education

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Beginning in 2020, the coronavirus (COVID-19) pandemic disrupted the personal and professional lives of many, including students and faculty members. Around the globe, colleges and universities were forced to close their physical campuses and offer remote instruction to their students. Although remote/online instruction can be as effective as in-person learning (Allen et al., 2004), there are questions surrounding student engagement and motivation (Chiu, 2021; Siemens et al., 2013). In addition, scholars have observed that instructors with limited online teaching experience are less likely to deliver an effective online learning environment, which further compromises student motivation and engagement (Abid et al., 2021; Bao, 2020). Indeed, Chen et al. (2020) observed an overall decrease in online student engagement during the COVID-19 pandemic. Therefore, to enhance the online learning experience, we need to understand the factors that help promote student engagement and strategies that enhance online learning experience for students as well as their instructors.

Student engagement is a key element of effective learning and involves connecting students with the course, with their peers in the course, and with the instructor (Martin & Bolliger, 2018). Indeed, scholars have found that online learners are more active and engaged in their courses when they interact with the course content, their peers, and their instructors (Lear et al., 2010). Moreover, when students are engaged in their classes, they are less likely to feel isolated and more likely to maintain their desire to learn and feel satisfied with their academic performance (Banna et al., 2015; Fredricks et al., 2004). One factor that helps promote student engagement is student's motivation to learn (Hartnett, 2016; Knowles et al., 2011). Although motivation to learn is crucial to foster student engagement in an online environment, a more nuanced and integrative account of how motivation to learn is associated with student engagement is necessary to inform the effective implementation of best practices necessary for student engagement.

This study makes three contributions to the existing literature on online student engagement (referred to as "student engagement" from this point forward). First, it uses a comprehensive measure of online student engagement and examines the relationship between motivation to learn in an online environment (referred to as "motivation to learn" from this point forward) and student engagement. Indeed, researchers have conceptualized student engagement as an outcome of motivational processes that enhance persistence in learning (Deci & Ryan, 2008; Reeve, 2013). Second, it investigates whether self-efficacy in online courses (referred to as "self-efficacy" from this point forward) mediates the relationship between motivation to learn and student engagement. Self-efficacy refers to an individual's belief in his or her ability to accomplish a certain task (Bandura, 1986, 1991). Individuals who are motivated to learn are more likely to demonstrate persistence in their tasks and thus, exhibit higher levels of self-efficacy associated with those tasks. Scholars have argued that an individual's self-efficacy beliefs influence the type of activities they perform, their effort levels, and perseverance when faced with failures and obstacles, thereby enhancing engagement in the task (Bandura, 1991; Schunk, 1989). Finally, it uses both quantitative and qualitative methodologies to obtain a more holistic understanding of best practices of student engagement in an online learning environment.

Theoretical Background and Hypotheses Development

Motivation to Learn and Student Engagement

According to Brophy (1987), motivation to learn refers to a student's stable disposition to find academic activities as satisfying and worthwhile and, therefore, strive for knowledge and mastery in different learning situations. As a general trait, most individuals who display motivation to learn find learning intrinsically rewarding (Brophy, 1987). However, an individual's motivation to learn could also manifest itself as a duty-bound sense of obligation (Brophy, 1987). Social cognitive theory of human learning suggests that learning is a function of a multitude of factors such as student characteristics, behaviors, and learning environments (Bandura, 2001, 2006). Scholars have argued that individuals with a strong motivation to learn are more likely to exert the necessary effort to learn and engage with the course material than individuals with low motivation to learn (Noe, 1986; Simmering & Posey, 2009). I propose that a student's motivation to learn is positively associated with student engagement because motivated students are more likely to choose goals and activities that help enhance their classroom engagement and academic outcomes. Indeed, scholars have observed that motivated students achieve their academic goals by engaging in a variety of activities such as active class participation, class attendance, asking questions, seeking instructor's advice, and by engaging with their peers such as participating in study groups (Pajares & Schunk, 2001).

Self-efficacy, Motivation to Learn, and Student Engagement

Self-efficacy refers to an individual's perceived ability to perform a task (Bandura, 1986, 1991). According to Bandura (1977, 1991), an individual's perceptions of self-efficacy influence the amount of effort they exert on a given task and how long they persist in the face of adversity. Over the last few decades, scholars have found a variety of beneficial outcomes for individuals high in self-efficacy. For instance, individuals who are high in self-efficacy are more likely to experience positive outcomes such as high levels of positive affect (Zeiss et al., 1999), adaptive coping responses (Bandura, 1982; Coleman & Karraker, 1997), higher job satisfaction and job performance (Achenreiner et al., 2019; Judge and Bono, 2001), better academic performance (Bandura, 1997; Robbins et al., 2004), and lower levels of stress (O'Leary, 1992) and anxiety (Luszczynska et al., 2005). Moreover, high self-efficacy individuals are more motivated to perform a given task because they believe that their current skills are sufficient to achieve their goals (Noe & Wilk, 1993). This research proposes that self-efficacy mediates the relationship between motivation to learn and student engagement such that students who are motivated to learn are more likely to exert effort to perform well in the class and, therefore, perceive higher levels of self-efficacy and engagement. As mentioned previously, students who are motivated to learn are more likely to exert the necessary effort to learn and engage with the course material. Students who persist longer at a given task are more likely to engage with the material and experience higher self-efficacy levels and, therefore, achieve positive academic outcomes (Doménech-Betoret et al., 2017). For instance, Gist and Mitchell (1992) found that self-efficacy has a significant impact on performance on a variety of tasks as well as emotional reactions and persistence on a task. Furthermore, previous scholars have argued that in an online environment students perceive a holistic sense of engagement when they can interact with their instructors as well as their peers and with the course content (known as overall student engagement in this study) (Martin & Bolliger, 2018; Skrypnyk et al., 2015).

