

Peers and Other Factors Impacting Students' Course Modality Selection

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Abstract

Numerous studies have examined the difference in student performance and learning outcomes in various course modalities, including online, hybrid, or face-to-face (Race et al., 2021; Hoffman & Elmi, 2020). Researchers have also examined the relationship between students' success in various course modalities and personal factors, such as self-discipline, self-efficacy, perception of online learning, and personality traits such as extroversion (e.g. Zimmerman & Kulikowich, 2016; Schniederjans & Kim, 2005; Keller & Karau, 2013). However, existing studies focusing on student decision-making when choosing course modalities are limited. These studies mainly focus on students' motivations and their personal preferences such as flexibility and instructor's presence in their decision on course modalities.

With the prevalent use of social media and online review sites, the effect of peers is another factor that could influence students' decisions about course modality, and this factor has not been examined in the literature. The purpose of this study was to evaluate the effect of students' perceptions of online learning and peer influence on their decision to take online versus face-to-face courses. Through the use of a self-reported survey, we found that overall course schedule, class start time, and ability to join study and peer groups had an impact on students' decisions about course modality. These findings could provide insight into course scheduling and enrollment management for higher education.

Introduction

In today's rapidly changing learning environment, which includes more online course offerings, examining students' decision-making when choosing online versus face-to-face course modalities has become increasingly important. Their modality choices may impact not only the course design but also resource scheduling at the administrative level. Understanding students' decisions and the decision-making process is important as it affects resource allocation within an institution's administration. For most higher

education institutions, student enrollment as a whole impacts the management of auxiliary operations such as housing, dining services, facility management, transportation services, parking services, as well as health and wellness needs. In terms of student success, students' decisions relate to the resource allocation for the different colleges and departments. Depending on students' major of study selections, students' decisions about course selection can affect the department's ability to plan and offer the appropriate courses to support their success.

Numerous studies have examined the factors that affect students' decision-making in higher education institution selection (Moogan & Baron, 2003), major of study or career planning (Cebula & Lopes, 1982; Porter & Umbach, 2006; Moakler Jr. & Kim, 2014), as well as course selection for non-required courses (Kardan et al., 2013; Ognjanovic et al., 2016). With the increased prevalence of online education and online course offerings for on-campus students, a few studies have examined students' choices regarding course modality selection between online, hybrid, and face-to-face courses (Artino Jr., 2010; Daymont et al., 2011). Of these studies, however, few, if any, have examined the effect that peers may have on these decisions. This study focused on decision-making for students who were primarily taking courses on-campus but had the choice to take some courses online.

The objectives of this study are three-fold. First, this study evaluated peer influence on students' decisions about course modality (online versus face-to-face) when both modality choices were available to students. Second, this study re-examined the effect of students' perceptions of online learning on students' preferences for course modality. Third, this study examined the combined effect of perception of online learning and peer influence on students' preference for course modality.

Student decision-making about course modality

Research on student decision-making in higher education has examined multiple decisions such as

institution selection (Moogan & Baron, 2003), major of study selection (Brunello et al., 2010), and course selection (Ognjanovic et al., 2016). This section summarizes the limited research in this area.

In evaluating students' decisions to choose an online versus face-to-face course modality, Artino Jr. (2010) evaluated two personal factors – motivational beliefs and achievement emotions – through a self-reported survey upon completing an online course. Artino Jr. (2010) also examined how online learning satisfaction was associated with the preference to take future online courses. Motivational beliefs were divided into task value beliefs and self-efficacy beliefs. Task value beliefs are individual students' judgment on the importance, usefulness, and interest in the course; self-efficacy beliefs are student's judgment of their capabilities to succeed in the course. Using logistic regression, Artino Jr. (2010) found that students with higher self-efficacy and higher online learning satisfaction preferred to take a future online course.

In a similar study, Daymont et al. (2011) examined management students' preference for online asynchronous and face-to-face courses. They found that students who preferred the face-to-face course modality often cited a preference for instructor presence and the advantages of face-to-face interactions. In contrast, students who preferred the online asynchronous course modality often cited flexibility as the main reason, even though they recognized that it requires greater self-discipline and more effort in time management.

