

# Impacting Student Satisfaction, Engagement and Motivation in Online and Traditional Classrooms

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**Abstract:** The COVID-19 pandemic altered the higher education landscape in a number of ways. It, specifically, made the online/distance learning environment more prominent among institutions as 96% of colleges and universities in the U.S. shifted at least some of their course offerings online. The contrast of in-person and online teaching outcomes has become increasingly relevant due to these circumstances. Given the necessity and ubiquity of online classes, it is as important as ever to understand how to best implement an online course. The current project explored how student characteristics, instructor characteristics, and classroom characteristics in both traditional and online classes in the U.S. differed in terms of motivation, engagement, and satisfaction. Results indicate that only instructor rapport and credibility were perceived as important in online classes whereas perceived classroom interaction was important for in-person classes. Student reports of motivation, engagement, and satisfaction were higher for in-person classes than online classes.

Keywords: engagement, motivation, satisfaction, online class, COVID-19

## Introduction

The SARS-CoV-2 (COVID-19) pandemic, with its unprecedented transmissibility and notable death rate, impacted nearly every social institution and behavioral norm globally beginning in the spring 2020. The first known case of COVID-19 in the United States was identified on February 26, 2020 (Johns Hopkins University, 2020) with cases by June 1, 2020, growing to 1,811,655 (108,500 deaths), according to the Johns Hopkins University Coronavirus Resource Center. Entire industries like travel, dining, entertainment, and others subsequently shuttered due to government-imposed restrictions or mandated closures. In the United States, education, both K-12 and higher education, was one of the industries most directly affected with wholesale changes to schedules, cancellations to ancillary academic events, and many institutions shifting to online and hybrid instruction (Lederman, 2020b).

Higher education, specifically, has long been migrating some of its programming to the virtual space, employing either asynchronous, synchronous, or hybrid instructional models, but transitioning the entire landscape to online learning was not a reality among most colleges and

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universities. The response to COVID-19 required extraordinary alterations to the teaching model across the globe (Barsotti, 2020). The virus continued to disrupt education and administrators considered the optimal ways to address the needs of their students while simultaneously balancing their budget sheets in the fall of 2020 and spring of 2021 (Barsotti, 2020). Among the lingering questions institutions faced in addressing the COVID-19 disruption was how to best deliver curricular content in an environment that was unfamiliar or uncomfortable to a majority of the educators. Institutions across the United States, as a result, employed a range of tactics that varied from returning to as close to prototypical classroom environments as possible to maintaining a completely virtual course catalogue for the entire 2020-21 academic year. According to the *Chronicle of Higher Education*, 34% of four-year colleges and universities were primarily online, 23% were primarily in-person, and 21% offered hybrid models in the fall 2020. Only 4% of the nearly 3,000 schools examined were fully in-person and 10% were fully online in the fall (Chronicle of Higher Education, 2020).

The contrast between traditional and online courses is emphasized in the way that each course is delivered as well as unique opportunities and limitations in each setting. The differences between course types may have disparate effects when taught in-person versus online. However, while the conclusion that these different experiences are due to the format of the course belies other potential factors like student or instructor. Given the necessity and increasing ubiquity of online classes, it is as important as ever to understand how to best implement an online course (Rof, Bikfalvi & Marques, 2022). As such, the purpose of this study examined which elements of online and in-person courses predicted the most student success in order to make pedagogical recommendations for those teaching online courses.

## **Online Courses**

With a growing demand to offer more flexible classes to accommodate non-traditional students, paired with technological improvements, online courses have become common practice in higher education. In fact, El Mansour and Mupinga (2007) argue that online classes offer certain advantages over face-to-face courses: Proximity is not a constraint, the instruction is often more standardized, they offer more flexibility and access for students who may not be able to attend in-person classes. These courses are cost-efficient for staff, do not require physical classroom space, and are often completed at an accelerated pace. There are two types of online course structures: asynchronous and synchronous (Martin, Stamper & Flowers, 2020). Asynchronous instruction is a modulated course structure that students engage with the material at their own rate within a specified timeframe absent of direct face-to-face engagement with the professor. Synchronous instruction is closer to a traditional classroom structure where set meeting times and face-to-face engagement occurs through online platforms like Google Meet, Skype, or Zoom. In either scenario, these factors have made online courses a popular alternative to traditional classes for administrators (El Mansour & Mupinga, 2007). However, as institutions offered more online courses, instructors were pushed to find new ways to teach the same content in an online format without compromising the educational experience (Ouyang & Scharber, 2018).