Accordingly, I proposed the following hypotheses (Figure 1) and tested them via structural modelling:

Hypotheses

Hypothesis 1: Motivation to learn is positively associated with student engagement.

Hypothesis 2: Motivation to learn is positively associated with self-efficacy.

Hypothesis 3: Self-efficacy is positively associated with student engagement.

Hypothesis 4: Motivation to learn is positively associated with overall student engagement.

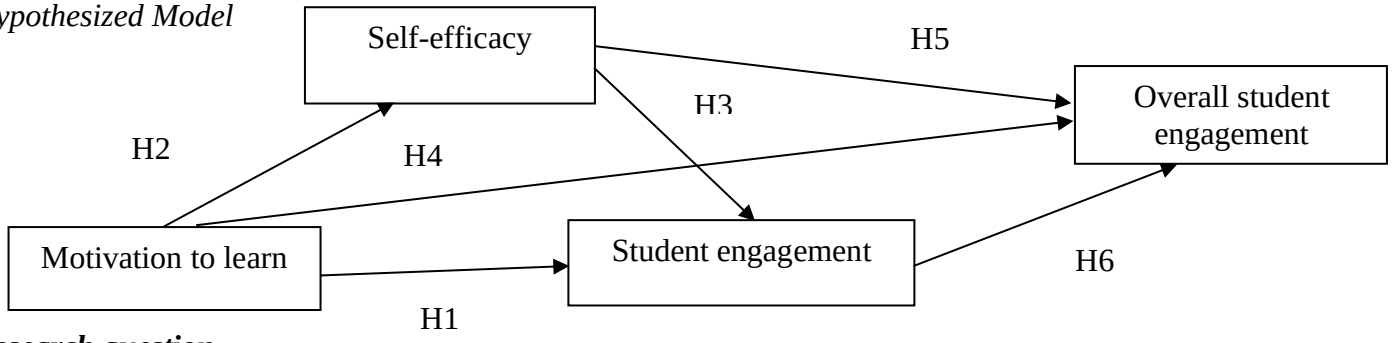
Hypothesis 5: Self-efficacy is positively associated with overall student engagement.

Hypothesis 6: Student engagement is positively associated with overall student engagement.

Hypothesis 7: Self-efficacy mediates the positive relationships between motivation to learn and student engagement and motivational to learn and overall student engagement.

Figure 1.

Hypothesized Model



Research question

Another goal of this study was to provide a deeper understanding of student and faculty opinions on strategies that foster overall student engagement in the online learning environment. Accordingly, the following open-ended research question was presented to both students and faculty participants and tested using Braun and Clarke's (2006) approach to thematic analysis:

Research Question 1: What teaching methods do students and faculty perceive as most effective and engaging in online courses?

Method

Data was collected in the middle of the pandemic from January 2021 to February 2021. Eighty-six faculty members (representing 9.07% response rate) and three hundred and forty-two students (indicating 2.41% response rate) at a public, midsized university in the Pacific Northwest participated in the study. Students and faculty members were invited to participate in a Qualtrics survey via a message posted on the university's daily news bulletin, email messages sent by department managers, and posts on the university's Reddit page. All participants were told that the research was voluntary and that the study pertained to "understanding the best practices of online learning and education during the COVID-19 pandemic." Participants were assured of their confidentiality and told that the information they provided would be used solely for research purposes. Upon completion of the survey, student respondents received an Amazon e-gift card of $5 each and faculty respondents received an Amazon e-gift card of $10 each.

The student sample was relatively young, with 316 (92.4%) in the age range of 18–25. Most faculty members (67 individuals or 77% of the sample) were between the ages of 36 and 64. Among 86 faculty members, 42 (48.3%) were female and 34 (46.0%) were male. Of the 342 students, 226 (66.1%) were female and 95 (27.8%) were male. Forty-four (50.6%) of the faculty members were satisfied with online teaching and six (6.9%) were very satisfied. On the other hand, 108 (31.6%) of the students were satisfied and 17 (5%) were very satisfied with taking

online classes at their current institution. On average, students had nine months of experience taking online classes. The average GPA of students in the sample was 3.52 (out of 4.00). Finally, students indicated their intention to graduate in a variety of disciplines such as kinesiology, studio arts, geography, history, etc. Where sufficient data was available, there wasn't any significant difference in the level of engagement among students from different majors.

Measures

Motivation to learn

Four items adapted from Noe (1986) were used to measure motivation to learn in online classes. Sample items include "I am trying to learn as much as I can from my online classes" and "I am devoting considerable amount of time to my online classes." Respondents provided ratings to each item using a five-point Likert-type scale ranging from 1 = "Strongly disagree" to 5 = "Strongly agree" with an internal consistency of $\alpha = 0.82$.

