

Different Perceptions of Classroom Settings

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Abstract

As a result of COVID-19, many university students and instructors have been faced with an entirely new learning format on online platforms such as Zoom. Past research has investigated how online learning affects student connection and engagement, but very little research has been conducted on these topics in relation to Zoom (synchronous online learning), which was a predominant form of online classroom during the pandemic. In this study, college students completed an online survey meant to determine if students felt there was a difference in their ability to engage and connect in online class settings versus in-person settings. We predicted that there would be a positive relationship between connection and engagement, and that students would report feeling less engaged and less connection to their classmates, instructors, and course material in their online classes. Results revealed correlations between all three forms of perceived connection (to classmates, instructor, and course material) and perceived engagement to their class in general, but a Linear Mixed Model Analysis failed to support a main effect of format on engagement or an interaction between format and connection. These findings suggest that connection may be a more important factor than classroom format in determining student engagement than classroom format, providing evidence that increasing perceptions of connection should lead to a more engaged classroom, regardless of format. Despite limitations, these results provide a basis for future researchers to better investigate the efficacy of synchronous online learning. Due to Covid-19 mask restrictions in in-person classes during the course of this study, further research should attempt to replicate these findings in a more traditional class setting, without masks.

Introduction

In 2020, the rapid spread of coronavirus disease 2019 (COVID-19) resulted in lockdowns and quarantine measures across the globe. The consequences of this pandemic were seen in many aspects of society, and the impact on the educational sector was especially significant. Schools were forced to close their doors and cease in-person instruction, switching unexpectedly to an entirely online classroom. In addition to the fear and uncertainty involved in living through a pandemic, students and educators were also faced with a learning format unfamiliar to many of them. One method of online learning that was commonly employed by universities involved synchronous face-to-face instruction on platforms such as Zoom. This format provided live audio-visual instruction in which students are present while the class is being taught. This allows for discussion and interaction between the instructor and the students as well as between the students¹. Such synchronous online learning provides the closest experience to in-person instruction while still being online, and it allows for aspects of a live classroom that would otherwise be impossible, such as interacting with the instructor and other students in real-time. Various forms of online learning, including asynchronous audio-visual instruction and interactive digital content, have been the subject of extensive research. However, due to the relatively new nature of synchronous platforms such as Zoom to university students, there has been very little research concerning this type of online instruction.

Literature on traditional in-person learning formats has indicated that connection and feelings of relatedness to teachers and peers may be important for students' academic experience and performance^{2,3}. Connection and relatedness are terms often used interchangeably, and usually defined as the ability to relate, trust, and rely on others. For example, research suggests that students' interactions with their teachers and peers has a positive impact

on motivation and learning⁴. Furthermore, there is evidence that student-teacher connection impacts student-peer connection². However, there is limited research available on how these kinds of connection operate in the online format. Those that do exist suggest that online educational settings may pose hurdles for students in terms of connection. For example, students have reported the need for more social connection in online learning settings in order to assist in both emotional support and learning³, suggesting that some students feel there is a lack of such connection online. Work by Jaber and Kennedy has suggested that social presence and trustworthy communication play an important role in students' learning experience, and that with the absence of being physically present in a classroom this interaction inevitably functions differently online⁵.

Additional research suggests that there are a few routes of connection within the online classroom. Lapointe and Reisetter suggest that connection with the instructor, specifically, is essential and one of the most important predictors of the success of online learning⁶. However, results were mixed regarding peer-to-peer interactions. In Lapointe and Reisetter's study, many students felt that a social community of classmates was beneficial to their learning (online or otherwise). However, other students perceived an added social element to online learning was unhelpful or even detrimental to their learning process. This finding is of added interest considering the previously mentioned research on in-person classrooms indicated the social environment with classmates is important for learning and may also strengthen connections with the instructor^{2,3}. It is possible that Lapointe and Reisetter's mixed results may stem from the fact that there are many forms in which online learning may take. However, it cannot be denied that the environment of online education, despite the form it takes, all differs from the social environment of the traditional classroom. These mixed results demonstrate the necessity of more research on connection in online learning environments. Engagement is another factor in the classroom that is important for learning outcomes^{7,8}. Student engagement is broadly understood as students being actively involved in or committed to learning in the classroom. Evidence suggests that students who feel more engaged in the classroom have more motivation to learn⁹. Despite the quantity of literature on the importance of engagement in education, there are only a few which study this relationship in online settings. One such study has indicated a link between feelings of engagement in the classroom and the social presence (connection) discussed earlier. For example, a recent study examined the impact of social networking in online courses on the engagement and learning outcomes of high school students¹⁰. Results suggested that social connection helped support self-regulated learning, and that the amount of social interaction was positively correlated with the level of academic engagement. However, these researchers found that more is not always better, and that optimal student engagement was found in subgroups of five, suggesting five is the optimal connection size. Another recent study examined how faculty and graduate students perceived engagement in their online graduate courses¹¹. Both the students and the faculty indicated that they felt the social presence element of communication to be an important determinant of engagement in online classes. Specifically, greater student-student connection and student-instructor connection led to more engagement in the online classroom. While the online platform used in this study was not the synchronous face-to-face format that became omnipresent during COVID-19, researchers still found that using technology to create an audio and/or visual presence made the instructor seem more real and approachable online, leading to more meaningful interactions.

