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The Influence of Course Community and Personal Community Support on Learner Engagement in Online Courses

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Abstract

Learner engagement in online courses is impacted by a wide variety of factors. The purpose of this study was to understand to what extent course community support and personal community support influence learner engagement. Students who had recently completed an online course in a small art and design school were surveyed on their level of engagement in the course, experience of the course community of inquiry, and their level of personal social support, with 74 students participating. The survey responses were used in a stepwise multiple regression analysis to create a model that explains to what extent course community and personal community explain variations in learner engagement. 74. 40% of variations in learner engagement could be explained on the basis of course community and personal community support. The results are significant in that they help course designers, instructors, and university support staff understand the interaction between course community, personal community, and learner engagement. That understanding could be used to design both online course content and intervention strategies to maximize learner engagement.

Keywords: Learner engagement, community, Academic Community of Engagement, Community of Inquiry

Declarations

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The Influence of Course Community and Personal Community Support on Learner Engagement in Online Courses

Abstract

Learner engagement in online courses is impacted by a wide variety of factors. The purpose of this study was to understand to what extent course community and personal community influence learner engagement. At a small art and design school, 74 students were surveyed on their level of engagement in a recent online course, experience of the course as a community of inquiry, and their level of personal social support. The survey responses were used in a stepwise multiple regression analysis to create a model that explains to what extent course community and personal community explain variations in learner engagement. We found 40% of variations in learner engagement could be explained on the basis of course community and personal community support. The results can help course designers, instructors, and university support staff understand the interaction between course community, personal community, and learner engagement, which in turn can be used to design both online course content and intervention strategies to maximize learner engagement.

Keywords: Learner engagement, community, Academic Community of Engagement, Community of Inquiry

Learner engagement is a complex construct impacted by a variety of factors that take place both within an online course and outside the online learning experience (Hew, 2016; Jaggars & Xu, 2013; O'Shea et al., 2015; Pawan et al., 2003; Picciano, 2002). For example, researchers have found that pre-existing qualities of learners such as self-efficacy and self-regulation can impact engagement (Kim et al., 2015; Strang, 2017). Factors related to an instructor's involvement in a course can also impact engagement, including time spent by an instructor building course content, course design strategies, the modality of an instructor's feedback, and the frequency and timeliness of communication (Ice et al., 2007; Jaggars & Xu, 2016; Ma et al., 2015; O'Shea et al., 2015; Tayebinik & Puteh, 2013). Findings such as these can leave an instructor or instructional designer confused on how best to create and support learner engagement and which practices are more likely to increase learner engagement in online courses.

Researchers have created a variety of frameworks to explain the complex factors that influence learner engagement. For instance, Coates (2007) proposed that learner engagement should be thought of in terms of social engagement and academic engagement, with different learners displaying different profiles of engagement depending on subject area. Later Borup et al. (2014) proposed that engagement, at least at the K-12 level, is influenced in part by the engagement of a student's teacher, parent(s), and peers. Borup et al. (2014) initially posited that the overlap of engagement by outside parties has the greatest influence on learner engagement. Then a few years later, Bigatel and Edel-Malizia (2018), focusing on higher education, identified 30 research-supported indicators that impact engagement; they then classified these factors as being either behavioral, cognitive, or social.

Each of these frameworks, while adding to an understanding of engagement, also complicates not only engagement research but the practice of online learning. We contend that these long lists of factors actually leave practitioners concluding that any factor can increase engagement in an online course. There is a need within engagement research to simplify the findings. The goal of any framework should be to identify factors that influence engagement but do so in a parsimonious way that clarifies the construct of engagement rather than obscuring it (Whetten, 1989).

Borup et al. (2020), recently, attempted to create a parsimonious framework for learner engagement that could apply to all learners. They proposed that learner engagement is impacted by personal community support and course community support. In other words, a student's perception of community within a course and within a person's life has a significant impact on a student's ability to engage in learning. They conceptualize course community as the time-bound support that a student receives in an online class through relationships that are built directly in

the context of that course. Thus, relationships with other students and with an instructor are all part of a given course community. They conceptualized personal community, in contrast, as not being time bound. It is the relationships with friends and family that a student has before a course begins and that will continue after a course is over. For Borup et al. (2020), every student has an independent level of engagement that is possible without any outside sense of community. What a student can do independently, however, is influenced by the support of those around them, a similar concept to Vygotsky's (1978) Zone of Proximal Development. In this case, Borup et al. (2020) proposed that a student's level of engagement is positively influenced by a sense of course community and personal community. If Borup et al. (2020) are correct, then course community and personal community, alone or in combination, are critical in creating and sustaining student engagement in online coursework.

We set out in this study to explore factors that influence learner engagement, focusing specifically on to what extent course community and personal community influence engagement in an online learning experience. In the following paper, we report the results of our inquiry and the implications for future research and practice.

Review of Literature

Learner engagement refers to a learner's interest, motivation, and effort in learning a topic (Dixson, 2015). While engagement is not often identified as a main goal of an online course, research indicates engaged learners have better outcomes (Casimiro, 2015; Gray & DiLoreto, 2016; Martin & Bolliger, 2018).

Research over the years has highlighted the impact of learner engagement. For instance, Gray and DiLoreto (2016) found evidence that stronger student engagement leads to stronger student satisfaction and stronger perceived learning. Students who have a positive learning

experience are more likely to persist in their course and more likely to continue in their degree program (Roorda et al., 2011). However, simply having a positive experience is only the beginning of how engagement can impact an online learning experience.

