

# Learning Online vs. Learning in Person: A Mixed-Methods Approach to Understanding How Student Preferences and Perceptions Have Evolved Since the Pandemic

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## Abstract

Undergraduate enrollment in online courses has been trending upward over the past decade, despite declining enrollment overall. With the onset of COVID-19 during the Spring 2020 semester, more undergraduates were suddenly thrust into online courses. Although learning outcomes for face-to-face and online courses may not differ, some students may not be as efficacious or self-regulated in online contexts and thus, prefer to take classes face-to-face when possible. We aimed to understand undergraduates' preferred course modality (online, face-to-face) and explored how those preferences may have changed since the COVID-19 pandemic. We also sought to determine whether students' online self-efficacy and self-regulation skills varied by their preferred modality. Undergraduates ( $N = 1034$ ) enrolled in various classes between 2019-2023 completed an online survey. Taking a convergent mixed-methods approach, we analyzed qualitative data related to reasons for their online or face-to-face preferences and quantitative data related to their self-efficacy and self-regulation for online learning. Results indicate student preferences have shifted from a clear preference for in-person classes to more equal distribution across modalities, with reasons related to perceived better support for learning, self-regulation, and need for human interaction (face-to-face) versus flexibility (online). Students' self-regulation and self-efficacy for online learning did not consistently differ across preferred modality. Instructors can use these findings to inform course design, considering how they might incorporate such benefits regardless of their course modality. Institutions might also consider how to balance students' need for flexibility but preference for face-to-face courses by implementing more hybrid options and providing various financial supports.

*Keywords:* course modality, COVID-19, self-efficacy, self-regulation, online education, higher education

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Undergraduate enrollment in online courses has been trending upward over the past decade despite declining enrollment overall. According to a recent report, the number of students studying on campus decreased by nearly 11% in the 7 years prior to the COVID-19 pandemic (from 2012 to 2019), while the number of students taking at least one online class has increased by just over 33% during this same period (Seaman & Seaman, 2020). With the onset of COVID-19 during the Spring 2020 semester, more undergraduates were suddenly thrust into online courses. Although some learners and instructors had online learning and teaching experience prior to the pandemic, others had to learn to navigate online courses quickly, as many universities increased online offerings during the 2020–21 academic year to reduce COVID-19 spread (Collier et al., 2022; UNESCO, n.d.). Since 2020, the number of undergraduates who report a preference for online or blended courses has tripled, with students who had online experiences before the pandemic more likely to indicate they would take additional online courses than those who were forced into the online space (Robert, 2022). Such results suggest that emergency online learning experiences during the pandemic may not have been positive for some students, a sentiment that has been shared by their instructors as well (Ogegbo & Tijani, 2023). Given ongoing concerns about declining enrollment, this trend toward increasing online course options is likely to continue (Seaman & Seaman, 2020). It may even be heralded as one way to increase accessibility and equitability (Smith et al., 2023).

Although systematic analysis of learning outcomes has shown little differences between face-to-face and fully online courses (see Means et al., 2013), some students may not be as efficacious or self-regulated in online contexts and, thus, prefer to take classes in a face-to-face format when possible (McPartlan et al., 2021; Tichavsky et al., 2015). Prior research has highlighted the importance of *self-efficacy* (the belief one has in their ability to be successful at a task) and *self-regulation* (how well one can set goals, stay on task, self-reflect, and self-evaluate) for student learning outcomes (e.g., Cassidy, 2012; Robbins et al., 2004; Wilson & Narayan, 2014). Research has also shown that students who have a greater sense of academic self-efficacy typically engage in more self-regulated learning (Bradley et al., 2017; Wilson & Narayan, 2014), revealing an important relationship between these two factors. Furthermore, positive self-efficacy and self-regulated behavior are reliable predictors for online course success specifically (Bradley et al., 2017; Wang et al., 2013).