Self-efficacy

Five items from the Motivated Strategies for Learning Questionnaire (MSLQ) from Pintrich and De Groot (1990) were adapted to measure self-efficacy as it relates to performance in online classes. Sample items include "I think that I will get a good grade in my online classes" and "I know that I will be able to learn the material for my online classes." The items were rated on a five-point Likert-type scale ranging from 1 = "Strongly disagree" to 5 = "Strongly agree." The internal consistency coefficient for the scale was $\alpha = 0.89$.

Student engagement

Nineteen items from Dixson's (2015) measure of student engagement were used. The instrument measures four dimensions of student engagement in an online environment: skills, emotions, participation, and performance. The alpha coefficients of the respective dimensions were 0.77 for skills (e.g. "I make sure to study on a regular basis"), 0.81 for emotions (e.g. 'I find ways to make the course material relevant to my life'), 0.85 for participation (e.g. 'I like to have fun in online chats, discussions or via email with the instructor or other students'), and 0.65 for performance (e.g., 'I like to do well on the tests/quizzes'). The items were rated on a five-point Likert-type scale ranging from 1 = "Not at all characteristic of me" to 5 = "Very characteristic of me." The combined internal consistency coefficient for the scale was $\alpha = 0.86$.

Overall student engagement

Overall student engagement was measured with twenty-nine items from Martin and Bolliger (2018). This scale includes three dimensions: learner to learner engagement (e.g., "Students interact with peers through student presentations [asynchronously or synchronously]") and learner to instructor engagement (e.g., "The instructor creates short videos to increase instructor presence in the course"), each of which were measured with ten items each. Finally, nine items were used for the learner to content engagement dimension (e.g., "Discussions are structured with guiding questions and/or prompts to deepen their understanding of the content"). Responses were provided on a five-point Likert scale ranging from 1 = "Very unimportant" to 5= "Very important. Cronbach's alpha values for the three dimensions Ire 0.79 for learner-to-learner engagement, 0.73 for learner to instructor engagement, and 0.77 for learner to content engagement. The alpha value for the overall measure was $\alpha = 0.86$.

Control variables

Demographic variables such as age, gender (coded as Female = 1 and Male = 2), current GPA, and experience taking online classes were included as control variables. Past researchers have suggested controlling for these variables as they are likely to influence the study results. For instance, Gibson and Slate (2010) found that nontraditional-age first-year students (ages 25 and above) demonstrated higher levels of engagement compared with traditional-age first-year students (ages 24 and below). In another study, Ghusson (2016) found that female students and students with higher GPA demonstrated higher levels of engagement.

Data Analysis

Study hypotheses were tested through structural equation modeling (SEM) using AMOS (Arbuckle, 1997). The fit of the proposed model was assessed using the Chi-square goodness of fit and other fit indices such as comparative fit index (CFI) and root mean squared error of approximation (RMSEA).

In addition, I tested for full collinearity with the variance inflation factor (VIF) scores (Kock, 2015). These scores were less than 3.33 thresholds, indicating absence of collinearity. I also performed Harman's single-factor test (Harman, 1967) where the first factor in in the analysis accounted for only 14.5% of the total variance. Thus, common method bias was not likely to be a serious problem for this study (Podsakoff et al., 2003).

Results

Results for quantitative data

Means, standard deviations, coefficient alphas, and zero-order correlations for the study variables are presented in Table 1. With respect to control variables, self-efficacy was positively related to GPA ($r = 0.19$, $p < 0.01$) student engagement was positively related to age ($r = 0.11$, $p < 0.05$) and GPA ($r = 0.14$, $p < 0.05$) and negatively related to gender ($r = -0.12$, $p < 0.05$). Finally, overall student engagement was negatively associated with gender ($r = -0.17$, $p < 0.01$).

Table 1

Means, Standard Deviations, Correlations, and Reliability Estimates for Study Variables

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	
1. Age	1.09	0.36	__										
2. Gender	1.41	0.64	.02	__									
3. Experience OL Classes	10.95	8.89	.22**	-.05	__								
4. GPA	3.52	0.38	.14**	-.02	.07	__							
4. Motivation to learn	4.19	0.82	.09	-.09	.04	.08	**.82**						
5. Self-efficacy	3.89	0.80	.04	.03	.07	.19**	.30**	**.89**					
6. Student engagement	3.60	0.55	.11*	-.12*	.09	.14*	.49**	.47**	**.86**				
7. Overall student engagement	3.75	0.45	-.04	-.17**	-.05	-.09	.24**	.05	.37**	**.86**			
8. L to L engagement	3.23	0.68	-.01	-.17**	-.01	-.05	.15**	.07	.29**	.84**	**.79**		
9. L to I engagement	4.19	0.47	-.10	-.17**	-.10	-.10	.21**	-.02	.24**	.72**	.36**	**.73**	
10. L to C engagement	3.84	0.55	.01	-.06	-.02	-.07	.24**	.05	.35**	.83**	.55**	.49**	**.77**

Note. N = 329. Age is coded as 1 for 18-25, 2 = 26-35, 3 = 36-50, 4 = 51 and over 51. Gender is coded as 1 = Male and 2 = Female. Experience OL Classes is the number of months experience taking online classes. Engg. = Engagement

** $p < .01$, *$p < .05$

Before testing the hypothesized model (Figure 1), a measurement model was estimated to test for common method variance. Since online student engagement and overall student engagement scales had large number of items, item parceling approach for data analyses was utilized (Little et al., 2002). Based on Dixson's (2015) theoretical framework, the online student engagement scale was grouped into four parcels: (a) skills, (b) emotion, (c) participation, and (d) performance. The overall student engagement scale was parceled based on the factors derived from exploratory factor analysis as indicators (Floyd & Widamen, 1995).