Learner engagement is also associated with stronger learner achievement. Tayebinik and Puteh (2013) found that online learners who engaged in course interactions, including student to teacher, student to student, and group discussions were more likely to earn a passing grade. Hughes et al. (2008) found that students who demonstrated effortful engagement, as measured by teacher-report, displayed stronger growth in academic achievement over a three-year period with that level of engagement serving as a mediator for past achievement. Reyes et al. (2012) demonstrated that learner engagement can impact student grades, even mediating the impact of a negative classroom emotional climate. And then Wang (2017) found that behavioral engagement in problem-solving activities led to an increase in learner achievement in a blended classroom. Though not all of these findings are focused on online courses, the impact of engagement is consistent across modalities. Simply put, research has shown that engaged students achieve at a higher level. Thus, the relationship between student engagement and student satisfaction, perceived learning, and course grades and graduation rates highlights the importance of engagement in online courses.

Community and Online Learning

Similar to learner engagement, course community is a complex construct. McMillan and Chavis (1986) defined community as "a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together" (p. 9).

Influenced by educators' interest in community and learning during the 1990s, Rovai (2002a, 2002b) began investigating if and how a sense of classroom community can develop in online courses. Building on previous work like that of McMillan and Chavis, Rovai (2002b) explained that "members of strong classroom communities have feelings of connectedness . . . duties and obligations to each other and to the school and . . . a shared faith that members' educational needs will be met through their commitment to shared learning goals" (p. 199). Rovai's research showed that a sense of classroom community can be developed in online courses. This prompted other researchers to identify how instructional designers and online educators can build a sense of classroom community in online courses and programs. Among other things, researchers have found that using collaborative activities such as discussions, VoiceThreads, and peer review can help a sense of classroom community to emerge (Fiock, 2020; Trespalacios & Perkins, 2016; Richardson & Swan, 2003). Others found that a strong teaching presence is one of the best predictors that a sense of community will emerge in an online course (Conrad, 2005; Kerhwald, 2008; Young & Bruce, 2011). In fact, Bliss and Lawrence (2009) found that the more involved an instructor was within discussions, the stronger the student's perception of learning; the inclusion of a strong instructor voice within the course helped students to feel more connected to the course community overall.

Personal Community Support

Though research has shown that parental level of education impacts engagement and that parental support can be instrumental in K-12 online learning success, less research has explored how personal community support influences engagement in a higher education online course setting (Borup et al., 2016; Hu & Kuh, 2002).

Existing studies of face-to-face learners indicate that social support has a complex relationship with academic achievement and engagement. Hernandez, Oubrayrie-Roussel, and Prêteur (2016) found that social support can have a positive or negative impact on academic achievement for secondary students depending on a student's personal achievement goals. In other words, a strong social network without strong personal achievement goals may lead a student to achieve less in classes, not more. However, a strong social network in combination with academic achievement goals leads to greater achievement. Li et al. (2018) found that social support's impact on achievement is mediated by self-esteem with greater social support leading to greater self-esteem and then to greater achievement.

Roksa and Kinsley (2019) found that family emotional support is correlated both with persistence in courses and with a GPA of 3.0 or higher for undergraduates from low income families. That emotional support has even more of an impact on low-income student's persistence than family financial support. Roksa and Kinsley (2019) concluded that their "findings have valuable implications for research on student success in higher education...reveal[ing] the importance of considering family support as an important contributor to academic success of low-income students" (p. 431).

Theoretical Framework

Given the importance of engagement and community, we grounded this study in Vygotsky's theory of the Zone of Proximal Development, Borup et al.'s Academic Communities of Engagement framework, and Garrison et al.'s (2000) Community of Inquiry framework. We briefly discuss each below.

Vygotsky's Zone of Proximal Development theory provided the groundwork for understanding how learning is impacted by the support of others. Vygotsky (1978) proposed that

each learner has a level of achievement that is possible independently and another level of achievement that is possible with outside support (e.g., with the help of a teacher or instructional scaffolding). He defined the Zone of Proximal Development (ZPD) as "the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (p. 86). In other words, learning happens when a student is challenged to attempt work that is beyond their independent level of skill but that is possible with outside support. That outside support in an online course typically takes the form of course community and personal community.