Taken together, the Artino Jr. (2010) and Daymont et al. (2011) studies showed that students who preferred online course modality recognized that online learning requires higher self-efficacy. Both studies were conducted in early 2010, and research on student decisions about their course modality selection has remained limited. With the advancement in online learning, a re-examination of students' decision-making in course modality might provide further insights.

Perceptions and attitudes towards online learning

As perceptions will affect students' attitudes and motivation (Chen et al., 2016), evaluating students' perceptions of online learning is necessary to parse out the peer effect on modality selection. In the early years of online learning, Smart and Cappel (2006) compared students' attitudes toward two undergraduate business courses (an elective course and a required course). Four factors were investigated: overall satisfaction, effective and fun way to learn, time and effort, and difficulty. Their results revealed that students' attitudes toward an online elective course were significantly better than a required course. Smart and Cappel, (2006) conducted a comparative study to examine students' perceptions of online components in a face-to-face classroom (hybrid modality) and found that students rated the online components slightly better for elective courses, and slightly worse for required courses.

In another study of student perceptions, Rhema and Miliszewska (2014) investigated engineering students' attitudes toward and experiences of online learning at two Libyan universities. In this study, authors examined how students' attitudes towards online education were associated with other factors, including access to technology, skills in technology, and satisfaction with technology. Overall, students believed that they would acquire new knowledge and enhance their learning experiences through online courses. However, female students had more positive attitudes toward technology and online learning than male students. Students who had better technology skills had stronger positive attitudes towards online learning.

Students' perceptions of online learning are also associated with academic achievement in online courses. For example, Bernard et al. (2004) evaluated four factors as potential predictors of online learning achievement: general beliefs about online learning, confidence in prerequisite skills, self-direction and initiative, and desire for interaction. General beliefs about online learning, as well as self-direction and initiative, were both

positive predictors of online learning achievement; however, confidence in prerequisite skills was a negative predictor and desire for interaction was not a statistically significant predictor.

Overall, these studies indicate that students tend to have positive attitudes toward online learning, particularly in non-required courses, and that positive attitudes are associated with better academic performance in online courses. As perceptions towards online learning are associated in better academic success, it is important to consider other factors that shape students' attitudes toward online learning, such as peer influence. Moreover, it is possible that peers' attitudes toward online learning shape students' decision-making regarding modality selection.

Peer influence studies in higher education

To date, research in higher education has mainly focused on the effect of peer influence on student academic and nonacademic outcomes. The main areas of study include the effect of peers on students' intention to commit academic dishonesty, and the effect of roommates/dormmates on students' academic and nonacademic outcomes. The following sections summarize studies in these areas.

Academic dishonesty. McCabe et al. (2001) conducted a study that indicates that schools experience fewer cheating incidents when students possess a strong sense of responsibility towards their peers. This responsibility includes understanding one's role as a student. As a result of increased peer influence and role responsibility, instances of student cheating are reduced. Megehee and Spake (2008) found that cheating and plagiarism are prevalent practices among classmates. If students become aware that their peers have resorted to cheating and plagiarism, the likelihood of such behaviors increases among these students. Conversely, if students learn that their peers have been caught and punished for cheating and plagiarism, the probability of such behaviors decreases among these students. Teodorescu and Andrei (2009) found that peer influence factors were found to be the primary

cause of cheating. When students observed cheating behaviors among their peers in college, it increased their intention to cheat. The study found that the behaviors of peers significantly influenced students' cheating intentions. Therefore, peer influence is positively correlated with academic dishonesty among university students. Carrell et al. (2008) used self-report academic cheating data from three US military service academy cohorts to examine the peer effects on academic cheating, and they found that when there is a high level of peer cheating, it leads to a higher probability that individual students will cheat. Carrell et al. (2008) used the cohort data to determine that the social multiplier for academic cheating is around three. This means that if one additional college student cheats, approximately 0.67 to 0.75 additional college students are also likely to cheat.