There is also evidence that social cues are an important part of motivation and learning^{12,13} in traditional classrooms. One study investigating social cues in online classrooms suggested that learning is improved in online classes when students are relayed social cues, such as instructor's face direction and eye gaze, which promote engagement¹⁴. However, the online format of this study was prerecorded instructional videos and not the synchronous face-to-face format that is the focus of the present study. As such, synchronous formats such as Zoom may possess even more potential for fostering social presence, connection, and social cues, leading to increased engagement than might be present in pre-recorded instructional settings. Furthermore, the extent to which these cues differ from in-person to synchronous online classes is not fully known.

Due to the consistent findings that connection and engagement are related to improved learning, as documented in past research, their operation in the sphere of online learning is of interest since online educational practices adopted during the COVID-19 pandemic, while reduced, have not disappeared. Rather, it is likely that many colleges and instructors may continue to use these forms of instruction moving forward. Furthermore, while some research has addressed these factors with respect to an online education, there has been very little research conducted on synchronous online learning, a format that so many educators have used during the COVID-19 pandemic. While it appears that synchronous online learning may replicate certain aspects of in-person learning, there are a number of potential challenges to online instruction, including difficulty with motivation and procrastination¹⁵, and increased potential for student-teacher miscommunication¹⁶ possibly due to the difference in available social cues.

The purpose of this study is to further examine these elements of connection and engagement in the online learning environment, specifically in synchronous formats such as Zoom. To add to the available literature on the subject, we designed a study to assess how students perceive their engagement and their connection to classmates,

instructor, and course material in both their synchronous online and in-person classes. The study was conducted during the time in which many campuses offered both online and in-person classes, allowing for a comparison within students. We hypothesized that although synchronous online instruction is closer to a traditional face-to-face classroom than other online formats, students will still perceive greater engagement and connection in their in-person classes. Furthermore, we predict that there will be a relationship between engagement and all types of connection, regardless of the classroom format.

Method

Participants

Participants ($n = 50$) were college students who completed an online survey as one option for course credit, screening them for eligibility for the study. Participants were deemed eligible if they were 18 years or older and took at least one synchronous online class and one in-person class during the Spring and/or Summer of 2021

Procedure

After completing eligibility screening and informed consent procedures, participants were directed to the survey by the online platform. Participants were asked to specify one synchronous and one in-person class taken during the Spring and/or Summer of 2021 to focus on throughout the survey. They were then asked about their perceptions of connection, engagement, motivation, distraction, and learning experiences for both the online and the in-person class, first separately and then comparatively. A free response section allowed participants a chance to reflect on their experiences of the differences between online and in-person classes in their own words. All questionnaire items were written for the purpose of this study. Following survey completion, participants were debriefed on the research question and thanked for their participation.

Measures

perceived connection

Three types of perceived connection were assessed in this study and were analyzed separately. Perceived connection in each chosen class was measured using the following responses: “I experienced a good connection with my classmates”, “I felt a strong connection to my professor”, and “I felt connected to the material”. Participants indicated agreement with each statement using a 5-point Likert scale ranging from 1- strongly disagree to 5-strongly agree. Participants were also asked to compare their perceived connection with classmates, instructor, and class material between their chosen classes. For each type of perceived connection, participants were asked if they felt there was a difference between their chosen online and in-person classes. If they selected “yes”, they were asked to indicate which class setting they felt a stronger connection in, from 1, being “There was a much stronger connection online” to 6, “There was a much stronger connection in-person

perceived engagement

Engagement for each selected class was measured using an index variable consisting of the following responses: “I felt engaged”, “I felt motivated to complete my assignments”, and “I felt it was easy to pay attention”. All of these statements were highly correlated ($p < .001$). Participants rated their agreement with each statement using the same 5-point Likert scale described above. This index variable was compiled by adding and averaging these responses and used for analysis. No comparative engagement questions were included.