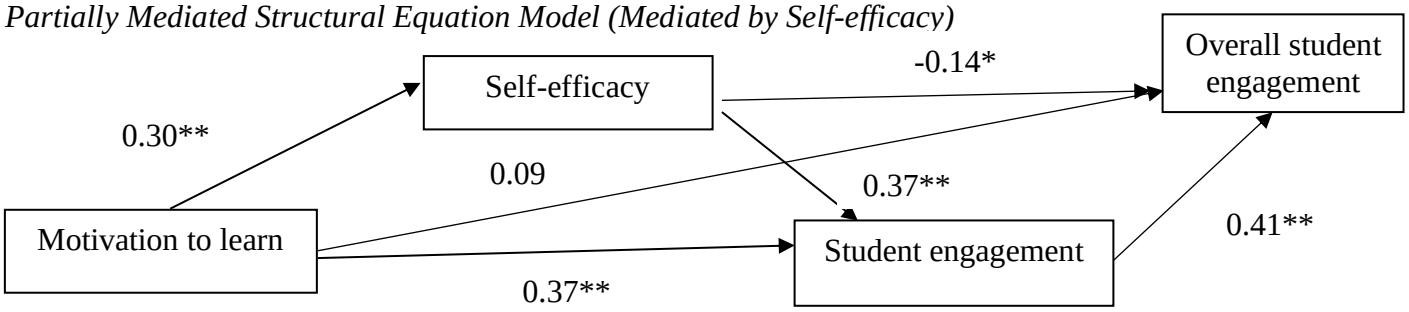
With respect to reliability, the factor loadings ranged from 0.43 to 0.70 for online student engagement, 0.55 to 0.70 for overall student engagement, 0.75 to 0.83 for self-efficacy, and 0.65 to 0.78 for motivation to learn. All indicators with loadings less than 0.7 were analyzed and the results indicated that deletion of these indicators would not increase the respective composite reliability. The assessment of the composite reliability (CR) showed that all constructs (except student engagement with CR = 0.64) had a value greater than 0.7, which indicates sufficient internal consistency reliability. With respect to validity, a reasonable convergent validity was found, as the values of average variance extracted (AVE) exceeded 50% for all the constructs (except student engagement with AVE = 0.31) (Fornell & Larcker, 1981). Discriminant validity was estimated through the heterotrait-monotrait ratio (HTMT) method (Henseler et al., 2015). The majority of the HTMT ratios were less than the threshold of 0.9. Thus, the reliability and

validity of the measures used was satisfactory. Finally, as is typical in any confirmatory factor analysis (CFA) with a large sample size (Kelloway, 1998), the Chi-square associated with the proposed model was significant, ($\chi 2$ (df= 50) = 191.02, $p < 0.001$). However, the RMSEA of 0.09 and the CFI of 0.86 indicated an acceptable fit to the data.

Individual hypotheses were tested by examining the statistical significance of the path coefficients among the latent variables (Figure 2). Hypothesis 1 was supported. That is, motivation to learn was associated with student engagement ($\beta = 0.37$, $p < 0.001$). Hypothesis 2 was supported, as motivation to learn was positively associated with self-efficacy ($\beta = 0.30$, $p < 0.001$). Hypothesis 3, that predicted a positive relationship between self-efficacy and student engagement, was supported ($\beta = 0.37$, $p < 0.001$). Hypothesis 4 that predicted a positive relationship between motivation to learn and overall student engagement was not supported ($\beta = 0.09$). In addition, Hypothesis 5 predicted a positive relationship between self-efficacy and overall student engagement was not supported ($\beta = -0.14$). Finally, Hypothesis 6 was supported, suggesting that student engagement was positively associated with the overall student engagement ($\beta = 0.41$, $p < 0.001$). Finally, the R^2 for overall student engagement was 19% and therefore the model shows adequate predictive accuracy.

Figure 2

Partially Mediated Structural Equation Model (Mediated by Self-efficacy)



Note. Values represent standardized regression weights.
** $p < .001$
* $p < .05$

To test the proposed mediation model (Hypothesis 7), the direct paths from motivation to learn to student engagement and motivation to learn to overall student engagement were constrained to zero, to test if the relationship was fully mediated by self-efficacy. This model, Model 1, had poor fit $\chi 2$ (df = 5) = 76.34, $p < 0.00$, RMSEA of 0.21, and CFI of 0.74. Thus, there was no support for full mediation. The proposed full mediation model was then compared with partially mediated and no mediation models. In the partial mediation model (Model 2), the direct paths between motivation to learn to student engagement and motivation to learn to overall student engagement were freely estimated. This model had a good fit with the data according to multiple indices. The chi-square associated with this partial mediation model was $\chi 2$ (df = 3) = 11.35, $p = 0.01$. In addition, the RMSEA of 0.09 and the CFI of 0.97 indicated good fit to the data. Finally, I tested another version of the model with no mediation, where self-efficacy did not mediate the relationships between motivation to learn to online student engagement and motivation to learn to overall student engagement. This model, Model 3, was worse than Models 1 and 2 with $\chi 2$ (df = 5) = 77.91, $p < 0.00$, RMSEA of 0.21 and CFI of 0.74. Overall, Hypothesis 7 was partially supported, as self-efficacy partially mediated the relationship between motivation

to learn and student engagement but did not mediate the relationships between motivation to learn and overall student engagement.