Student outcomes: Academic and Non-academic.

In an elite US university, Sacerdote (2001) examined the effect of randomly assigned roommates and dormmates among the freshman cohort on : 1) grade point average (GPA); 2) choice of college major; 3) alcohol consumption; and 4) decisions to join social groups. Sacerdote found evidence of peer effects on students' GPA between roommates, and students' decision to join the same social groups among the dormmates. Using national survey data, De Paola and Scoppa (2010) examined the effect of peers on individual student performance in a mid-size Italian university and found that the quality of the peer group has a significant impact on academic performance. Using survey data of incoming students and a lottery-based roommate assignment system from a large US state university, Kremer and Levy (2008) examined the effect of roommates' alcohol consumption on students' academic performance. They found that having a roommate who consumes alcohol frequently before entering college negatively affects individual academic performance (GPA); this effect is especially pronounced among male students.

As studies showed that peer influence is prominent in students' decision-making inside the

classroom (e.g., academic dishonesty) as well as outside of the classroom (e.g., roommates), it is important to examine peer influence on students' decision making when choosing course modalities. Indeed, the proliferation of online course and instructor rating apps suggests that peers can potentially play a powerful role in course selection and course modality selection.

Research Questions

Because there is limited research on the effects of peer influence on course modality selection, this study investigated the following research questions:

1. What are factors that contribute to peer influence on students' decisions regarding course modality when both online and in-person modalities are available?
2. What are the effects of students' perceptions of online learning on their preference for course modality?
3. What are the effects of students' perceptions of online learning and peer influence on their preference for course modality?

Methodology

We used a survey approach for this study. The online survey consisted of three sections: demographic and personal factors, perception of online learning, and peer effect. The following sections provide details of each section of the survey. Appendix A contains the questions for the perception of online learning and peer effect section of the survey.

Demographic and personal factors

This section consisted of 13 questions, with the following breakdown:

- Demographic: Age, gender, class standing, and residency status (4 questions)
- Prior online learning experience within and outside of Oregon State University (OSU) (2 questions)

- Preferred course modality and decision (3 questions)
- Importance of location, course schedule, and course start time when selecting on-campus courses (4 questions)

Perception of online learning questionnaire

The perception of online learning was adapted from a validated questionnaire developed by Bernard et al. (2004) to predict online learning achievement. The subscale focuses on general beliefs about online learning. It consists of eight items using a 6-point Likert scale. The current study adapted questions to assess students' perception of online learning; for example, "I believe a complete course can be taught online without difficulty." The Bernard et al. (2004) subscale that was adapted for this study had a reported internal consistency of 0.82.

Peer influence questionnaire

A survey was created to examine peer influence, as none of the existing published studies utilized a survey method. This section of the survey consisted of 20 items using a 5-point Likert Scale. The five main factors for the peer effect were as follows:

- Direct peer input: Students asked for input from a peer that they interact with or have interacted with in person (3 items)
- Indirect peer input: Students solicited information through websites or social media from peers that they may or may not know personally (4 items)
- Decision-based on peer input on course features: Students decided on taking a course modality based on in-person peer input (4 items)
- Conformance or imitation: Students decided on a course modality based on the decision of other peers in their group (3 items)
- Concern of future peer group acceptance: Students decided on course modality based on the concern of their ease or ability to join a study group (6 items)

The rationale for the main factors included for the peer influence questionnaire are as follows:

Direct and indirect peer input: These two factors assessed the information transmission between peers, which is a necessary condition for peer influence to exist (e.g., students' sources of information and their perceived importance of each of the sources).

Decision based on peer input: This set of questions examined the students' decision based on their peer inputs.