Although online teaching platforms may offer many advantages, adjusting courses for the online space presents a variety of unique challenges. Instructors have voiced concern over lack of, or improper training when it comes to the technical challenges of teaching online classes (Hendricks & Bailey, 2016; Lederman, 2020a). As a result, instructors may find themselves unprepared or unsupported in teaching online. For as many opportunities as online classes present, both administrators and faculty are acutely aware that a poorly run online course may

lead to lowered retention and success rates (Frydenberg, 2007; Nagel, Blignaut, & Cronjé, 2009). This has become especially important for faculty members who feel ill-equipped to teach online, but have been mandated to do so, and they are migrating courses to an online platform when the content may not be conducive for it. For example, courses that require public speaking, technical production, or physical interactions are challenging to house online.

Though some investigations into the differences between online and traditional classrooms purported no difference in student perceptions of learning on either platform (Allen, Bourhis, Burrell, & Mabry, 2002; Kuo, Walker, Schroder & Belland, 2014), other research has uncovered some nuanced differences. For instance, Mullen and Tallent-Runnels (2006) asserted that differences in outcomes for students enrolled in online and traditional learning environments depended on the specific characteristics of both students and instructors. Mullen and Tallent-Runnels (2006) found that differences in self-regulation, satisfaction, and perceptions of learning in online environments impacted student outcomes. Additionally, they found the instructor's ability to provide affective support in online classes was strongly correlated with students' perceptions of satisfaction.

Similarly, Palmer and Holt (2009) surveyed students in both online and traditional classrooms to understand how student perceptions of the learning experience differ. Results indicated that "students in wholly online units were most concerned about the same things that concern any student – what do they need to do to get a good grade and [whether or not they received] useful feedback on their assignments" (Palmer & Holt, 2009, p. 18). Students in the online classes reported their concerns focused mainly on communication, specifically worrying about the way technology may impact their ability to communicate with the instructor and their ability to express ideas.

The previous examples demonstrate that a variety of factors impact student learning such as the students' abilities, instructor characteristics, as well as specific features of the learning platform that may assuage concerns about communication related to the course. They do not, however, address the acquired circumstance of shifting a majority – if not all – of their courses online, which creates a litany of impactful issues on both the student and instructor. It is therefore increasingly important that the aforementioned characteristics work hand-in-hand to motivate and engage students so they may be successful in accomplishing their education goals.

## **Motivation and Engagement in Remote Learning Environments**

A key to success for both online and traditional courses is the degree to which students are motivated in the courses. Pintrich and Schunk (2002) defined motivation as "the process whereby goal-directed activity is instigated and sustained" (p. 5). Students may be motivated because they expect positive outcomes (*approach motivation*) or because they fear negative outcomes (*avoidance motivation*; Elliot, 1999). Thus, instructors who wish to motivate students should give them a reason to do so. Similarly, intrinsic and extrinsic motivations may impact how a student engages in a class (Deci, Nezlek & Sheinman, 1981). If students are intrinsically motivated, the reasons for their actions lie in themselves and their personality; for example, it may be that they have high need for cognition or are certainty-oriented human beings. On the other hand, motivation may also lie in the inherent qualities of the task at hand; the student may find a task interesting or enjoyable (Deci & Ryan, 2000). If students are extrinsically motivated, their motivation is tied to incentives, be it grades, praise, or wanting to avoid negative consequences (Deci & Ryan, 2000). Therefore, factors that impact student motivation are multifaceted.

Xie, DeBacker, and Ferguson (2006) found that if students were intrinsically motivated to participate in online discussions, they were more active. This was especially the case if they

found the courses interesting and enjoyable. Interest, however, is frequently tied to novelty (Ryan & Deci, 2000), and over the course of a semester, novelty may wear off. Therefore, intrinsic motivation in online courses is likely to decrease over time (Xie, et al., 2006). This, again, is an untested phenomenon resulting from the COVID-19 pandemic. Depending on the circumstance, students may be forced to take online classes when they did not want to, they may have multiple online classes when their preference was to be in-person, and there are mitigating factors like interactions and socialization that impact the environment. Included in the complexities of this situation is accessibility. Access to internet and time are often variables outside of the student's control in an environment away from school (Aguilera-Hermida, 2020).