Results for qualitative data

In response to the open-ended question, "What teaching methods do students and faculty perceive as most effective in online courses?" both faculty and students suggested diverse and inclusive techniques to engage students and enhance the online educational experience. I compiled all the faculty and student responses and analyzed the respective results for emerging themes. More specifically, I used Braun and Clarke's (2006) approach to thematic analysis. The data was coded based on the inductive thematic analysis approach. Under the inductive approach, themes are identified independently of existing theoretical frameworks or categories. These themes were effective communication, prompt feedback, organized course structure and delivery, improve inclusivity, and access (Table 2).

Table 2

Best Practices of Online Teaching for Student Engagement: Student and Faculty Recommendations

Best practices	Student recommendations	Faculty recommendations
Effective communication	"Communicate clearly and frequently through learning management system (LMS) (i.e., canvas, blackboard, etc.) announcements/messaging or email."	"Communicate with students via the LMS or email, at least 48 hours before the course starts, with clear information about course modality, how to access course materials, and when/where to log in for the first session if synchronous."
	"Keep lectures under 30 minutes if creating them for students to watch outside of class. If the instructor has a lot that they want to say they should consider creating a series of mini lectures."	"For asynchronous courses, communicate in a predictable and consistent manner with students (e.g., weekly, or twice-weekly digests, regular opportunities for consultation). Increase communication frequency around quiz/exam and project deadlines."
		"For asynchronous or flipped synchronous courses (i.e., any course where students watch recorded videos on their own time and then complete activities), keep videos brief where possible: 6–12 minutes for simple expository lecture, up to 20 minutes for intensive problem solving if absolutely necessary."
Organized course structure and delivery	"Have students use the 'raise hand' reaction on Zoom to give other students a chance to speak and to help others know whose turn it is to speak."	"Organize materials and due dates in the LMS in as consistent a manner as possible from week to week."
	"Create a class set of norms with student input to help foster a sense of class community-especially important for synchronous classes with lots of group discussions."	"Use tools to increase student interaction and engagement with audio/video content, e.g., interactive Forms in Microsoft Stream, or insertion of questions via Panopto video."

		"For all courses, engage students in a norm-setting discussion early in the course. For synchronous sessions, norms can be discussed in breakout rooms by having students add their own norms to group-specific template documents which can then be compiled by the instructor after sharing-out. For asynchronous courses, discussion boards can be organized to facilitate this discussion."
		"Use a Day 1 'exit slip' / survey as an opportunity for students to reflect on their goals with the course and to optionally share a bit about themselves and their experiences with remote/online learning. This opportunity helps students know that the instructor is committed to helping them meet their personal goals, not just the instructor's mandated content delivery."
Improved inclusivity and access	"Provide students multiple options for completing assignments given the technology that they have, as well as access to other resources."	"For videoconference-based meetings, discuss the variety of ways for students to contribute, e.g., chat windows, how to virtually raise their hand, etc. It is worth taking the time to walk students through the interface as some may be new to it."
	"Provide students with multiple opportunities to share their feedback throughout the academic session, to gain student insight on how to improve the online course."	"For videoconference-based meetings, lower barriers to success for under-resourced or marginalized students by explicitly discussing why it's okay for students in your class to have cameras off and how it is important for everyone to invest the extra effort to listen equally effectively to voices with cameras off as with cameras on."
		"Best practices for accessibility are just as important in teaching online as in person: turn on live captions (and show students how to hide subtitles if they find it distracting); provide alt-text for all digital images used in the course; correct typos in auto-captioning software (this may not be possible from a time management perspective, in which case, lobby your department/program chair for resources, e.g., student staff assistance, with captioning)."

Discussion

The past two decades have seen a dramatic increase in research on student engagement with important implications for students, instructors, and academic institutions (D'Mello, 2021). Researchers have noted several benefits of student engagement including, delivery of high-quality learning experiences (Kuh, 2009), higher graduation rates (Price & Tovar, 2014), student retention and learning outcomes (Coates, 2005), enhancement of institutional reputation (Kuh et

al., 2006), stronger academic performance (Bono, 2011), and greater connections with peers and the institution (Masika & Jones, 2016). The primary objective of this study was to understand how motivation to learn influences student self-efficacy and engagement. It also explored student and faculty strategies to help enhance student engagement.

The findings have important implications. First, the positive relationship between motivation to learn and student engagement suggests that desire to learn is an important factor in engaging students. In other words, when students are motivated to learn, they are more likely to consider the learning process as one where they want to be involved. This suggests that motivation to learn provides the necessary fuel for various learning-oriented behaviors and psychological processes. However, it is also possible that highly engaged students are more likely to feel motivated to learn, which may further increase their level of engagement. Future research should, therefore, conduct longitudinal studies to examine the causal and non-recursive relationships between motivation to learn and engagement.