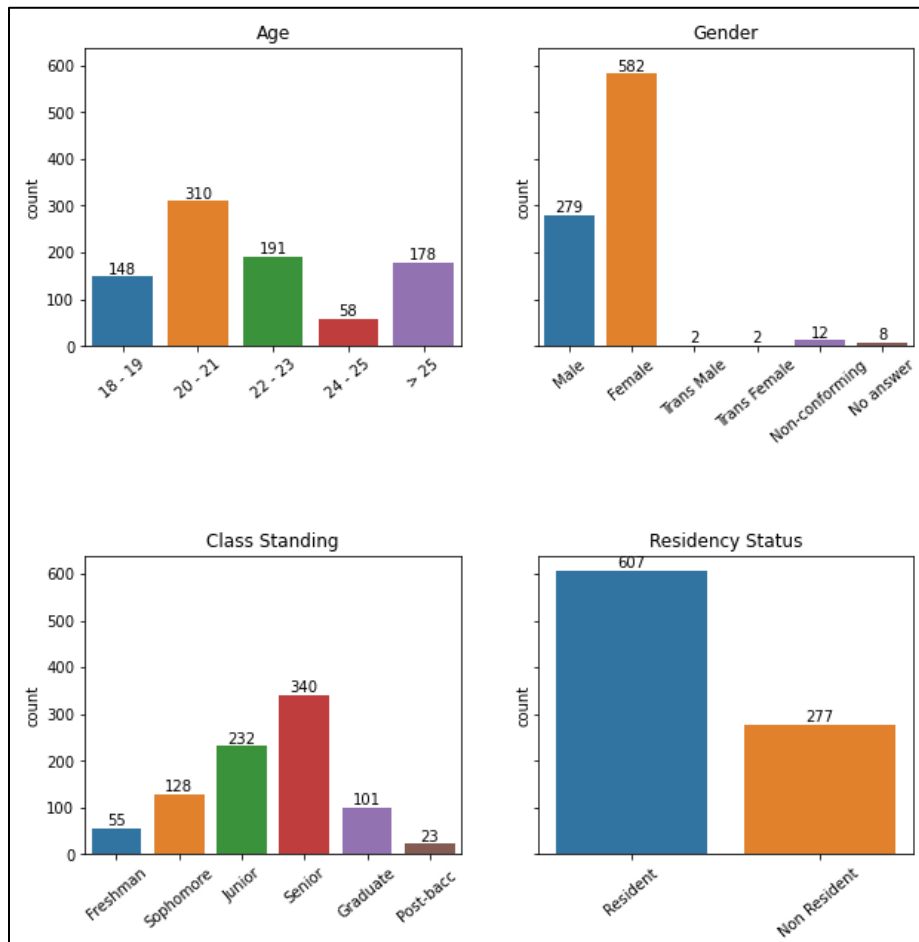
Conformance of imitation, and concern of future peer group acceptance: These factors assess the conformance to group norms, where a person may decide to change their behavior to prevent rejection from peers (Cialdini and Goldstein, 2004).

Participants

The online survey was sent to the university email addresses of all currently enrolled students at OSU University on February 25, 2020. This population included campus-based students who only took courses face-to-face, students who took a combination of face-to-face and online courses, and students who took all courses online. The survey was active through March 18, 2020. A total of 1,558 students participated in the survey, of which 880 responses were deemed complete and usable for the analysis.

Figure 1 shows the participants' demographic data.

Figure 1. Demographic data of the participants



Of the 880 responses, 751 responses were from undergraduate students, 100 responses were from graduate students, 6 responses were non-degree-seeking students, and 23 responses were post-baccalaureate students.

Results

Internal consistency of the survey subscales

Cronbach’s alpha was used to measure internal consistency on the perception of the online learning and peer influence portions of the questionnaire. The internal consistencies were 0.87 and 0.76, respectively. These are acceptable levels of internal consistency.

Among the 881 students who completed the survey, when both in-person and online modalities were available, 152 students (17.25%) indicated that they preferred online courses, 501 (56.87%) preferred in-person courses, while 228 (25.88%) indicated that they have no preference.

In Table 1, student ratings of the importance of classroom location, course schedule, course time, and tuition are reported, based on a five-point Likert Scale, with “1” being “not at all important”, and “5” being “very important”.