If intrinsic motivation decreases over time, one might logically conclude that extrinsic motivation can serve as a substitute. However, motivation is a complex concept and researchers have not been able to support that extrinsic motivation can bolster intrinsic motivation once it wanes (Deci and Ryan, 1980; Deci & Ryan, 2000). Incentives such as grades can motivate students to study and participate, but they can also have the opposite effect. Oftentimes, extrinsic cues undermine intrinsic motivation. For example, a student may focus on the extrinsic cue of getting a good grade in a class instead of focusing on the intrinsic motivation of learning outcomes and self-expansion. In cases where students have put external motivations like grades ahead of internal motivations like education, students are more likely to become frustrated when they find that they cannot achieve the internal cue that motivated them in the first place (Garbarino, 1975; Deci & Ryan, 1980).

The way that motivation affects students over the lifespan of their academic careers is nuanced and depends on a variety of other factors including individual characteristics of the student. Scholars have found that when it comes to predicting which students will be successful in online classes, much depends on the student's frame of mind and their prior achievements (Bernard, Brauer, Abrami, & Surkes, 2004). For instance, research indicates that female college students generally have higher levels of motivation than males (Brouse, Basch, LeBlanc, McKnight, & Lei, 2010). Similarly, Kim and Frick (2011) found that "perceived relevance, reported technology competence, and age" (p. 13) were the main factors that predicted a student's motivation when he or she took an online class. However, when the class was in progress, student motivation depended on a variety of qualities of the instruction. For instance, questions of the instructor's competence were more concerning while the class was in progress than when a student was merely deciding on whether or not to take an online class.

Student motivation has also been linked to an instructor's nonverbal intimacy (NVI). Students tend to be more motivated if the instructor reduces psychological distance. This can be accomplished with behaviors such as keeping eye contact, physically turning toward students, or smiling (Comadena, Hunt, & Simonds, 2007). However, because many online courses are primarily text-based, conveying nonverbal intimacy can be challenging. Trad, Katt, and Miller (2014) found that a lack of NVI can be somewhat offset by face threat mitigation, which means "using verbal and linguistic strategies to mitigate threats to students' face when communicating potentially threatening messages" (p. 137). In practice, this may mean showing tact and sensitivity and giving the student the feeling that the instructor cares. In addition, Baker (2010) found that instructor presence was a strong predictor of student motivation in online classes. Instructor presence refers to the course facilitator's 'visibility.' When students feel as though the instructor is not very involved in the course, they begin to feel disconnected and their motivation suffers. In summary, maintaining student motivation in online courses is challenging but the more an instructor interacts with the students the more likely it is that motivation will endure.

While motivation is the interplay of instigation and sustainability toward a goal-specific task, engagement is the devotion, through resource deployment, toward a task (Pittaway, 2012); another element critical to successful online courses. In fact, Chiu (2021) argues that student

engagement is “energized by motivation” (p. S14) and that understanding how “technologies in remote classrooms motivate student engagement and learning” (p. S15) is key to optimizing student learning. Skinner and Belmont (1993) referred to student engagement as a combination of emotional and behavioral components that lead to student involvement in attaining learning outcomes. As it pertains to this study, technology and distance learning have been widely studied and have had varied impacts on the engagement of students who partake in online classes.

Instructors typically attempt to increase student engagement and facilitate the retention of information (Coakley & Sousa, 2013) through optimal overlap of perceived classroom interaction, active learning, course content, and instructor feedback (Corso, Bundick, Quaglia, & Haywood, 2013; Fletcher, Dowsett, & Austin, 2012). In this view, classrooms may become ineffective because of imbalances in one of these three areas. The intersection of these variables provides an interesting conceptual framework that guided this study’s construction. Specifically, the overlap between integral players (students, teachers, content) and core responsibilities (active learning, collaboration, interaction) illuminated target concepts to investigate. In light of the importance of satisfaction, engagement, and motivation broadly, and the impact that individual differences have on interaction, these concepts are critical to an effective classroom regardless of whether the classes are online or offline.

Engagement theory similarly asserts that technology, when used appropriately, can facilitate engagement among students and teachers (Beldarrain, 2006), which also enables active learning, collaboration, and interaction to exist among distance learners. Scholars have uniformly stressed that engagement is an extremely essential outcome for fostering fertile learning environments (Beldarrain, 2006; Pittaway, 2012; Skinner & Belmont, 1993). Motivation and engagement help to facilitate student work that achieves their goals satisfactorily.