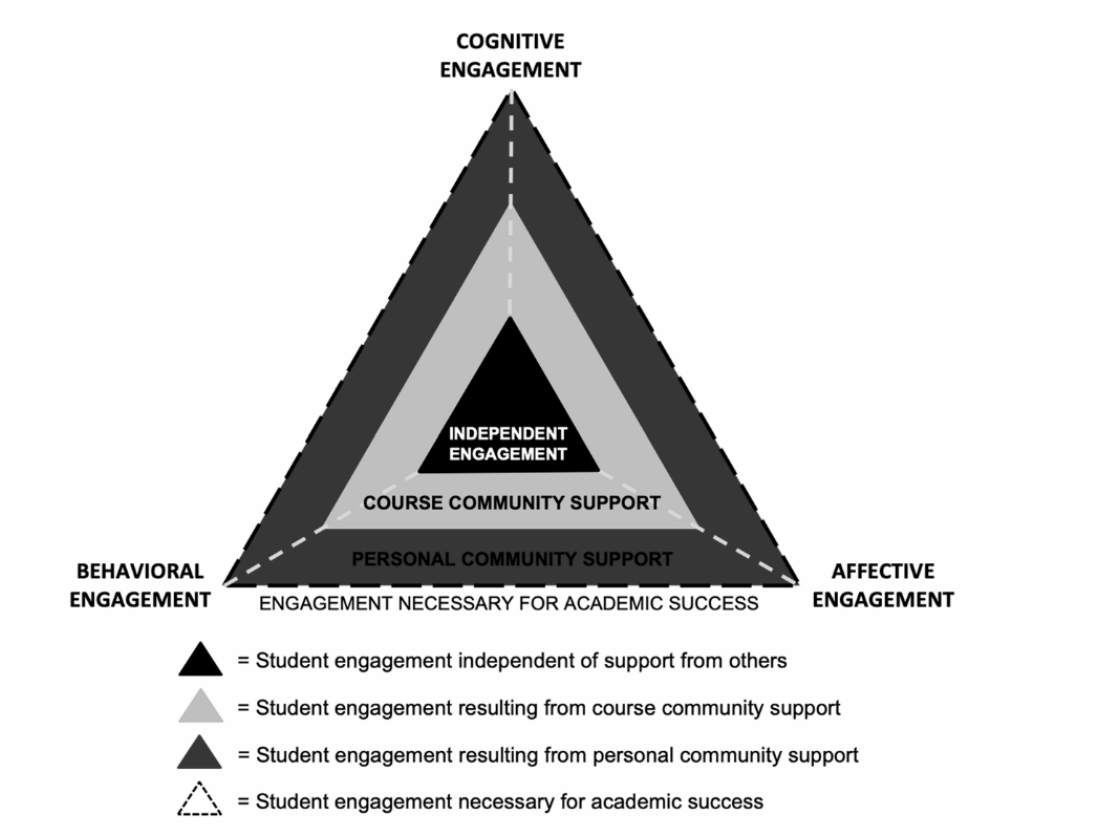
Building from Vygotsky's Zone of Proximal Development, Borup et al. (2020) developed the Academic Communities of Engagement framework. They posited that each student has a level of engagement that they are able to achieve independently. This level of engagement varies depending on the individual learner's motivation, background, and characteristics. The level of independent engagement can vary for an individual from course to course or even from activity to activity due to a learner's motivation, interest in a particular topic, or connection to a particular instructional strategy (Borup et al., 2020). For Borup et al. (2020), that level of independent engagement can be influenced by outside support from a course community and a personal community.

Influenced by Vygotsky, Borup et al. (2020) believed that learning is influenced by outside support (see Figure 1). Figure 1 illustrates that students can only reach a certain level of engagement independently. Their level of engagement and in turn academic success can increase with course community support or personal community support, but it cannot be maximized without some form of outside support. Thus, a student's level of independent engagement is not

sufficient for them to achieve academic success. Only through the addition of personal community or course community can the student reach the required level of engagement for academic success (Borup et al., 2020).

Figure 1

Independent engagement supported by the course community and personal community (Borup et al., 2020)



Borup et al. (2020) argued that the Community of Inquiry framework (CoI) developed by Garrison et al. (2000) was too narrow, accounting only for interactions that happened within a course and ignoring how interactions that happen outside of a course may impact learning. They argued that "we need better theoretical frameworks that explain the role and interaction of important supplemental relationships and personal communities (e.g., families and friends) that support students' engagement in online and blended learning" (Borup et al., 2020, p. 2). Borup et

al. (2020) developed the Academic Communities of Engagement (ACE) framework as a way to look at community engagement in a broader sense. We contend that the ACE and the CoI frameworks are not mutually exclusive but could possibly work well together. The CoI framework provides a way to think about what happens within an online course through the interaction of teaching presence, social presence, and cognitive presence in the development of a community of inquiry. The ACE framework provides a way to conceptualize how community support (in part, we posit, through teaching presence, social presence, and cognitive presence) and personal support (i.e., family and friends) help students learn and do more than they could relying on their own individual engagement (which as mentioned earlier is influenced by things such as an individual learner's motivation, background, and characteristics). To be clear, we do not simply see elements of the ACE framework aligning exactly with the CoI framework. In other words, we do not see cognitive engagement being just another name for cognitive presence. Rather different presences in the CoI help in part develop different types of engagement identified in the ACE framework. For instance, supporting elements of affective engagement, according to Borup et al., include things such as facilitating communication, developing relationships, and instilling excitement for learning. The CoI theorizes that facilitating communication is a key part of teaching presence (see Anderson et al., 2001) and that developing relationships (i.e., through interaction and group cohesion) is an aspect of social presence (see Rourke et al., 1999), thus suggesting that teaching and social presence can help develop affective engagement. In much the same way, aspects of teaching presence, social presence, and cognitive presence could be seen as ways to help develop cognitive engagement.

In this study, course community was conceptualized as a function of a CoI, which results from the development and interaction of teaching presence, social presence, and cognitive

presence (Garrison et al., 2000). A course community is reliant on all three presences existing in a course. Course community does not happen automatically just as not all online courses are true Communities of Inquiry. Only through the interaction of teaching presence, social presence, and cognitive presence is course community possible. This aligns with Borup et al.'s (2020) definition of course community: "The course community is organized and facilitated by those associated with the course or program who have knowledge of course content, expectations, and procedures" (p. 11). Though the Borup et al. (2020) definition focuses on teaching presence and how a student learns about the expectations of the course, their identification of "building relationships" and "encouraging progress" as key elements of support demonstrate their recognition that a course community also involves cognitive presence and social presence (p. 12). Thus, we see these two frameworks as complementary; one helps illustrate how course community support and personal support influence engagement and the other helps illustrate and conceptualize how community support emerges in online courses.