Table 1. Importance of course characteristics for graduate and undergraduate students

	Graduate (n = 100)		Undergraduate (n = 751)	
	Mean	Std. Dev	Mean	Std. Dev
Overall course schedule	3.93	1.11	3.99	0.94
Course start time	3.51	0.13	3.45	0.04
Tuition rate	3.21	1.55	3.58	1.26
Classroom Location	2.15	1.35	2.39	1.32

As is shown in Table 1, both graduate and undergraduate students rated their overall course schedule as highly important when deciding between course modality, followed by the individual course start time and tuition rate. For deciding between online or face-to-face courses, the location of the physical classroom on-campus for face-to-face courses was rated as less important by both groups of students.

Figure 2 shows the breakdown of students’ preferred class start time (from 8 am to 6 pm) by their course modality preference. The 10 am start time was the preferred start time for the majority of the on-campus students. The distribution of class start time was similar for students who prefer online courses, as well as those without a preference. Across course modality preferences, 10 am to 2 pm class start times were preferred by all groups of students. However, when comparing the percentage of students in each of the class start times, students who preferred online courses had a less pronounced preference for class start times compared to those who preferred in-person courses.

Perception and attitudes towards online learning

Eight items were adapted to assess students’ perceptions and attitudes towards online learning. Figure 3 shows the means for each item, grouped by students’ preferred course modality. The eight items were measured using a 6-point Likert scale, and the scoring was 0 “strongly disagree” to 5 “strongly agree” as shown in Appendix A.

In general, regardless of their preferences for online or in-person courses, students’ perceptions and attitudes towards online learning were relatively low, with an average of 2.10 for all students who responded to this survey. However, when students were grouped by their modality preference, those who preferred online learning had slightly more positive perceptions and attitudes towards online learning across the eight items of the survey.