### **Student Satisfaction in Remote Learning Environments**

Online education has grown exponentially since the turn of the 21st century, with nearly seven million students enrolled in distance learning courses at accredited colleges or universities across the United States (U.S. Department of Education, 2019). This figure, of course, will be exponentially higher in the fall of 2020 due to the COVID-19 pandemic and the subsequent decision by institutions to move instruction online. Previous research on course satisfaction indicates that regardless of platform, students were most satisfied when variables like effective instruction and classroom management were managed (Arbaugh, 2001; Opdenakker & Van Damme, 2006). The landscape of classroom enrichment scholarship has comprehensively focused on satisfaction as an indicator or measure of academic success, which is also a pillar of this current research project.

Given the premium put on satisfaction with content, instructors, and classmates, it is not surprising that this variable is often used to gauge efficacy of the learning environment. Sun et al. (2008) noted that there are six factors that contribute to student satisfaction: student, teacher, course, technology, system design, and environmental dimension. Frisby, Goodboy, and Buckner (2015) concurred with those findings and further noted that the inverse, student dissatisfaction, stems from two predominant factors: poor teaching and negative classroom experiences. Though satisfaction is generally reported on holistically, what makes for a satisfying experience, just like what engages students, is often due to a variety of individual characteristics of both students and instructors and the design of the classroom setting.

Palmer and Holt (2009) undertook an examination of student perceptions of satisfaction with wholly online classes, assessing features of the class and instructor, and found that

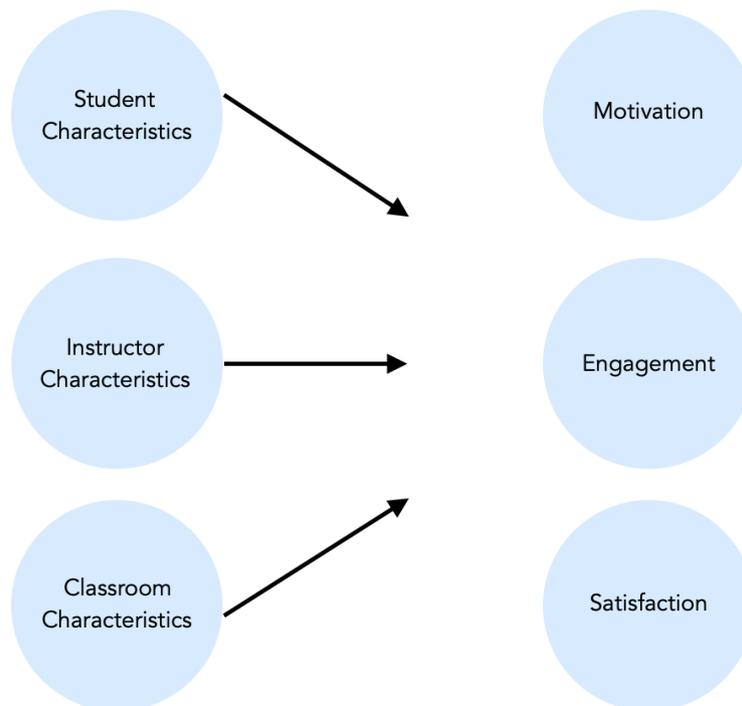
characteristics of both the students and the instructor impact learning outcomes. Students, in particular, rated organizational skills and self-regulation as factors that influenced their satisfaction with online classes, while timely instructor feedback was rated as highly important and yet something that they are often unhappy with (Palmer & Holt, 2009). During the COVID-19 pandemic, students noted they were most satisfied with their online classes when they were able to record lectures and engage with material from the comfort of their own homes (Fiorini, Borg, & Debono, 2022).

Zhan and Mei (2013) examined the psychological characteristics of academic self-concept and social presence on learning achievement and found that social presence had the greatest impact on learning achievement in online classes. Meaning, students in online classes reported perceived social interaction was an integral factor in their academic achievement and, in turn, their success. Similarly, Zhu's (2012) investigation of online learning found that students reported online platforms provided more of an avenue for collaborative learning but were especially disappointed when technology negatively impacted their interactions with their instructor, thus impacting the rapport that instructors need to have in order to run an effective classroom. In fact, during the pandemic instructors who transformed their classes into flipped instruction with teamwork and project-based components found that student self-efficacy, and in turn, overall reports of satisfaction, were increased (Awuor, Weng, Piedad & Military, 2022).