Second, the result that motivation to learn was positively associated with self-efficacy is not surprising and suggests that motivation can serve as an important supporting factor in enhancing a student's belief in their capabilities. It is possible that motivation to learn encourages students to work hard by showing them that their efforts are worthwhile and, therefore, increases their levels of self-efficacy. Researchers should explore the mediating role of effort and task significance on self-efficacy.

Third, the positive association between self-efficacy and student engagement suggests that students with high self-efficacy are more likely to feel engaged. This finding is consistent with previous scholars who have argued that students high in self-efficacy are more likely to invest emotionally and cognitively in their work and to participate actively in their course assignments (Azila-Gbettor et al., 2021; Singh & Abdullah, 2020). Taken together, this finding suggests that cultivating students' self-efficacy may serve as an important step to engagement in academic activities and tasks. Researchers should further investigate the specific process by which self-efficacy influences student engagement.

Fourth, this study further extends the literature on student engagement by examining self-efficacy as a mediator in the relationship between motivation to learn and engagement. I found that self-efficacy partially mediated the relationship between motivation to learn and student engagement. Overall, this finding is significant as it suggests that self-efficacy leverages the effect of motivation to learn on engagement. Given that engagement is a demanding process, self-efficacy serves as a valuable resource in channeling motivation to learn into engagement and its desired benefits. Future scholarship should continue to investigate other possible mediators and outcomes of these relationships.

Finally, the qualitative results highlight diverse and inclusive techniques to engage students and to enhance the online educational experience, both for the faculty and for the students. Examples include thoughtful and inclusive course design and structure, content variety, prompt instructor feedback, and communication. This finding agrees with previous research on online learning and indicates that instructional activities that involve interaction between students, between students and the content, and between students and the instructors, are more likely to be appraised as engaging by the students (Laili & Nashir, 2021). Overall, these results suggest that instructors can successfully use online tools and technology to encourage high levels of engagement (Soffer & Nachmias, 2018) and discussion (Chen et al., 2018) as well as promote deeper and richer forms of learning (Manning-Ouellette & Black, 2017).

Practical Implications

Taken together, the findings raise practical implications and suggest that equipping students with steps to enhance their self-efficacy and motivation to learn is key to better engagement. These results have significant implications for instructors, academic institutions, and stakeholders, who ~~s~~hould recognize students' motivation to learn and self-efficacy as vital resources. Instructors and academic institutions can, therefore, benefit from developing and implementing educational policies that help cultivate students' motivation to learn and self-efficacy. Results from the qualitative data suggest that one size doesn't fit all, and instructors and academic institutions should focus on a learner-centric approach to education. This approach calls for instructors to take student engagement into consideration when designing their course structure and content. Moreover, instructors and their institutions can benefit from investing in resources that promote content accessibility and inclusivity to enhance student engagement.

Limitations

This study is not without its limitations. The first limitation of the study was its cross-sectional design and use of self-report data that raise the issue of common method bias and social desirability responding. I tried to address these issues by running collinearity tests and controlling for several variables that may have an influence on my outcome variable, student engagement. In addition, I used anonymous surveys that may have helped reduce any social desirability bias. Nevertheless, future researchers should consider using other research designs and multi-source data. For instance, in a multi-source study, self-reports of student motivation to learn and self-efficacy could be matched with instructors reports of student engagement. Another limitation of this study was the convenient nature of a university-wide data-collection method, because of which the gender distribution of the final sample (66% female) was not entirely representative of the overall university environment (with 57% female).

Although this distribution is consistent with other research on student engagement (e.g., Stark, 2019), future research should employ other approaches such as stratified sampling approach across all gender identities and groups. A third limitation of this research is that it did not collect information on the type, subject, and level of online courses taken by the students. Prior research on online learning and education suggests that these factors may have an impact on a student's motivation to learn, self-efficacy, and engagement (Glick et al., 2019; Stark, 2019; Zilka et al., 2019). Future research should examine these and other possible individual and contextual level variables. A final limitation of this study is that it examines one linear direction in my model. Specifically, it models motivation to learn as a predictor of self-efficacy and engagement. However, it is possible that engaged students may become more motivated to learn over time. Moreover, it examines self-efficacy as a possible mediating mechanism through which motivation to learn influences engagement. It is possible that neither motivation nor self-efficacy beliefs operate in a single linear path but fluctuate over time or based on the course content and instructional style. Future scholars should examine the engagement process through multiple perspectives and theoretical rationales.

Conclusion

This study extends the literature on student engagement by providing an overview of the processes by which motivation to learn may influence student engagement. The results indicate that motivation to learn influences student engagement both directly as well as indirectly through enhanced self-efficacy. In addition, it identifies several effective strategies for engaging students

in an online environment. Examples include prompt instructor feedback and communication, diversified means of content delivery, and the provision of a learning environment that fosters inclusivity and participation. The results from this study can be used to enhance the online education experience in the post COVID-19 era.

Declarations

The author declares that there is no conflict of interest in this study.

The author received approval from the institutional review board of the Western Washington University, USA for this study.

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References

Abid, T., Zahid, G., Shahid, N., & Bukhari, M. (2021). Online teaching experience during the COVID-19 in Pakistan: Pedagogy–technology Balance and Student Engagement. *Fudan Journal of the Humanities and Social Sciences*, 1–25.

Achenreiner, G., Kleckner, M. J., Knight, P., & Lilly, B. (2019). Student self-efficacy, employee engagement, and community vitality: a collaborative data collection model for regional workforce development. *Journal of Education and Work, 32*(6-7), 614–632.