Each of these frameworks provides an important element to the design of this study. From Vygotsky (1978), we gain an understanding of the importance of outside support in order to reach deeper levels of learning. From Borup et al. (2020), we gain an understanding of the importance of outside support on learner engagement, especially in online courses. Finally, from Garrison et al. (2000), we gain a deeper understanding of what it means to have a course community built through the elements of a CoI.

Methods

The focus of this study was on how course community support and personal community support influence learner engagement. More specifically, we sought to answer the following research question in this quantitative exploratory study: To what extent do course community

and personal community explain variations in learner engagement in online courses? We created a survey from three existing surveys. Results from the surveys were validated and analyzed using multiple regression to explore to what extent course community support and personal community support account for variance in learner engagement.

Context of the Study

The setting for this study was a small art and design school located in the western U.S. with annual enrollments of 1800 students. Students were invited to participate in the study after completion of one online course in the Liberal Arts department. Liberal Arts was specifically chosen for the sample because students in all majors take courses within Liberal Arts, providing a more diverse sample within a specialized university. Courses at the participating university are offered on 8-week terms. Students completed the survey within two weeks of completing the term. The sample size for the study was 74 undergraduates, with a response rate of 16%. Participants in the study were entered in a drawing for one of four $25 gift cards if they chose to provide an email address.

Data Collection

We created an online survey consisting of demographic questions as well as questions from the following three established instruments: the Online Student Engagement Scale (OSES) (Dixson, 2010), the Community of Inquiry instrument (Arbaugh et al., 2008), and the Medical Outcomes Social Support Survey (MOS-SSS) (Sherbourne & Stewart, 1991) (see Table 1). The dependent variable in this study was learner engagement within an online course; the independent variables were level of course community support and personal community support experienced by a learner. We used the OSES (Dixson, 2015) to measure the dependent variable. The OSES was selected because Borup et al. (2020) and Dixson (2015) defined engagement in

similar ways; both emphasized the importance of student energy expended in the pursuit of learning. The OSES measures that energy by asking participants to quantify how "characteristic" a set of statements is for them as they reflect on their experience in a course. Statements like "putting forth effort" and "helping fellow students," evaluated on a Likert scale, gauge how much energy the student put into the learning experience and, thus, their overall engagement (Dixson, 2015). We then used the Community of Inquiry (CoI) questionnaire to measure course community. This instrument has three underlying factors: social presence, cognitive presence, and teaching presence. The CoI Instrument is widely used to explore qualities of online learning communities and shows strong reliability and validity (Akyol & Garrison, 2011; Arbaugh et al., 2008; Shea & Bidgerano, 2010). Finally, we used the MOS Survey (MOS-SSS) (Sherbourne & Stewart, 1991) to measure the level of personal community. This survey asks participants to evaluate how often they have support and interactions within their personal community (Moser et al., 2012). Personal community includes an individual's support system outside of a classroom including friends, family, and community members. Though the MOS Survey (MOS-SSS) was originally designed to measure personal community related to healthcare, minor modifications made it an appropriate measure for personal community in any setting.

Table 1
Survey Details

Elements within the Research Question	Existing Survey	Variable Types and Description	# of survey questions
Learner Engagement	Dixson (2015) Online Student Engagement Scale Complete questionnaire in Appendix A.	Dependent variable Continuous 1-5 Likert scale from not at all characteristic of me to very characteristic of me	19
Course Community Support	Arbaugh et al. (2008) CoI Instrument Complete questionnaire in Appendix B.	Independent variable Continuous 1-5 Likert scale from strongly disagree to strongly agree	34
Personal Community Support	MOSSsurvey (Sherbourne & Stewart, 1991)--4 items omitted that specifically refer to medical needs Complete questionnaire in Appendix C.	Independent variable Continuous 1-5 Likert scale from not at all often to very often	15

Data Analysis

Survey results were used to construct a stepwise multiple regression analysis that attempted to explain variance in learner engagement based on course community support and personal community support while controlling for confounding variables. Variables were added to the stepwise regression model in a logical order based on correlations and existing research findings on which variables had the most potential to impact learner engagement (Keith, 2019). As a stepwise multiple regression model, variables were only added to the model if they

improved the model's ability to predict learner engagement. Thus, the final multiple regression model does not include all potential variables.

Results

The purpose of this study was to explore to what extent classroom community and personal community can explain variations in learner engagement. Initial analysis focused on ensuring the normality of the data and calculating correlations between each of the variables: learner engagement, classroom community, and personal community as well as demographic data that was captured in the survey including age, gender, parental level of education, high school grades, and previous experience in online courses. Follow-up multiple regression analysis was completed to construct a model that could explain variations in learner engagement based on classroom community and personal community.

Demographics

The survey results were anonymous; thus, only limited demographic data was collected. Thirty six percent of the participants were 18-25 years old, 36% were 26-35 years old, and 26% were above 36 years old. 16 participants were male and 53 were female with 2 respondents identifying as nonbinary. Male participants are somewhat underrepresented in the sample since the participating university's population has 37% male enrollment, but males were only 22.5% of this sample. 85.9% of the participants had taken 4 or more online courses. The participating university allowed students to move between courses on campus and online as needed. Thus, the population was very experienced in taking online courses. Participant's high school grades were normally distributed with 38% reporting earning mostly A's, 39.4% reporting earning mostly B's, and 22.5% reporting earning mostly C's or D's. None of the correlations were statistically significant at the 0.05 level between the control variables and learner engagement.