The overlapping importance of effective teaching and an engaging classroom environment provides a framework for understanding the impact that the online learning setting has on satisfaction. Additionally, myriad studies have found evidence that technology (Dang & Zhang, 2022), the treatment of students by instructors (Arbaugh, 2001; Gray & DiLoreto, 2016; Opendakker & Van Damme, 2006), and study habits (Iqbal, Asghar, Ashram & Yi, 2022) all impact learner satisfaction. While researchers often have an eye toward the impact that technology has directly on students, like accessibility to resources, one must not overlook the fact that technology may help or hinder secondary factors such as communication. In fact, Rabe-Hemp and Woollen's (2009) study on factors that influence satisfaction in online and traditional classes found that online students, as compared to those in traditional face-to-face classrooms, were significantly less satisfied with the perception of classroom interaction even though there was no difference between online and traditional classes in levels of satisfaction for interactions with students or the institution. Given the lack of clarity in the research on satisfaction, this scholarship seeks to further understand the way that satisfaction is impacted in online and traditional in-person platforms. As a result, the researchers argue that online and traditional classes will differ in terms of student satisfaction based on the aforementioned dimensions.

In summary, this study is interested in exploring how instructor and student characteristics in both traditional classes and online classes differ in terms of key elements of an effective classroom: engagement, motivation, and satisfaction (See Figure 1 for theoretical model). Based on the preceding literature, the researchers believe that this is an area with many conceptual overlaps that is fruitful for exploration.

Figure 1: Theoretical model among variables



### Research Question

RQ: What is the impact of perceived classroom interaction, instructor characteristics, and student characteristics on satisfaction, motivation, and engagement in online classes versus in-person classes?

### Method

The surveys were administered prior to the COVID-19 pandemic, which provided a perspective of the online educational space that was at-will rather than required. This non-probability convenience sample of student participants consisted of 176 individuals recruited through a variety of means. Faculty with access to student pools were contacted directly through social media (e.g., Facebook & Twitter) or personal email and asked to share the study URL along with our recruitment script for the students which read: “Student participants are requested for a study of college education. You will be asked to report on your impressions of a college course. Your responses in this study will be anonymous; there will be no way for your answers to be linked with your identity with their classes.” Recruitment also extended to professional listservs (e.g., Communication Research Theory Network) where posts directed at teaching faculty noted our interest in recruiting students currently enrolled in college courses of any format to complete an online survey on college education and included a URL for the study. The script read “We are currently recruiting participants for a study on college education. We would like to invite you to share the URL below with your students who will be entered for a

chance to win \$50 gift certificates for Amazon. Participants must be currently enrolled as a student in a college class of any format.” The majority of our participants were female (64.8%), ranging in age from 18 to 50 ( $M = 21.90$ ,  $SD = 4.90$ ). In exchange for participation, they were given the opportunity to enter their names in a lottery in which recipients were randomly selected to receive a \$50 (USD) gift certificate for Amazon.

Using a method established in Oliver and Hartmann (2010), once logged into the online questionnaire, participants were randomly assigned to recall and name either the best in-person class ( $n = 114$ ) they took or the best online class they took ( $n = 62$ ). If participants could not recall an online course or an in-person course, they were funneled to the other condition. Based on the frequencies above, our sample was more likely to recall an in-person class. Participants were asked to respond to the following questionnaire items with that course in mind.

## Measures

*Engagement* was assessed with a seven-item scale adapted from Cegala’s (1981) interaction involvement measure. Sample items included, “During class I listened carefully to others and obtained as much information as I could.” Items were measured on a 7-point Likert-type scale where 1 represented “strongly disagree” and 7 represented “strongly agree.” These items had high reliability ( $\alpha = .71$ ).

*Motivation* was assessed with a six-item scale adapted from Harter (1981). Sample items included, “I tried my best while in this class,” and, “I was invested in performing well in this class.” Items were measured on a 7-point Likert-type scale where 1 represented “strongly disagree” and 7 represented “strongly agree.” These items also had high reliability ( $\alpha = .90$ ).

*Satisfaction* was assessed with a 16-item scale adapted from Downs and Hazen (1977). Sample items included, “I was very satisfied with this class,” and “I was satisfied with recognition of my efforts.” Items were measured on a 7-point Likert-type scale where 1 represented “strongly disagree” and 7 represented “strongly agree.” These items also had high reliability ( $\alpha = .97$ ).