In the present study, we sought to gain an understanding of how self-efficacy and self-regulation for learning in online contexts might vary for students based on their course modality preferences, as understanding such differences could provide educators with further insights into undergraduate success and guide instructors in effective course design. As the unpredicted, but necessary, move to online learning in response to the COVID-19 pandemic forced more undergraduates into online courses (Collier et al., 2022; Ogegbo & Tijani, 2023), we also explored whether students' preferred modality has changed, as such insights could shed light on potential future enrollment trends or university offerings.

## Review of the Literature

Drawing upon Bandura's (1986) social cognitive theory, we propose that contextual features of the learning environment (i.e., online or in-person modality) and students' perceptions of that environment influences their behaviors and engagement with the various learning activities taking place in that context (i.e., their self-regulation). Similarly, the learning

environment, and students' perceptions of this environment, influences their beliefs about how successful they can be in that context (i.e., self-efficacy). Such beliefs about their efficacy and self-regulation may, conversely, influence their preferences for enrolling in an online or face-to-face class.

We view the pandemic as an environmental factor that—for at least a period of time—constrained students' learning options, which subsequently may have influenced students' perceptions of the online learning modality as well as their behavior, engagement, or efficacy for learning online. Not only were student choices constrained, but also those of their instructors, who were forced into emergency remote teaching (ERT), ill-prepared for the online modality and with less assistance for redesigning their courses than they might otherwise have had (Hodges et al., 2020). For this study, we explored what aspects of the online and face-to-face modalities contributed to students' preferences for one modality over the other and whether these preferences reflected differences in their self-efficacy or self-regulation for learning in online contexts specifically.

### ***Students' Preferred Course Modality***

Prior research shows several reasons students choose to take online or in-person classes. According to the Online Education Database (Broderick, n.d.), some reasons students take online classes are flexibility, lower overall costs, a comfortable learning environment, and pacing options. Their need for flexibility has been related to time or location, such as a desire to avoid commuting, continue working, honor family obligations (Harris & Martin, 2012), and better accommodate their lifestyle (Shay & Rees, 2004). Mather and Sarkans (2018) found that older students preferred online options as it allowed them to pursue their educational goals rather than postpone additional schooling. More recent research conducted during the pandemic with college students who had no choice but to take online courses (end of the Spring 2020 and Fall 2020 semesters) reveals similar findings, as those with more work responsibilities indicated a preference for online learning—particularly if it was asynchronous in nature (Tuckel & Pok-Carabalona, 2023). By contrast, students often prefer face-to-face classes because of the interactions they can have with peers, as well as instructors, within the learning context (Minosky et al., 2022; Tichavsky et al., 2015; Tuckel & Pok-Carabalona, 2023) and are more likely to attend in-person classes that incorporate interactivity into lectures (Moores et al., 2019). Students have also referenced the lack of promptness in faculty responses when taking online courses as a reason for preferring face-to-face courses (Mather & Sarkans, 2018). To negate the lack of peer interaction in online courses, Valtonen and colleagues (2021) emphasized the need for online learning environments to incorporate collaborative activities, as this is an important way for students to develop twenty-first-century skills. Importantly, online instructors at the post-secondary level do value student engagement, and often look for ways to foster student-student and student-instructor interactions within their online classrooms, whether through asynchronous or synchronous means (Shi et al., 2023).

Importantly, even when students report they would prefer learning in face-to-face classes, they might still enroll in online courses due to the flexibility the online format provides, particularly during a summer session. As online courses can be completed from any location and require no regular campus commute, this modality provides students with the option to return home for the summer and/or work elsewhere (Santa Clara University, 2019). Students have also

reported they prefer an online learning environment that is *asynchronous* in nature, as its flexibility allows them to enroll in other required, in-person courses, hold a job, and meet other obligations outside of school while still fulfilling educational requirements (Sarooha, 2014). Consequently, such choices may be strategic, as learning outcomes (i.e., retention and attainment) for in-person classes are generally associated with actually attending class (Moore et al., 2019). Conversely, students have reported a preference for face-to-face courses primarily because they appreciate the consistent meeting schedule and frequent due date reminders, believe they “learn better” in person, and think they would feel too disconnected from others if they took courses online (Harris & Martin, 2012; Tichavsky et al., 2015).