Correlations were calculated between the control variables and each of the independent variables, course community and personal community. This is to test for collinearity among the variables, meaning that one or more of the independent variables has a high correlation to another independent variable. Collinearity is undesirable because collinear variables share some of the variance in the dependent variable, leading to an overestimate in the power of a model that includes collinearity. In multiple regression analysis, multicollinearity can lead to large standard errors and unclear interpretations (Keith, 2019). Table 2 contains the correlations between course community, personal community, and the control variables. Course community showed a statistically significant relationship with parental level of education, $r(65)=0.28$, $p<0.05$, but no other variables were statistically significant at the 0.05 level.

Table 2

Correlations between Course Community, Personal Community, and Control Variables

		Course Community	Personal Community	Age	Gender	Online course exp.	Average parental education
Course Community	Pearson Correlation	1	.274*	.005	-.003	-.025	.281*
	Sig. (2-tailed)		.026	.966	.982	.839	.023
	N	67	66	67	67	67	65
Personal Community	Pearson Correlation	.274*	1	-.158	.134	-.014	-.080
	Sig. (2-tailed)	.026		.192	.268	.908	.519
	N	66	70	70	70	70	68
Age	Pearson Correlation	.005	-.158	1	-.039	.180	-.139
	Sig. (2-tailed)	.966	.192		.749	.134	.253
	N	67	70	71	71	71	69
Gender	Pearson Correlation	-.003	.134	-.039	1	-.098	-.029
	Sig. (2-tailed)	.982	.268	.749		.415	.812
	N	67	70	71	71	71	69
Online course Exp.	Pearson Correlation	-.025	-.014	.180	-.098	1	.044
	Sig. (2-tailed)	.839	.908	.134	.415		.722
	N	67	70	71	71	71	69

Average of parental education	Pearson Correlation	.281	-.080	-.139	-.029	.044	1
	Sig. (2-tailed)	.023	.519	.253	.812	.722	
	N	65	68	69	69	69	69

*Correlation is significant at the 0.05 level (2-tailed)

Correlations were calculated between the dependent variable in the study, learner engagement, and the independent variables in the study: course community and personal community. Table 3 includes these correlations. The strongest correlation was between learner engagement and course community, $r(66)=0.61$, $p<0.01$. This was followed by a correlation between learner engagement and personal community, $r(69)= 0.37$, $p<0.01$. Both findings provide support for the impact of course community and personal community on learner engagement in online courses

Table 3

Correlations between Learner Engagement, Course Community, and Personal Community

		Course Community	Personal Community	Learner Engagement
Course Community	Pearson Correlation	1	.274*	.610**
	Sig. (2-tailed)		.026	.000
	N	67	66	66
Personal Community	Pearson Correlation	.274*	1	.367**
	Sig. (2-tailed)	.026		.002
	N	66	70	69
Learner Engagement	Pearson Correlation	.610**	.367**	1
	Sig. (2-tailed)	.000	.002	
	N	66	69	70

*. Correlation is significant at the 0.05 level (2-tailed)
**. Correlation is significant at the 0.01 level (2-tailed)

As noted, there was also a correlation between personal community and course community, $r(65)=0.28$, $p<0.05$. The correlation is relatively small but warranted an investigation into multicollinearity to validate the assumptions of multiple regression. Table 5, which reports the larger multiple regression analysis, includes collinearity statistics. Personal

community and course community demonstrated a tolerance of 0.91, indicating independence of the variables. They also demonstrated a VIF of 1.1, providing additional support for their independence (Keith, 2019).

Because the CoI instrument includes sub-scales of Teaching Presence, Cognitive Presence, and Social Presence, additional correlations were calculated between learner engagement and each of these underlying factors. There were statistically significant correlations between learner engagement and each of the sub-factors of the CoI instrument at the 0.01 level with cognitive presence demonstrating the highest correlation, $r(68)=0.67$, $p<0.01$, followed by social presence, $r(69)=0.62$, $p<0.01$, and then teaching presence, $r(69)=0.45$, $p<0.01$.

There were also statistically significant correlations between the subfactors, cognitive presence, social presence, and teaching presence, indicating a potential problem with multicollinearity if the subfactors were used independently in a multiple regression analysis. Because of this multicollinearity, the multiple regression analysis used only the overall measure of CoI with the factors averaged together rather than separating the subfactors into individual variables. Including the entire instrument as one measure eliminates the problem of multicollinearity between the subfactors (Keith, 2019).

Regression Analysis

The goal of multiple regression analysis is to construct a model with as few variables as possible that explains as much of the variance in the dependent variable, learner engagement, as possible (Keith, 2019). A parsimonious model provides more accurate results and clearer interpretations. There were ten different variables that were considered as possible inputs as predictors of learner engagement: course community (combination of teaching presence, cognitive presence, and social presence), personal community, teaching presence (subfactor of

course community), cognitive presence (subfactor of course community), social presence (subfactor of course community), gender, age, parental level of education, high school grades, and previous experience with online courses.

All of the variables considered for inclusion in the multiple regression model can be seen in Table.4, including a description and rationale for including or excluding each variable for consideration in the stepwise multiple regression analysis.