Results

Perceived Connection

Perceptions of connection to course material, classmates, and the professor were assessed separately (see Table 1). Means for each form of connection were higher for in-person classes than for online classes. However, within each classroom format, the pattern of connection means was similar, with connection to course material being the highest

and connection to classmates being the lowest in both cases. Paired samples *t*-tests confirmed that all forms of perceived connection were higher for in-person than online classes (course material $t(48)=5.285, p<.001$; classmates $t(48)=6.921, p<.001$; professor $t(48)=5.285, p<.001$).

Table 1. Perceived connection and engagement for selected in-person and online classes

Variable	Class Format			
	In-Person		Online	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Perceived Connection to Course Material	4.20	.763	3.02	1.286
Perceived Connection to Classmates	3.57	1.041	2.00	1.161
Perceived connection to Professor	4.12	.904	2.94	1.268
Perceived Engagement	4.27	.700	2.62	1.338

Participants were also asked to compare perceived connection between the two class formats. When asked whether they experienced a difference in connection to their classmates, 20.4% (n=10) of participants reported no difference while the remaining, 79.6% (n=39) did report a difference. Connection to course material followed a similar pattern (no difference: 30.6% (n=15) difference: 69.4% (n=34)), while connection to the professor was perceived more equitably between formats (no difference: 40.8% (n=20) difference: 59.2% (n=29)). For those who did report a difference in connection, the majority of participants indicated that they felt a stronger connection in the in-person class, regardless of the type of connection assessed (see Table 2). Paired samples *t*-tests were not performed on the comparison questions due to a low number of participants endorsing better connection in online classes. Table 2. Perceived connection in those who reported a difference between formats

Connection Type	Format of classroom indicated as having a stronger connection	
	Online (<i>n</i>)	In-person (<i>n</i>)
Classmates	15.4% (6)	84.6% (33)
Instructor	13.8% (4)	86.2% (25)
Course Material	17.6% (6)	82.4% (28)

Perceived Engagement

As expected, descriptive analysis of the online and in-person engagement indexes revealed a higher average score for in person classes than for online classes (see Table 1). A paired samples *t*-test confirmed that participants reported more engagement within their in-person than their online class ($t(47)=7.263, p<.001$).

Predictive Model

A Linear Mixed Model Analysis was used to assess whether differences in classroom format and experiences of connection to students, teachers, and course material were related to differences in student engagement. Results suggested no main effect of classroom format on perceived engagement ($p = .891$). Each of the three forms of perceived connection significantly predicted student perceptions of engagement (classmates $t(90)=3.590, p=.001$; professor $t(90)=2.877, p=.005$; course material $t(90)=2.807, p=.006$). These results demonstrate that increased perceptions of connection to classmates, professor, and course material are each related to an increase in perceived classroom engagement. Finally, classroom format was not found to interact with any of the three forms of connection ($p's>.05$), suggesting that the relationship between perceived engagement and connection functions similarly regardless of classroom format.

Discussion

This study examined student perceptions of engagement and connection in online and in-person classes. In general, the descriptive data suggest a difference in how students felt they connected and engaged in the two class settings.

Supporting expectations, results from paired samples *t*-tests suggested that the majority of students seemed to feel a stronger connection to their classmates, professor, and class material in their in-person classes. Additionally, results from comparison questions suggested that most students explicitly believe there is a difference in these types of connection between online and in-person classes, though connection to professor seemed to be least influenced by classroom format. For all types of connection, the majority of students who felt a difference in their ability to connect showed a preference for in-person classes. Engagement followed this trend and revealed higher averages in the engagement index for in-person classes, suggesting that students felt they were more engaged in their in-person classes. In testing the main hypothesis, inferential analysis also suggested no difference in perceived engagement between classroom formats. However, all three forms of connection measured in this study were found to predict perceived engagement. As students perceived more connection to their professor, classmates, and course material, perceptions of engagement also increased, regardless of format.