### ***Learning Outcomes and Learner Characteristics***

As the number of online courses increases, a frequent concern is how well online learning outcomes compare with those of more traditional, in-person classes. Multiple studies have revealed conflicting results in the overall pass/fail rate between online and face-to-face courses (Atchley et al., 2013; Cavanaugh & Jacquemin, 2015; Long et al., 2023). Atchley and colleagues (2013) found there was a small, but statistically significant difference between completion rates for full semester courses at a small, public, comprehensive university in the southwest U.S., with traditional face-to-face students more frequently completing the course. Furthermore, they noted that online courses had higher frequencies of As, Ds, and Fs compared to in-person courses. By contrast, Paul and Jefferson (2019) found no statistically significant difference in student performance between online and face-to-face sections of an environmental science class for non-STEM majors, regardless of gender or class rank. Wells and co-researchers (2022) also found no significant differences in learning outcomes (i.e., exams, final grades, collaborative project scores) for biology majors in a writing-intensive course despite the ERT conditions under which the online course had been developed. In their study of thousands of courses taught over three years at a large, four-year public university in the U.S. Midwest, Cavanaugh and Jacquemin (2015) noted that although students with higher GPAs were successful in online courses, those with lower GPAs performed worse in online courses than they did in face-to-face courses. More recently, Long and co-authors (2023) have further explored differences in performance outcomes at the university level and found that institutional affiliation (e.g., degree-seeking or non-degree seeking) and overall modality enrollment (i.e., whether enrolled exclusively in online or face-to-face courses, or a mix of both) were relevant factors, with affiliated students (e.g., degree-seeking) and those enrolled in at least some face-to-face classes being most likely to earn a final grade of C or higher in their economics courses.

In addition to performance outcomes, some researchers have explored how students’ perspectives vary across modalities. For example, Stover and colleagues (2024) determined that although undergraduates’ STEM perspectives increased from pre to post assessment across modalities, in-person research experiences led to higher efficacy, identity, and belonging than virtual research experiences. However, as these authors note the virtual experience was created in response to COVID-19, ERT-related issues may have contributed to such differences. Contributing to such inconsistent results is a lack of experimental studies that include randomized assignment to each modality. As learning outcomes are often related to student motivation, the fact that college students in online courses report lower levels of motivation than face-to-face students (Stark, 2019) is worth further investigation. Recognizing that—when given a choice—college students prefer to take classes they perceive as important face-to-face while

opting for online when it is less important (Jaggars, 2014), McPartlan and co-authors (2021) argued the need to consider student motivation for enrolling in a certain modality when making such outcome comparisons. Framing motivation using expectancy-value theory, they found that student expectations for their end-of-course grade did not vary by modality, though they did find that students taking online classes indicated they would be satisfied with a lower final grade than those in face-to-face classes (McPartlan et al., 2021).

Others have also argued the need to consider individual characteristics, demonstrating how such personal factors are related to modality preferences. Indeed, prior research has revealed that students who have previous experiences in online courses and were successful in them were more likely to feel they had the necessary skills to be successful in *future* online courses (Bradley et al., 2017; Wang et al., 2013), indicating that self-efficacy for online courses increases over time for those who feel successful in their online learning experiences. Relatedly, undergraduates with higher efficacy for online learning are more likely to choose online courses (Artino, 2010). Given undergraduates who have taken at least two online courses have higher self-efficacy beliefs regarding their performance in these classes than students who have taken one or fewer online courses (Alghamdi et al., 2020), one possible silver lining to the pandemic could be that today's college students have efficacy for the online modality. As research conducted with a diverse, international sample at the height of the pandemic (Spring 2021) classified nearly two-thirds of participants as having "low" academic self-efficacy (Chaleil et al., 2024), the question of whether this possibility has come to fruition remains open. Importantly, students with a greater sense of self-efficacy engage in self-regulated learning more than those with lower self-efficacy (Wilson & Narayan, 2014), a relationship that holds true for internet self-efficacy specifically in e-learning contexts (Gupta & Bamel, 2023). When students are more self-regulated, they are more likely to earn better grades and matriculate through college (Cassidy, 2012).