Table 4

Summary of Variables for Multiple Regression Analysis

Variable	Description	Included as a Potential Variable in Stepwise Regression	Rationale
Learner Engagement	Measure of learner engagement, calculated from responses on Dixson's (2015) Online Student Engagement Scale	Yes	Dependent variable
Course Community	Measure of course community, calculated from the CoI Instrument (Arbaugh et al., 2008)	Yes	Demonstrates a correlation with learner engagement and is a core part of the study's research question, eliminates problems of multicollinearity by combining all subfactors of the CoI instrument
Teaching Presence	Subfactor of the CoI Instrument (Arbaugh et al., 2008)	No	Demonstrated multicollinearity with social presence and cognitive presence
Social Presence	Subfactor of the CoI Instrument (Arbaugh et al., 2008)	No	Demonstrated multicollinearity with teaching presence and cognitive presence
Cognitive Presence	Subfactor of the CoI Instrument (Arbaugh et al., 2008)	No	Demonstrated multicollinearity with social presence and teaching presence

Personal Community	Measure of personal community, calculated from the MOS Survey (Sherbourne & Stewart, 1991)	Yes	Demonstrated a correlation with learner engagement and is a core part of the study's research question
Age	Participant's age	Yes	Control variable
Gender	Participant's gender	Yes	Control variable
Experience in online courses	Participant's level of experience with online coursework	Yes	Control variable
High school grades	Participant's self-reported grades from high school	Yes	Control variable
Parental level of education	Participant's parental level of education, created from combining father and mother's level of education	Yes	Control variable

Full Prediction Model

Each of the variables above were entered into the analysis as a stepwise multiple regression. This is an appropriate method when the purpose is to "determine the extent of the influence of one or more variables on some outcome," as it is in this study but only if the order of the variables is thoughtfully determined (Keith, 2019, p. 80). Variables were added to the analysis in the order shown in Table 1.4, eliminating the subfactors of the CoI instrument due to multicollinearity. As explained by Keith (2019), the order of inclusion for variables in a stepwise analysis has an enormous impact on the results of the multiple regression analysis. Variables should be entered in a logical fashion based on existing research about the variables and their potential to impact the dependent variable. In this case, the order was selected based on the likelihood of an individual variable's impact on learner engagement, as evaluated in the correlations explained above and in existing research. Variables were entered into the model in

the same order as identified in Table 4 with the subfactors of the CoI omitted. The results of this stepwise regression analysis can be seen in Table 5.

Table 5

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Course Community		Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >=.100)
2	Personal Community		Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).

a. Dependent Variable: Learner Engagement

Table 6

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.598[a]	.358	.347	.56014
2	.640[b]	.409	.390	.54156

a. Predictors: (Constant), Course Community
b. Predictors: (Constant), Course Community, Personal Community

Table 7

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10.660	1	10.660	33.975	.000[b]
	Residual	19.139	61	.314		
	Total	29.799	62			
2	Regression	12.202	2	6.101	20.803	.000[c]
	Residual	17.597	60	.293		
	Total	29.799	62			

a. Dependent Variable: Learning Engagement
b. Predictors: (Constant), Course Community
c. Predictors: (Constant), Course Community, Personal Community

Table 8

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.079	.202		5.350	.000
	Course Community	.537	.092	.598	5.829	.000
2	(Constant)	.894	.211		4.236	.000
	Course Community	.467	.094	.520	4.960	.000
	Personal Community	.147	.064	.240	2.293	.025

a. Dependent Variable: Learning Engagement

There were two models that were created in stepwise fashion before it was determined that the addition of any more variables would not improve the power of the model. The first model included only course community as a predictor of learner engagement. This model was able to account for 35.8% of the variance in learner engagement ($F(1, 61)= 33.975$, $p<0.001$, $R2=0.358$).

The second model included course community and personal community as predictors of learner engagement. In this model, Course Community and Personal Community were able to explain 40.9% of the variance in learner engagement ($F(2, 60)=20.803$, $p<0.01$, $R2=0.409$). In this model, both personal community and course community were statistically significant predictors of learner engagement and thus were included in the multiple regression model. Course community was more significant with a standardized coefficient of 0.52, compared to a standardized coefficient of 0.24 for personal community. This means that, though both predictors are important in explaining variations in learner engagement, course community had almost twice the impact on learner engagement as personal community.

All other variables were excluded from the final multiple regression model because they did not meet the stepwise regression rule for entry, meaning that they did not improve the model

by F=0.05 or more.

Discussion

Analysis and Implications

The research question in this study was: To what extent do course community and personal community explain variations in learner engagement in online courses? A multiple regression analysis of learner engagement with personal community and course community as independent variables was able to account for 40.9% of the variance in online learner engagement with course community having more than twice the influence as personal community on learner engagement. Keith (2019) stated that, within education research, a model that accounts for more than 20% of the variance in a variable is a significant finding since 20% represents approximately one year of student growth. Education research is prone to confounding variables and thus multiple regression analysis that identifies more than 20% of the variance in a dependent variable is rare (Keith, 2019). Being able to account for 40.9% of the variance in learner engagement with just personal community and course community as variables is a significant finding with important implications for both research and practice.

CoI and Engagement

An important finding within these results is how different factors in the CoI correlated with learner engagement. Research by Young and Bruce (2011) and Conrad (2005) indicated that instructors have a significant impact on engagement. In this study, teaching presence was not any more significant in learner engagement than any other element of the CoI framework. Learner engagement had a moderate correlation with each element of the CoI framework with cognitive presence having the highest correlation, $r(68)=0.67$, $p<0.01$, and teaching presence having the lowest correlation, $r(69)=0.45$, $p<0.01$. This finding suggests that all elements of the CoI

framework have an important role in learner engagement. In order to increase engagement, an instructor or course designer cannot focus just on social presence or just on cognitive presence. It is the combination of all three factors that encourages engagement. This affirms Garrison and Arbaugh's (2007) assertion that the CoI framework should be studied comprehensively when possible, rather than trying to isolate any individual factor of the model. It is the combination of factors that best encourages engagement.