While these results failed to support our initial prediction that perceptions of engagement would be higher in in-person classes than in online classes, they do have important implications for educational practices. These results indicate that connection is more important than format in terms of fostering engagement in students. If the results from this study accurately reflect the relationship between engagement and connection, it provides us with an insight into improving the experience of online classes for students. Although students seem to report less engagement and less connection in their online classes, this consistent correlation suggests that if instructors can find ways to increase perceived connection in their online classes, students should also feel more engaged. The relationship between the three forms of perceived connection and perceived engagement in this study appear to operate similarly in online classes and in in-person classes, therefore, past strategies used in fostering connection in traditional classrooms may prove useful in online classes as well. More research should be done concerning ways in which connection can be improved in an online setting. This study provides relevant information on connection and engagement, two important components of learning and performance in the classroom^{2,7,9,17}, and adds to the knowledge of the efficacy of online learning.

Although our hypothesis that students would experience more engagement in their in-person classes compared to their online classes was not supported by inferential analysis this may have been due to the answer choices presented in the questions which asked students whether connection was better in person or online. For each of these comparison questions, there was a “no difference” option. We included those who selected “no difference” in the analysis because taking them out would have reduced the sample size by between 20-40%. When looking at the number of students who indicated a difference, a strong majority of them reported greater connection in-person. As a result, the test of main effect may have been masked by including the “no difference” individuals. Further research could strive for larger sample size.

Another limitation of this study derives from conditions and environments required by universities when returning to in-person learning during the COVID-19 pandemic. Prior research^{4,14,18,19} suggests social cues may be an important part of engagement and the promotion of learning in the classroom. Social cues can come from facial expressions, body language, and physical movement. An average in-person classroom pre-pandemic would possess all of these cues (for both instructor and classmates), while an online class setting would typically be limited to facial and upper-body cues only. In this format, students lose access to full-body language and physical movement cues of both instructors and classmates. Additionally, students in online classes may or may not have access to classmate cues at all, depending on students’ decisions to have cameras on or off during class time. In a free response section asking about online classes, one student wrote: “There was not a personal connection, no matter how hard the professor(s) tried. It's hard to create a unified discussion setting when half of the class is just black screens.”, demonstrating the issue of students’ participation with their cameras. This lack of audio-visual communication may prove to be problematic for students’ ability to learn, as research indicates that such communication is an important part of trust necessary for effective online learning⁵.

This study was also conducted during the early stages of universities’ return to in-person classes, when instructors and students were both required to wear masks, limiting access to an important social cue, facial expressions, for in-person classes, specifically. Several participants mentioned this problem in free response questions that were provided for students to share their experiences and give additional details: “Because of covid, we've had to wear masks, so I haven't been able to see people's facial expressions very well when in person”, “wearing masks and sanitizing and social distancing was jarring to get used to at first in the classroom, I couldn't see the profs or classmates expressions and felt like I couldn't talk to or go near classmates because of covid.”, “During the spring 2021 semester, I found it very distracting to watch my teacher with a mask as it was harder to see her facial expressions”. As such, these results can only speak to masked in-person classrooms and may not be representative of perceptions of learning, connection, and engagement in un-masked classrooms. Future researchers should attempt to

replicate this study with un-masked classrooms to ascertain if these results remain consistent once facial cues are available to in-person students.

Finally, participants chose which of their online and in-person classes to consider for this study. Thus, the classes that students selected varied in subject, discipline, and instructor, both between and within students. For example, a student may have selected a well-liked psychology course (within their major) for their online class and a required statistics course (outside of their major) for their in-person class. Differences in students' majors and interests, as well as different instructors with different teaching styles, may have influenced students' perceptions of connection and engagement, and weakened the inferential analysis. Future research should hold these factors constant to help isolate the effect of classroom format on perceptions of connection and engagement. For example, researchers could evaluate differences between online and in-person classes on the same topic with the same instructor.

This study was conducted in order to bridge the gap in available literature on connection and engagement in synchronous online courses. While inferential analysis failed to confirm our hypothesis that students would feel more engagement in their in-person classes, it did support the prediction that there would be a relationship between engagement and all types of connection. Our results suggest that for synchronous online classes, connection to classmates, instructor, and course material are more important predictors of engagement than format. These findings provide support for past research that has indicated a link between engagement and connection^{10,11}. If educators can implement ways to increase perceived connection in their online classes, engagement should increase in the same way it would in in-person classes. Research has shown that engagement in the classroom is an important predictor of student outcomes such as learning and performance^{7,8,9}. Therefore, increased connection should also improve these learning outcomes. Despite limitations, this study provides support for the relationship between connection and engagement and allows more insight into the perceptions of students so that educators can continue to improve online learning.

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