Allen, M., Mabry, E., Mattrey, M., Bourhis, J., Titsworth, S., & Burrell, N. (2004). Evaluating the effectiveness of distance learning: A comparison using meta-analysis. *Journal of communication, 54*(3), 402–420.

Arbuckle, J. L. (1997). Amos user's guide version 3.6. Chicago. *SmallWaters Corporation.*

Azila-Gbettor, E. M., Mensah, C., Abiemo, M. K., & Bokor, M. (2021). Predicting student engagement from self-efficacy and autonomous motivation: A cross-sectional study. *Cogent Education, 8*(1), 1942638.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, *84*(2), 191.

Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist*, *37*(2), 122.

Bandura, A. (1986). The explanatory and predictive scope of self-efficacy theory. *Journal of Social and Clinical Psychology*, *4*(3), 359–373.

Bandura, A. (1991). Social cognitive theory of self-regulation. *Organizational Behavior and Human Decision Processes*, *50*(2), 248–287.

Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology*, *52*(1), 1–26.

Bandura, A. (2006). Guide for constructing self-efficacy scales. *Self-efficacy Beliefs of Adolescents*, *5*(1), 307–337.

Banna, J., Lin, M. F. G., Stewart, M., & Fialkowski, M. K. (2015). Interaction matters: Strategies to promote engaged learning in an online introductory nutrition course. *Journal of Online Learning and Teaching/MERLOT, 11*(2), 249.

Bao, Ii. 2020. COVID-19 and online teaching in higher education: A case study of Peking University. *Human Behavior and Emerging Technologies 2*(2), 113–115.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101.

Brophy, J. (1987). Synthesis of research on strategies for motivating students to learn. *Educational Leadership, 45*(2), 40–48.

Chen, B., Chang, Y. H., Ouyang, F., & Zhou, W. (2018). Fostering student engagement in online discussion through social learning analytics. *The Internet and Higher Education, 37,* 21–30.

Chen, E., Kaczmarek, K., & Ohyama, H. (2020). Student perceptions of distance learning strategies during COVID-19. *Journal of Dental Education*.

Chiu, T. K. (2021). Student engagement in K-12 online learning amid COVID-19: A qualitative approach from a self-determination theory perspective. *Interactive Learning Environments*, 1–14.

Coates, H. (2005). The value of student engagement for higher education quality assurance. *Quality in Higher Education*, *11*(1), 25–36.

Coleman, P. K., & Karraker, K. H. (1998). Self-efficacy and parenting quality: Findings and future applications. *Developmental Review*, *18*(1), 47–85.

Deci, E. L., & Ryan, R. M. (2008). Self-determination theory: A macrotheory of human motivation, development, and health. *Canadian Psychology/Psychologie Canadienne, 49*(3), 182.

Dixson, M. D. (2015). Measuring student engagement in the online course: The Online Student Engagement scale (OSE). *Online Learning*, *19*(4), n4.

D'Mello, S. K. (2021). *OECD Digital Education Outlook 2021: Pushing the frontiers with artificial intelligence, blockchain and robots*. OECD.

Doménech-Betoret, F., Abellán-Roselló, L., & Gómez-Artiga, A. (2017). Self-efficacy, satisfaction, and academic achievement: The mediator role of students' expectancy-value beliefs. *Frontiers in Psychology, 8,* 1193.

Floyd, F. J., & Widaman, K. F. (1995). Factor analysis in the development and refinement of clinical assessment instruments. *Psychological Assessment, 7*(3), 286.

Fornell, C., & Larcker, D. F. (1981). Structural equation models with unobservable variables and measurement error: Algebra and statistics. *Journal of Marketing Research, 18*(3), 382–388.

Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of Educational Research, 74*(1), 59–109.

Ghusson, M. (2016). *Understanding the engagement of transfer students in four-year institutions: A national study* [Unpublished doctoral dissertation]. Seton Hall University.

Gibson, A. M., & Slate, J. R. (2010). Student engagement at two-year institutions: Age and generational status differences. *Community College Journal of Research and Practice, 34*(5), 371–385.

Gist, M. E., & Mitchell, T. R. (1992). Self-efficacy: A theoretical analysis of its determinants and malleability. *Academy of Management Review*, *17*(2), 183–211.

Glick, D., Cohen, A., Festinger, E., Xu, D., Li, Q., & Warschauer, M. (2019). Predicting success, preventing failure. In *Utilizing learning analytics to support study success* (pp. 249–273). Springer.

Harman, H.H. (1967). *Modern factor analysis*. University of Chicago Press.

Hartnett, M. (2016). *Motivation in online education*. Springer.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science, 43*(1), 115–135.

Judge, T. A., & Bono, J. E. (2001). Relationship of core self-evaluations traits—self-esteem, generalized self-efficacy, locus of control, and emotional stability—with job satisfaction and job performance: A meta-analysis. *Journal of Applied Psychology*, *86*(1), 80.

Kock, N. (2015). Common method bias in PLS-SEM: A full collinearity assessment approach. *International Journal of e-Collaboration (IJeC)*, *11*(4), 1–10.

Kelloway, E. K. (1998). *Using LISREL for structural equation modeling: A researcher's guide*. Sage.