*Instructor characteristics* were assessed with two measures, including teacher credibility and instructor rapport. *Teacher credibility* was assessed with a 12-item scale adapted from McCroskey and Young (1981). Participants ranked the instructor on a 7-point semantic differential scale. Sample items included, “inexpert/expert,” and, “dishonest/honest.” Items were measured on a Likert-type scale where 1 represented “strongly disagree” and 7 represented “strongly agree.” These items also had high reliability ( $\alpha = .89$ ). *Instructor rapport* was assessed with Lammers and Gillaspay Jr.’s (2012) Student-Instructor Rapport Scale-9. Sample items included, “your instructor communicates effectively with you” and “your instructor is approachable when you have questions or comments.” Items were measured on a 7-point Likert-type scale where 1 represented “strongly disagree” and 7 represented “strongly agree.” These items had high reliability ( $\alpha = .97$ ).

*Student characteristics* were also assessed with two measures including student study habits and student self-regulation. *Student self-regulation* was assessed with a six-item scale adapted from Holcomb, King, and Brown (2004). Sample items included, “I use my time effectively,” and, “I am able to get things done on time.” Items were measured on a 7-point Likert-type scale where 1 represented “strongly disagree” and 7 represented “strongly agree.” These items also had high reliability ( $\alpha = .80$ ). *Student study habits* was assessed with a six-item measure that was created to tap into habits of successful students. A 7-point scale ranging from 1 “very poor”

to 7 “very good” assessed student attendance, grades, participation, motivation, meeting deadlines, and class preparation. These items had high reliability ( $\alpha = .81$ ).

*Classroom characteristics* were also assessed with two measures including *perceived workload* and *perceived classroom interaction*. *Perceived workload* was assessed using the NASA task-load index (TLX). This multi-dimensional measure has six factors including mental demand, physical demand, temporal demand, frustration, effort, and performance. The twenty-step bipolar scales are used to obtain a score between 0 and 100. Overall workload is assessed by combining scores on all six dimensions. This measure was reliable ( $\alpha = .72$ ). *Perceived classroom interaction* was assessed with the perceived classroom interaction items from Arbaugh’s (2000) technology acceptance model. Ten items comprised this measure which was assessed on a 7-point Likert-type scale with items including “I felt the quality of class discussions was high throughout the course.” This measure had high reliability ( $\alpha = .80$ ).

Finally, two variables related to experience with technology were included as covariates. *Computer self-efficacy* (Cassidy & Eachus, 2002) is a 30-item measure assessed on a 7-point Likert type scale with items such as “Computers frighten me”. This measure had acceptable reliability ( $\alpha = .83$ ). *Perceived usefulness of technology* (Davis, 1989) is a 6-item measure with a 7-point Likert-type scale (likely - unlikely) and includes items such as “Using technology in this class enhanced my productivity”. This measure had high reliability ( $\alpha = .96$ ).

## Results

Prior to the main analysis, the data was cleaned, reverse-coded items transformed, and aggregate indicators were created from the unidimensional measures by calculating a mean from individual scores. Descriptive statistics were also analyzed (See Table 1 for mean and standard deviations of the dependent variables).

Table 1: Means and standard deviations for dependent variables

Variable	Mean	SD
Satisfaction	5.83	1.21
Motivation	6.35	0.86
Engagement	4.54	0.90
Teacher credibility	6.06	0.63
Instructor rapport	6.23	1.18
Student study habits	6.12	0.74
Student self-regulation	5.21	1.00
Perceived classroom interaction	5.11	1.04
Perceived workload	3.72	0.89

Computer self-efficacy	3.11	0.80
Perceived usefulness of technology	5.74	1.73

To address our research question (how online and traditional classes are perceived), a multivariate analysis of variance (MANOVA) was conducted. Prior to this test, the dependent variables were assessed to make sure they fit the requirements for a MANOVA; namely that they conceptually and empirically were related. The correlation matrix indicated that the student technology skill was not correlated with the other dependent variables and was therefore dropped from the analysis. The average correlation of the remaining variables was  $r = .214$  and Bartlett's test of sphericity was significant ( $\chi^2 = 903.88$  (54),  $p < .001$ ). Box' M was significant, which indicates a violation of homogeneity of variance at the multivariate level, however this is a sensitive test and the  $p$ -value was larger than .01. Omnibus multivariate tests were significant (Wilks'  $\Lambda = .72$ ,  $F(10, 165) = 4.34$ ,  $p < .001$ , partial  $\eta^2 = .21$ ).