Influence of Course Community on Engagement

The multiple regression model in this study indicated that course community, as measured by the CoI instrument, can explain 35% of the variation in learner engagement in an online learning experience (Arbaugh et al., 2008). This finding supports the validity of the CoI framework as a predictor of learner engagement (Garrison et al., 2000).

Borup et al. (2020) called out the CoI framework as being insufficient to explain variations in learner engagement. They indicated that researchers "need better theoretical frameworks that explain the role and interaction of important supplemental relationships and personal communities (e.g., families and friends) that support students' engagement in online and blended learning" (Borup et al., 2020, p. 2). The results of this study indicate that both the Academic Communities of Engagement model and the CoI framework have important contributions to make in understanding engagement in online learning (Borup et al, 2020; Garrison, et al., 2000). Both models have significant explanatory power in understanding variations in learner engagement.

Influence of Personal Community on Engagement

In this study's multiple regression model, personal community accounted for about five percent of the variance in learner engagement with course community accounting for the other

35%. While five percent is a modest result, it does provide support for the assertion that a student's support outside the classroom will directly impact their ability to engage inside the classroom. This finding lends support for Borup et al.'s (2020) Academic Communities of Engagement model, which proposes that to fully understand engagement, researchers and practitioners must consider the impact of personal community on engagement in addition to course community.

Course Community, Personal Community, and their Combined Influence on Engagement

In the multiple regression model in this study, the combination of course community and personal community was able to account for 40.9% of the variance in learner engagement. The fact that both variables were statistically significant provides support for Borup et al.'s (2020) assertion in the Academic Communities of Engagement framework that both personal community and course community influence learner engagement. To focus on just one element or the other would be insufficient. Instructors, course designers, and university support staff will need to focus on developing a learner's sense of course community and personal community in order to increase student engagement in online courses. Rather than a singular focus on any one factor (i.e., course community, personal community, or any single element of the CoI framework), the findings of this study suggest that a combination of these factors can improve engagement.

While the stated purpose of this study was to help simplify engagement frameworks and identify what elements can best explain variations in engagement, the end result did not do that. It indicated that practitioners who want to focus on increasing learner engagement should focus on both personal community and course community. In this instance, Borup et al.'s (2020)

Academic Community of Engagement framework provides a good way to envision how the factors can interact to promote engagement.

Conclusion

Limitations

Like all research, there are a few limitations to this study. First, in the absence of a developed instrument to measure the ACE framework, we chose the Online Student Engagement Scale (OSES) (Dixson, 2010) to measure engagement, the Community of Inquiry instrument (Arbaugh et al., 2008) to measure classroom community, and the Medical Outcomes Social Support Survey (MOS-SSS) (Sherbourne & Stewart, 1991) to measure personal community. While we identified a high level of face validity between these instruments and the different aspects of the ACE framework, none of them were specifically created as an instrument to measure the different components individually or collectively of the ACE framework. Second, the sample in this study was students attending an arts and design school. Thus, the survey results should be interpreted with caution. They may not generalize to schools in other fields. Third, this study took place during the COVID-19 crisis and under social distancing measures; the results may be impacted by student isolation, especially from their personal community. The impact of personal community during a quarantine may be more or less significant than during a normal semester.

Recommendations for Future Research

The results of this study indicate several areas of exploration for future research initiatives. One is that more research is needed into elements of personal community and how they interact with learner engagement. Since personal community demonstrates potential as a predictor of learner engagement, future studies should look at what specific elements of a

personal community are most impactful for learners. Another is that the ACE framework does not explicitly focus on the impact that one's program, department, school, or institution could have in providing additional layers of community support that can support engagement in ways that course community and personal community might not.

An additional area of future research would be to focus on elements of the CoI framework and their impact on learner engagement. While this study demonstrated a relatively equal impact on learner engagement from social presence, teaching presence, and cognitive presence, that finding should be explored with a larger population. While the impact of each CoI element was relatively equal at an art school, their relative importance could be different in a broader population.

Finally, this study accounted for 40% of the variance in learner engagement. Additional research should seek to explore the other 60% and what additional factors within an online learning experience impact engagement.

Implications of the Results

The results of this study have several key implications with importance for instructors, instructional designers, and university support staff. For instructors, this study indicates the importance of both course community and personal community within online learning. It is worth an instructor's time to find ways to build a sense of community within their course. The result should be greater learner engagement. Because personal community helps to explain variations in learner engagement, instructors should also consider finding ways to identify students who lack support outside the classroom. Understanding that a student does not have a sense of personal community could be a powerful way to identify learners who are at-risk for low engagement in a class. In this case, the modified MOS-SSS (Sherbourne & Stewart, 1991),

found in Appendix C and used in this study, could be used to assess a student's sense of personal community at the beginning of a course or when enrolling in a university to better target student support services known to influence a student's sense of personal community.

For instructional designers, this study indicates the importance of course designs that emphasize building community. Discussions, group projects, and back-channel communications all demonstrate potential in building a sense of course community through course design (O'Shea, Stone, & Delahunty, 2015; Price & Tovar, 2014; Zhu, 2006; Zydney, deNoyelles, & Seo, 2012). Designers should prioritize these instructional strategies as a way to increase learner engagement.

Designers and instructors should also consider incorporating assignments that have the potential to build a student's personal community. For instance, volunteering in the community as an assignment has potential as a learning activity and as a way to build personal community. Brail (2016) found that students who participated in this sort of service learning earned higher course grades. The current study would indicate that those who participate in service learning may also have higher levels of personal community and thus stronger engagement.