Knowles, M. S., Holton, E. F., & Swanson, R. A. (2005). *The adult learner* (6th ed.) Elsevier.

Kuh, G. D. (2009). The national survey of student engagement: Conceptual and empirical foundations. *New Directions for Institutional Research*, *2009*(141), 5–20.

Kuh, G. D., Kinzie, J. L., Buckley, J. A., Bridges, B. K., & Hayek, J. C. (2006). *What matters to student success: A review of the literature* (vol. 8). National Postsecondary Education Cooperative.

Laili, R. N., & Nashir, M. (2021). Higher education students' perception on online learning during COVID-19 pandemic. *Edukatif: Jurnal Ilmu Pendidikan*, *3*(3), 689–697.

Lear, J. L., Ansorge, C., & Steckelberg, A. (2010). Interactivity/community process model for the online education environment. *Journal of Online Learning and Teaching*, *6*(1), 71–77.

Little, T. D., Cunningham, W. A., Shahar, G., & Widaman, K. F. (2002). To parcel or not to parcel: Exploring the question, weighing the merits. *Structural Equation Modeling*, *9*(2), 151–173.

Luszczynska, A., Gutiérrez-Doña, B., & Schwarzer, R. (2005). General self-efficacy in various domains of human functioning: Evidence from five countries. *International journal of Psychology*, *40*(2), 80–89.

Manning-Ouellette, A., & Black, K. M. (2017). Learning leadership: A qualitative study on the differences of student learning in online versus traditional courses in a leadership studies program. *Journal of Leadership Education*, *16*(2), 59.

Martin, F., & Bolliger, D. U. (2018). Engagement matters: Student perceptions on the importance of engagement strategies in the online learning environment. *Online Learning*, *22*(1), 205–222.

Masika, R., & Jones, J. (2016). Building student belonging and engagement: insights into higher education students' experience of participating and learning together. *Teaching in Higher Education*, *21*(2), 138–150.

Noe, R. A. (1986). Trainees' attributes and attitudes: Neglected influences on training effectiveness. *Academy of Management Review*, *11*(4), 736–749.

Noe, R. A., & Wilk, S. L. (1993). Investigation of the factors that influence employees' participation in development activities. *Journal of Applied Psychology*, *78*(2), 291.

O'Leary, A. (1992). Self-efficacy and health: Behavioral and stress-physiological mediation. *Cognitive Therapy and Research*, *16*(2), 229–245.

Pajares, F., & Schunk, D. H. (2001). Self-beliefs and school success: Self-efficacy, self-concept, and school achievement. *Perception*, *11*(2), 239–266.

Pintrich, P. R., & De Groot, E. V. (1990). Motivational and self-regulated learning components of classroom academic performance. *Journal of Educational Psychology*, *82*(1), 33.

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of Applied Psychology*, *88*(5), 879.

Price, D. V., & Tovar, E. (2014). Student engagement and institutional graduation rates: Identifying high-impact educational practices for community colleges. *Community College Journal of Research and Practice*, *38*(9), 766–782.

Reeve, J. (2013). How students create motivationally supportive learning environments for themselves: The concept of agentic engagement. *Journal of Educational Psychology*, *105*(3), 579.

Robbins, S. B., Lauver, K., Le, H., Davis, D., Langley, R., & Carlstrom, A. (2004). Do psychosocial and study skill factors predict college outcomes? A meta-analysis. *Psychological Bulletin*, *130*(2), 261.

Schunk, D. H. (1989). Social cognitive theory and self-regulated learning. In *Self-regulated Learning and Academic Achievement* (pp. 83–110). Springer.

Siemens, L., Althaus, C., & Stange, C. (2013). Balancing students 'privacy concerns while increasing student engagement in e-learning environments. In *Increasing Student Engagement and Retention in E-Learning Environments: Web 2.0 and Blended Learning Technologies*. Emerald Group Publishing Limited.

Simmering, M. J., Posey, C., & Piccoli, G. (2009). Computer self-efficacy and motivation to learn in a self-directed online course. *Decision Sciences Journal of Innovative Education*, *7*(1), 99–121.

Singh, K., & Abdullah, B. (2020). Influence of self-efficacy on student engagement of senior secondary school students. *Executive Editor*, *11*(01), 119.

Skrypnyk, O., Joksimović, S., Kovanović, V., Gašević, D., & Dawson, S. (2015). Roles of course facilitators, learners, and technology in the flow of information of a cMOOC. *The International Review of Research in Open and Distributed Learning*, *16*(3).

Soffer, T., & Nachmias, R. (2018). Effectiveness of learning in online academic courses compared with face-to-face courses in higher education. *Journal of Computer Assisted Learning*, *34*(5), 534–543.

Stark, E. (2019). Examining the role of motivation and learning strategies in student success in online versus face-to-face courses. *Online Learning*, *23*(3), 234–251.

Zeiss, A. M., Gallagher-Thompson, D., Lovett, S., Rose, J., & McKibbin, C. (1999). Self-efficacy as a mediator of caregiver coping: Development and testing of an assessment model. *Journal of Clinical Geropsychology*, *5*(3), 221–230.

Zilka, G. C., Rahimi, I. D., & Cohen, R. (2019). Sense of challenge, threat, self-efficacy, and motivation of students learning in virtual and blended courses. *American Journal of Distance Education*, *33*(1), 2–15.