At the univariate level, Levene's test was significant for four of the dependent variables, but the MANOVA is robust with respect to this violation. Univariate results indicate group differences for six of the dependent variables. Instructor credibility ( $F(1, 174) = 10.11$ ,  $p < .01$ , partial  $\eta^2 = .06$ ) was more important for in-person ( $M = 6.17$ ,  $SD = .52$ ) than online ( $M = 5.87$ ,  $SD = .76$ ) classes. Similarly, instructor rapport ( $F(1, 174) = 14.38$ ,  $p < .001$ , partial  $\eta^2 = .08$ ) was rated as significantly more important for in-person ( $M = 6.49$ ,  $SD = .94$ ) than online ( $M = 5.81$ ,  $SD = 1.42$ ) classes. The students' perception of classroom interaction ( $F(1, 174) = 4.60$ ,  $p < .05$ , partial  $\eta^2 = .03$ ) was also an important difference in course platforms. Interestingly, this was the only construct rated more important in online courses ( $M = 6.10$ ,  $SD = 1.35$ ) than traditional face-to-face courses ( $M = 5.53$ ,  $SD = 1.89$ ).

Finally, our outcome variables also had statistically significant group differences. Students reported significantly higher levels of satisfaction ( $F(1, 174) = 18.93$ ,  $p < .001$ , partial  $\eta^2 = .10$ ) in traditional in-person classes ( $M = 6.13$ ,  $SD = .97$ ) over online classes ( $M = 5.34$ ,  $SD = 1.40$ ). Students also reported their motivation ( $F(1, 174) = 20.05$ ,  $p < .001$ , partial  $\eta^2 = .10$ ) was significantly higher in traditional in-person classes ( $M = 6.56$ ,  $SD = .60$ ) than online classes ( $M = 5.99$ ,  $SD = 1.08$ ). Last, engagement ( $F(1, 174) = 11.94$ ,  $p < .01$ , partial  $\eta^2 = .06$ ) was significantly higher in traditional in-person classes ( $M = 4.71$ ,  $SD = .86$ ) than online classes ( $M = 4.24$ ,  $SD = .88$ ).

## Discussion

The COVID-19 pandemic forced 96% of schools to shift at least some of their curricula to online/distance learning in the fall of 2020 (Chronicle of Higher Education, 2020). Although students were enrolled in distance learning classes at the highest rate in higher education's history prior to the pandemic (U.S. Department of Education, 2019), there was no indication that an industry shift like the one that occurred beginning in spring 2020 would have such a significant impact on the marketplace. The complexities and relevance of this data, therefore, emerged as revelatory in light of notable changes to the higher education landscape that have been widely discussed in both scholarship and the popular press. Namely, the results comparing group differences in terms of traditional in-person or online classes on a variety of dependent variables indicate that instructor characteristics (credibility and rapport) were more important for in-person classes than online classes. Students' perceptions of classroom interaction were significant, though more important for online classes than in-person classes. In line with previous research (Gray & DiLoreto, 2016), this study confirms the importance of interaction

in student learning. In online environments, interaction between students and instructor is the primary method students use to reduce uncertainty, receive feedback, clarify information, and make connection to their personal or professional lives. Therefore, it makes sense that the degree of interactivity facilitated by the platform is an important facet of student success. On the other hand, because of their richer channel, traditional in-person classes have a greater potential for interaction which lies in the hands of the instructor. Instructors who demonstrated credibility and developed rapport with their classes were seen as having an important impact on student learning. Finally, our outcome variables (satisfaction, motivation, and engagement) all were perceived as higher in in-person classes than online classes. The type of student, student study habits, student technology skills, and task load did not significantly discriminate between groups

Though scholars have asserted that technology competence (proper training, flexibility, and self-regulation) is a significant predictor of student outcomes in online courses (Kim & Frick, 2011) our findings suggest that student outcomes are most improved when interaction is achieved in a course, be it virtually (student perceptions of interaction) or face-to-face (instructor rapport). As pointed out by Wang and Newlin (2001), a lack of face-to-face interaction can lead students to feel less connected to the instructor, content, and course. It can be assumed that this is especially influential when a student's entire semester has shifted online rather than taking one or two courses virtually. Classroom interaction does not only refer to communication between students and the instructor, but also the students themselves. For instructors, facilitating discussion, encouraging interaction, and creating an atmosphere that caters to open communication may be among the most important steps to take to ensure student satisfaction, motivation, and engagement. Achieving these goals may not necessarily involve use of the most recent technology, even in online courses. Instead, this may mean using technology to foster a feeling of connection, interaction, and trust.