Figure 2. Students' course modality preference and class start time preference

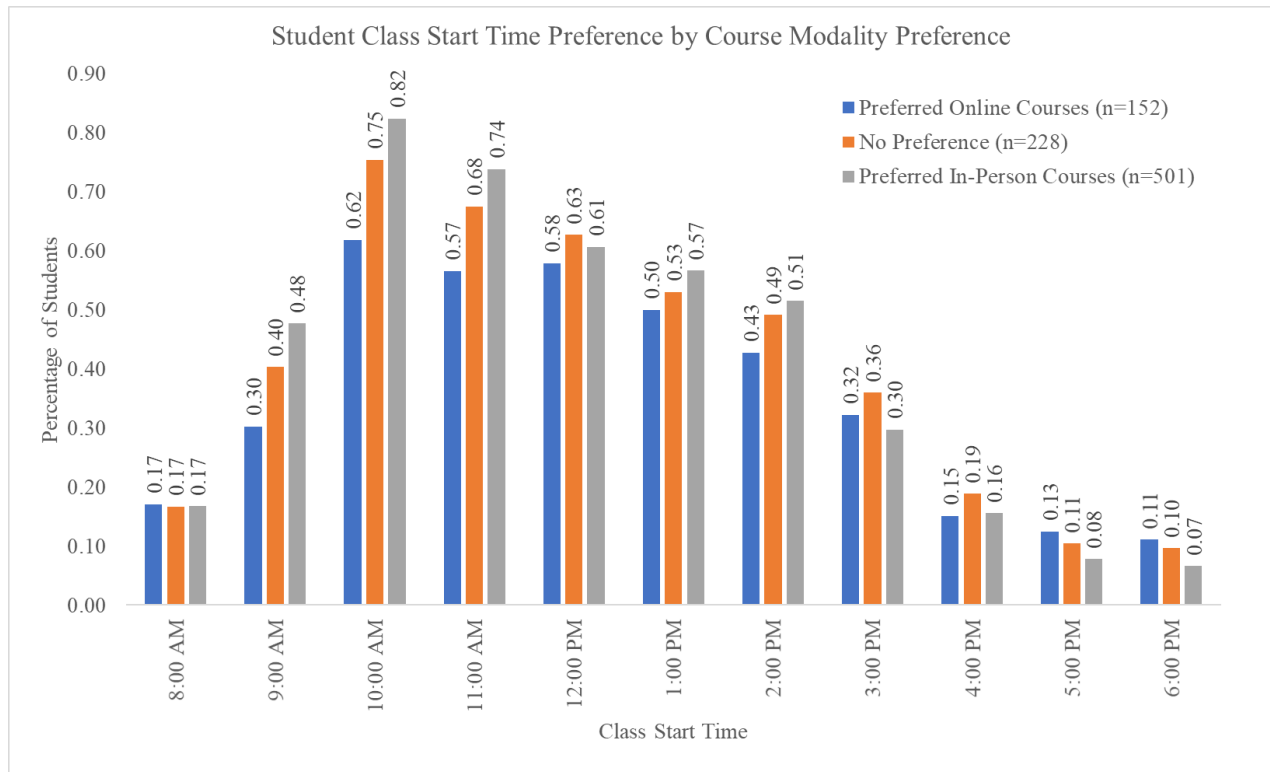
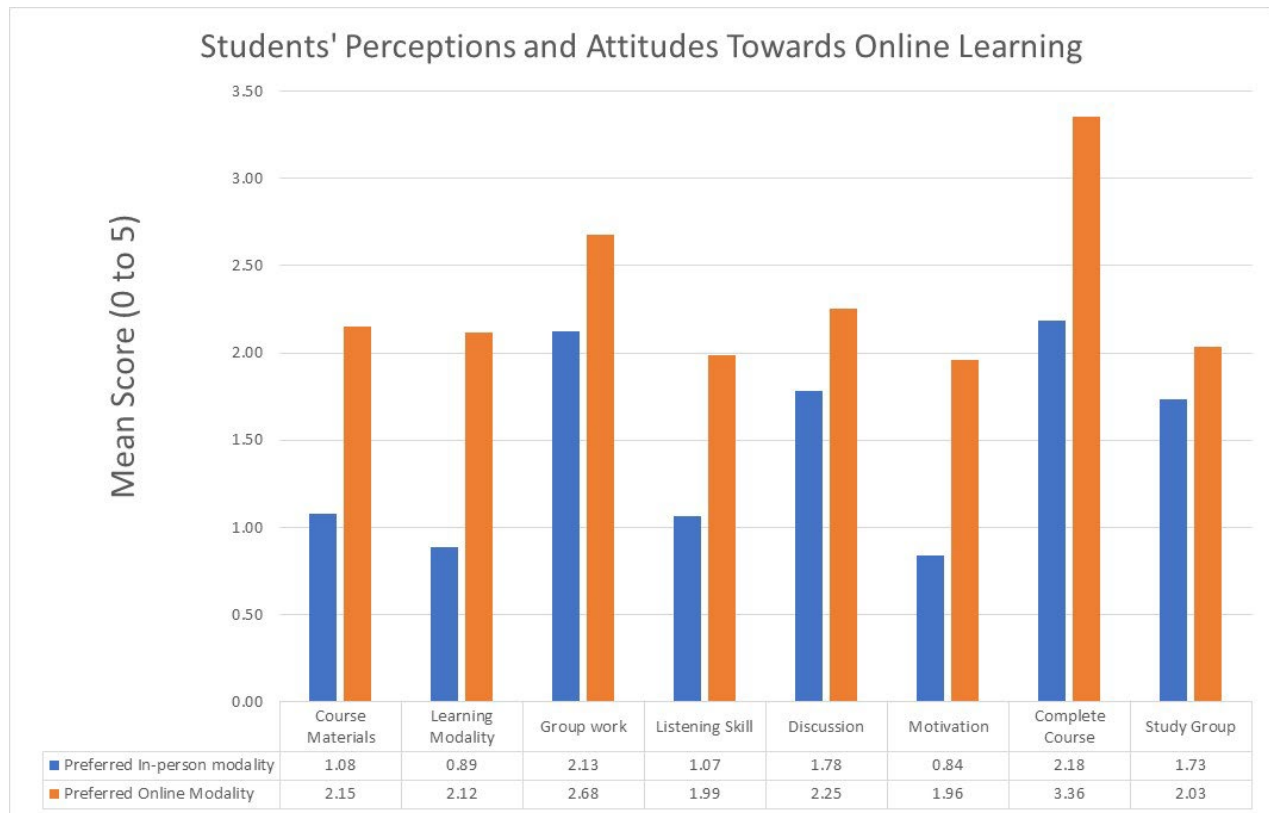