Although students' perception of online learning positively and significantly affects their online learning readiness, these perceptions are not necessarily a significant predictor of performance (Wei & Chou, 2020). It is also worth noting that self-regulation skills might transfer from one context to another (e.g., from face-to-face to online), as students transitioning from high school to college have demonstrated an ability to adapt to new learning contexts (Gomez et al., 2022). Students in both online and face-to-face courses have recognized the need for self-regulatory skills to be successful in an online learning context (Barak et al., 2016; Tichavsky et al., 2015), and yet those enrolled exclusively in online classes can be less confident in their abilities (Long et al., 2023). Furthermore, self-regulation skills may be even more critical to online learning success, as learners do not have face-to-face interactions with peers or instructors who might help direct self-regulation (i.e., peers asking questions in class or instructor references to upcoming assignments), forcing them to rely on their own skills. Like self-efficacy, students with more experience taking online courses perceive themselves as more self-regulated online learners (Alghamdi et al., 2020); however, those who report feeling they are poor self-motivators might not have the skills needed for self-regulation (Tichavsky et al., 2015).

According to a recent meta-analysis (Castro & Tumibay, 2019), student experiences in online courses largely depends on their engagement in course assignments and activities, self-efficacy, and motivation to engage in the courses productively. Furthermore, students with high self-regulation and self-efficacy are more engaged and, subsequently, more successful in online

courses (Kaspar et al., 2023), which aligns with long-standing research in face-to-face learning contexts (e.g., Linnenbrink & Pintrich, 2003). Thus, research points to the potential for comparable learning outcomes for online and face-to-face contexts overall, with the understanding that student self-efficacy and self-regulation skills are contributing factors to those outcomes.

### *The Present Study*

The intent of this study was to explore whether students' preferences for online or face-to-face courses had changed since the onset of COVID-19 forced many students into fully online courses, despite their preferences. Given online experiences were necessarily involuntary for some students, we wondered whether students' more recent perceptions of their ability to learn online might differ according to their preferred course modality. Thus, the research questions guiding this study included:

**RQ1:** Have students' course modality preferences (face-to-face or online) changed over time (2019–2023)?

**RQ2:** Have students' reasons for their preferred modality changed during this time period and if so, how?

**RQ3:** To what extent do students' perceptions of their academic self-efficacy and self-regulation skills for online learning vary based on their preferred modality?

## **Methods**

To answer these research questions, we took a convergent mixed-methods approach using a convenience sample. We acknowledge that some have criticized psychology researchers for over-relying on convenience samples of university students, raising questions about the degree to which results can be applied to the population at large (Novielli et al., 2023). In this study, however, our convenience sample was well-suited to the population of interest (i.e., university students). Given the nature of our research questions, qualitative and quantitative data provided a more holistic understanding of the various factors influencing students' choices (Hitchcock & Davis, 2023). Specifically, the pandemic's disruptions created a unique context for studying students' enrollment decisions, and thus we chose not to limit their responses with a list of pre-determined list reasons but instead asked them to provide their rationale (i.e., requiring qualitative data). However, as self-efficacy and self-regulation skills are psychological constructs with a large body of research, we were able to identify a valid and reliable instrument for capturing these factors quantitatively and later situate the findings within the larger corpus of self-efficacy/self-regulation literature. As neither the qualitative or quantitative data informed our collection of the other and we required both data sets for each participant, data collection occurred in parallel, was analyzed separately, and then integrated during interpretation to explain the changes that occurred across time (Creswell & Clark, 2018).