Maybe the most surprising takeaway from this study, however, might be that the success of a class appears to depend on fewer factors than instructors might expect. The instructors' credibility and their ability to create an environment that is perceived as interactive and collaborative has larger impacts on students' learning than other variables. This outcome is potentially most relevant to instructors who are occupying online spaces despite their desires to teach face-to-face in lieu of the COVID-19 pandemic. Identifying specific classroom tactics like interactivity and collaboration allows instructors to focus energy on precise pedagogical methodologies and student learning outcomes that address both components. While establishing credibility is a more longitudinal and abstract objective, adjusting the classroom environment to incorporate interactivity and collaboration is a tangible, accessible directive that can be measured. Further, they are outcomes that instructors can solicit assistance from institutional staff if they are not comfortable.

Many online courses employ discussion forums, which can be used for interaction with both the professor and fellow students. However, different tools and activities should be evaluated in respect to their potential to positively affect perceived classroom interaction. With in-person courses, there are many opportunities for informal interaction, for example before and after class or during activities or group work assignments. In online classes these informal opportunities may be less frequent, but emerging technology can support these occasions. For instance, instructors can interact with students via Google Meet, Skype, or Zoom and have virtual face-to-face conversations. The learning management systems that schools employ now offer interfaces that enhance regular communication, whether it be through VoiceThread, blogs, or podcasts. And, instructors can now add their voices to PowerPoint presentations or YouTube videos that allow students to engage with an instructor's persona more directly.

While interaction with the instructor and classmates may seem to be limited in online environments, there are possibilities where this might be enhanced. In virtual environments the

rules of interpersonal communication and relationships do not necessarily apply due to interface designs that either enhance or degrade interactions and relationships (Bailenson, Beall, Loomis, Blascovich, & Turk, 2004). Behavior can be manipulated in ways that it cannot be manipulated in the physical world (Bailenson & Yee, 2006). People can transform themselves, how they behave, and interact with other people in a freer virtual environment. (Bailenson et al., 2004). In the context of online education, instructors and students could alter themselves in order to facilitate a more effective classroom. For example, in an offline class an instructor can only make eye contact with one student at a time but in an online class, an instructor could implement an augmented gaze and make eye contact with each student at once (Bailenson, Beall, Loomis, Blascovich, & Turk, 2005).

### **Limitations and Practical Suggestions**

Given the challenges in fostering a dynamic classroom atmosphere in online courses, we suggest that instructors include deliberate exercises to enhance communication. These exercises can include things that might be discussed more casually during in-person classes but not in online classes. For example, classes could discuss favorite musicians, larger school-related issues, and weekend plans. For instructors who prefer to keep interactions related to class, providing forums and requiring students to respond to one another can prove useful to facilitate a classroom atmosphere. Classroom interaction may also include features that approximate face-to-face interactions like Google+ Hangout discussions, Skype office hours, and social media (e.g., Twitter chats & Facebook live).

When this is achieved, students become more engaged, motivated, and satisfied. The pedagogical benefits of these dimensions are detailed above and should be prioritized by instructors. In fact, the authors of this manuscript created and pilot-tested several evidence-based activities to increase motivation, engagement and satisfaction in both online and offline platforms. Initial results support the claims of this manuscript in that classroom atmosphere is critical to a successful classroom regardless of platform.

Finally, as with any investigation, limitations must be noted. The data for this study were collected prior to the COVID-19 pandemic. Students, typically, would enroll in online/distance learning courses voluntarily at the point of data collection and, most likely, had marginally different motivations for engaging in this environment. As institutions moved their curricula online, students were forced to choose between pausing their academic process or enrolling in online courses. While the researchers believe that the results of this study would not have changed in a significant way, there is certainly a larger population of students now who have a perspective on this topic.

### **Conclusion**

COVID-19 created an environment where the separation lessened between online and in-person teaching spaces. Prior to the pandemic, students had more autonomy over their participation in distance learning and, therefore, had specific expectations of their engagement. As institutions increasingly shifted their programming online, students and educators were forced to adapt to the opportunities and constraints of online instruction. The results of this study indicate that there are specific tactics in the form of course structure and delivery that will enhance the learning environment in terms of motivation, engagement, and satisfaction. Namely, instructors can be more deliberate in their attempts to foster interactivity and collaboration among students.

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