Figure 3. Perceptions and attitudes towards online learning by modality preference



Students' preference and decisions for course modality

In terms of students stated preference for course modality, their attitude towards online learning was correlated with their preference for online courses ($r = 0.5, p < 0.01$). Specifically, students who showed a clear preference for online classes stated that they learn better in an online class (Item 2 in Figure 3), that online classes are more motivating (Item 1 and 6 in in Figure 3), and they believe that courses can be taught online without any difficulty (Item 7 in Figure 3).

Peer influence in section/modality

Students' preferences to take an online course were correlated with the feedback from their in-person peers, specifically if their peers told them that the online version was easier, $r = 0.52, p < 0.01$, and the online version provides more feedback, $r = 0.50, p < 0.01$. When multiple in-person and online sections were available for students, Table 2 shows the correlation between students' concerns about their peer group acceptance and their decision to choose a different modality/section than their peers.

The correlation analysis revealed that students were equally concerned about being able to join their peer group when they select a different course modality or course section than their peer group. These concerns were more pronounced in terms of joining the peer group in the current term

followed by a future possibility, whereas the concerns of being rejected was somewhat weaker; the correlation was slightly stronger for in-person sections than course modality. Students may therefore believe that being in the same in-person section is important in maintaining their 'membership' in a peer group for in-person courses, and similar but to a lesser extent in the other modalities.

Results Summary and Discussion

Based on the data we collected, when students evaluate their course selection and course modality selection, their overall course schedule for the term has a larger influence on their course enrollment decisions, followed by the course time. Classes that start at 3 pm or later might have an effect on their course modality decision, as the percentage of students who preferred various course modalities changed for classes that start at 3 pm or later (i.e., students were more likely to indicate no modality preference for courses starting at 3 pm or later). Another potential implication for enrollment management is that for large enrollment service courses that start at 10 am and 11 am, offering an online section might be beneficial as this provides an alternative to students who need these courses but may have time conflict and/or are less willing to sign up for other class time.

Table 2. Correlation between students' concerns about peer group acceptance and students' decisions when both modalities and multiple sections are available

Concerns about peer group acceptance	Correlation (r)	
	Modality Decision	In-person Section Decision
Future possibility of not being able to join their peers' study group	0.53**	0.55**
Facing rejection from their peers	0.38**	0.47**
Might not be able to join their peer group (current term)	0.75**	0.87**

***p-values* < 0.01

In terms of attitudes towards online learning, results indicated that student attitudes towards online learning are associated with their preferences and ultimately decisions to register for an online course modality. Further research is needed to examine the factors that lead students to believe that they learn better in online classes, as well as the factors that contribute to perceived motivation when they are enrolled in online classes. Moreover, with exposure to online learning due to the COVID-19 pandemic, student perception of online learning may have changed, especially for students who had not previously taken an online course prior to participation in this study.

Even though peer influence - specifically the fear of not being able to join their peer group in the future - is correlated with modality decisions, these correlations do not appear to vary by the specific course modality. In other words, students have similar fears when they enroll in different sections and/or different modalities than their peer group. Future research is needed to identify the source of this fear. To alleviate this fear will require departmental intervention to create events or environments that allow students from the same year in a program to interact beyond class meetings.

Limitations

As none of the existing studies used a survey questionnaire to examine peer influence, we constructed a questionnaire based on the literature. The Cronbach alpha of 0.76 for the peer influence questions indicates a high internal consistency. However, to use this survey for future studies, an assessment of the validity and reliability of the questions is needed.