For university support staff, especially student affairs, this study indicates the importance of community building activities on campus. Mixers, social events, student clubs, student mentors, and any other event that helps students make friends could increase learner engagement. The findings of this study support these efforts as not just a frivolous addition to the academic experience but as an integral part of encouraging a learning environment. University support staff should also be aware that students who lack a personal community are at-risk for lower engagement in their courses. Support staff can work to identify these at-risk students and

implement interventions for them, including counseling, advising, and proactive connections with other students (Kot, 2014; Lee et al., 2009).

The results of this study indicate the critical importance of community in the learning process. Both personal community and course community are significant predictors of learner engagement and, thus, should be considered key elements in the learning process. The results indicate that a focus on community-building is a core instructional strategy in encouraging learner engagement.

Declarations

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APPENDIX A

Questions from the Online Student Engagement Scale (Dixson, 2010) Learner Engagement: Online Student Engagement Scale--dependent variable

Within that course, how well do the following behaviors, thoughts, and feelings describe you?

Please answer using the following scale:

1. not at all characteristic of me

2. not really characteristic of me

3. moderately characteristic of me

4. characteristic of me

5. very characteristic of me

1. Making sure to study on a regular basis
2. Putting forth effort
3. Staying up on the readings
4. Looking over class notes between getting online to make sure I understand the material
5. Being organized
6. Taking good notes over readings, PowerPoints, or video lectures
7. Listening/reading carefully
8. Finding ways to make the course material relevant to my life
9. Applying course material to my life
10. Finding ways to make the course interesting to me
11. Really desiring to learn the material
12. Having fun in online chats, discussions or via email with the instructor or other students

13. Participating actively in small-group discussion forums

14. Helping fellow students

15. Getting a good grade

16. Doing well on the tests/quizzes

17. Engaging in conversations online (chat, discussions, email)

18. Posting in the discussion forum regularly

19. Getting to know other students in the class

APPENDIX B

Questions from the Community of Inquiry Instrument (Arbaugh et al., 2008)

Course Community Support: Community of Inquiry Instrument--independent variable

Please answer using the following scale:

1. Strongly disagree

2. Disagree

3. Neither agree or disagree

4. Agree

5. Strongly agree

Teaching Presence

1.The instructor clearly communicated important course topics.

2. The instructor clearly communicated important course goals.

3. The instructor provided clear instructions on how to participate in course learning activities.

4. The instructor clearly communicated important due dates/time frames for learning activities.

5. The instructor was helpful in identifying areas of agreement and disagreement on course topics that helped me to learn.

6. The instructor was helpful in guiding the class towards understanding course topics in a way that helped me clarify my thinking.

7. The instructor helped to keep course participants engaged and participating in productive dialogue.

8. The instructor helped keep the course participants on task in a way that helped me to learn.

9. The instructor encouraged course participants to explore new concepts in this course.

10. Instructor actions reinforced the development of a sense of community among course participants.

11. The instructor helped to focus discussion on relevant issues in a way that helped me to learn.

12. The instructor provided feedback that helped me understand my strengths and weaknesses relative to the course's goals and objectives.

13. The instructor provided feedback in a timely fashion.

Social presence

14. Getting to know other course participants gave me a sense of belonging in the course.

15. I was able to form distinct impressions of some course participants

16. Online or web-based communication is an excellent medium for social interaction.

17. I felt comfortable conversing through the online medium.

18. I felt comfortable participating in the course discussions.

19. I felt comfortable interacting with other course participants.

20. I felt comfortable disagreeing with other course participants while still maintaining a sense of trust.

21. I felt that my point of view was acknowledged by other course participants.

22. Online discussions help me to develop a sense of collaboration.

Cognitive presence

23. Problems posed increased my interest in course issues.

24. Course activities piqued my curiosity.

25. I felt motivated to explore content related questions.

26. I utilized a variety of information sources to explore problems posed in this course.

27. Brainstorming and finding relevant information helped me resolve content related questions.

28. Online discussions were valuable in helping me appreciate different perspectives.

29. Combining new information helped me answer questions raised in course activities.

30. Learning activities helped me construct explanations/solutions.

31. Reflection on course content and discussions helped me understand fundamental concepts in this class.

32. I can describe ways to test and apply the knowledge created in this course.

33. I have developed solutions to course problems that can be applied in practice.

34. I can apply the knowledge created in this course to my work or other non-class related activities.

APPENDIX C

Questions from the Medical Outcomes Social Support Survey (Sherbourne & Stewart, 1991) Modified from Sherbourne and Stewart (1991)

Please answer using the following scale:

1. None of the time

2. A little of the time

3. Some of the time

4. Most of the time

5. All of the time

Omitted Items: Items 1-4 omitted because they focus on physical health exclusively

If you needed it, how often is someone available.

Item 1 to help you if you were confined to bed?

Item 2 to take you to the doctor if you need it?

Item 3 to prepare your meals if you are unable to do it yourself?

Item 4 to help with daily chores if you were sick?

Included Items

If you needed it, how often is someone available.

Item 5 to have a good time with?

Item 6 to turn to for suggestions about how to deal with a personal problem?

Item 7 who understands your problems?

Item 8 to love and make you feel wanted?

Item 9 you can count on to listen to you when you need to talk?

Item 10 to give you good advice about a crisis?

Item 11 who shows you love and affection?

Item 12 to give you information to help you understand a situation?

Item 13 to confide in or talk to about yourself or your problems?

Item 14 who hugs you?

Item 15 to get together with for relaxation?

Item 16 whose advice you really want?

Item 17 to do things with to help you get your mind off things?

Item 18 to share your most private worries and fears with?

Item 19 to do something enjoyable with?