The data for this study was collected prior to the COVID-19 pandemic. As all students experienced remote and online learning during the pandemic, students' perceptions and attitude towards online learning might change due to their personal experience. As such, the effect of peer influence on their decision for course modality might change due to their personal experience in online learning.

Future studies comparing their perceptions and attitudes toward online learning might be insightful.

Final Thoughts

Peer influence is inevitable within any given community. In higher education, some studies have evaluated students' course modality selection based on students' motivation, self-efficacy, and their perceptions towards online learning; however, the effect of peer influence on students' course modality selections has not been examined. As more institutions are offering courses online, the effect of peer influence on students' course modality selection is worth examining, as this can impact enrollment management, as well as course offering management that can potentially affect students' graduation timelines.

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Appendix A: Survey Questions

Peer Influence Items

All questions were presented as 5-point Likert scale (strongly disagree to strongly agree), randomized within the group.

Choose the extent to which you agree or disagree with each statement.

Solicit direct peer input

1. I check the professor's teaching style with my peers who have taken this class.
2. I check the class difficulty with my peers who have taken this class.
3. My peers' experience is helpful when I make a decision in choosing what mode of course delivery.

Solicit indirect peer input

4. I check "Rate my Professor" or other similar websites to get course information and feedback on the instructors.
5. I check course information and feedback on instructors on social media.
6. I take a course because of comments I read on social media regarding the instructor.
7. I decide not to take a course because of comments I read on social media regarding the course workload.

Decision based on peer input on course features

8. I take the online class because my peers tell me that the online version is much easier than the face-to-face version.
9. I decide not to take the face-to-face class because my peers told me that the online version of the course provided more feedback on my work than the face-to-face version.
10. I decide not to take the online class because my peers tell me that the online version of the course has more homework than the face-to-face version.
11. I take the face-to-face class because my peers tell me that it is difficult to get a good grade in the online version of the course.

Conformance or imitation

12. Although I prefer to take the online version of one class, I may change my own decision to match my peers' decisions.
13. If my peers tell me that they will take the online version of one class, I will also register for the online version of this class.
14. I may register for one mode of course delivery because I want to study together with my peers.

Concern about future peer group acceptance

Mode of delivery

15. I may not be able to join their study group easily in the future.
16. I may feel "a loss of status" with my peers in the future.
17. I am concerned that I might face possible rejection from my peers in the future.

Different section

18. I may not be able to join their study group easily in the future.
19. I may feel "a loss of status" with my peers in the future.

20. I am concerned that I might face possible rejection from my peers in the future.

Perception and Attitude toward Online Learning

All questions were presented as 6-point Likert scale (Strongly disagree, disagree, somewhat disagree, somewhat agree, agree, and strongly agree).

Choose the extent to which you agree or disagree with each statement. (8 questions in total.)

1. I am motivated by the class materials for an online class more than the class materials for a face-to-face class.
2. Learning in an online class is better than learning in a face-to-face class.
3. I can work in course-assigned group work for my online class outside of the online learning system (i.e. outside of the OSU Canvas System).
4. I feel that I can improve my listening skills more through online learning than face-to-face learning.
5. I can discuss with other students in my online class outside of the online learning system (i.e. outside of the OSU Canvas System)
6. I believe that an online class is more motivating than a face-to-face class.
7. I believe a complete course can be taught online without difficulty.
8. I can form study groups with other students for my online class outside of the online learning system (i.e. outside of the OSU Canvas System).

About the Research Unit at Oregon State Ecampus

Vision

The Ecampus Research Unit strives to be leaders in the field of online higher education research through contributing new knowledge to the field, advancing research literacy, building researcher communities and guiding national conversations around actionable research in online teaching and learning.

Mission

The Ecampus Research Unit responds to and forecasts the needs and challenges of the online education field through conducting original research; fostering strategic collaborations; and creating evidence-based resources and tools that contribute to effective online teaching, learning and program administration.

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