### *Participants/Context*

Upon approval from the Institutional Review Board (IRB #ED-18-104-OFF) we recruited participants from a large university located in the Midwest. All participants were enrolled in one of 10 different undergraduate, educational psychology courses during the spring semester from 2019–2023. Although all courses were offered online, three of these courses also had face-to-face sections, allowing students to register for either a fully online, asynchronous format or fully face-to-face course during the enrollment period. Due to COVID-19, during the Spring 2020 semester (after spring break) and for the entire Spring 2021 and 2022 semesters, the face-to-face course options were moved to a synchronous online modality with class meetings held via Zoom. Given asynchronous online options for each of these courses existed pre-pandemic, and the educational psychology program had been using the Community of Inquiry (see Swan et al., 2009) as its instructional framework for online course design for several years, these instructors were familiar with the importance of fostering cognitive, teaching, and social presence in the online space. Consequently, these specific classes may not have represented the more unique conditions ERT presented at this time (Hodges et al., 2022), though instructors may still have struggled to seamlessly adapt to the synchronous (rather than asynchronous) online context.

Every student enrolled in one of these courses was required to take an online survey that included multiple scales related to instruction, motivation, and learning experiences, which provided the Educational Psychology program with formative feedback they could use for course improvements. Upon completion of the survey, students were asked for their consent to use their survey responses for research purposes. All students who completed the survey received course credit equal to 1% of their final grade, regardless of whether they granted consent. Upon removal of any duplicate students (i.e., students enrolled in multiple courses) and those who did not consent, our final sample size was  $n = 1034$ , representing a response rate of over 50% overall. Of those who consented and completed the demographic questions, most respondents were between the ages of 18 to 22 (73%), identified as female (75%), White (66%), and were classified as either a junior or senior (64%), reflecting much of the overall population in these courses. See Table 1 for full demographic data.

### *Measures*

Data for this study was collected as part of a large programmatic survey administered in the second half of each semester (weeks 12–14) that included multiple validated scales related to student beliefs, instruction, and various motivational constructs. For the purposes of this study, we focused on items related to students' preferred modality (one forced-choice response), the rationale for their modality preference (one open-ended question), and their self-efficacy and self-regulation for learning in online contexts (23 Likert items) that we explain in greater detail next.

**Table 1**  
*Sample Demographics by Semester*

	Spring 2019 <i>n</i> = 214	Spring 2020 <i>n</i> = 208	Spring 2021 <i>n</i> = 205	Spring 2022 <i>n</i> = 205	Spring 2023 <i>n</i> = 202
<b>Academic Standing</b>					
Freshman	11 (5.1%)	5 (2.4%)	12 (5.9%)	4 (2.0%)	16 (7.9%)
Sophomore	47 (22.0%)	45 (21.6%)	61 (29.8%)	43 (21.0%)	50 (24.8%)
Junior	56 (26.2%)	68 (32.7%)	77 (37.6%)	86 (42.0%)	80 (39.6%)
Senior	52 (24.8%)	58 (27.9%)	55 (26.8%)	72 (53.1%)	56 (27.7%)
<b>Age</b>					
18–22	137 (64.0%)	147 (84.0%)	168 (84.4%)	160 (78.1%)	141 (69.8%)
23 and older	29 (13.6%)	12 (5.8%)	31 (15.6%)	39 (19.0%)	39 (19.3%)
Prefer not to answer	1 (0.5%)	1 (0.5%)	6 (2.9%)	6 (2.9%)	22 (10.9%)
<b>Gender</b>					
Male	39 (18.2%)	32 (15.4%)	45 (22.0%)	28 (13.7%)	21 (10.4%)
Female	128 (59.8%)	142 (68.3%)	159 (77.6%)	174 (84.9%)	177 (87.6%)
Non-binary/prefer not to answer	0 (0%)	2 (1%)	1(0.5%)	3 (1.5%)	4 (2.0%)
<b>Race/Ethnicity</b>					
White	109 (50.9%)	123 (59.1%)	147 (71.7%)	145 (70.7%)	154 (76.2%)
Black	11 (5.1%)	8 (3.8%)	17 (8.3%)	11 (5.4%)	4 (2.0%)
Hispanic/Latino/a/x	11 (5.1%)	5 (2.4%)	13 (6.3%)	19 (9.3%)	14 (6.9%)
Native American	11 (5.1%)	14 (6.7%)	15 (7.3%)	17 (8.3%)	21 (10.4%)
Asian Am/Pacific Islander	3 (1.4%)	2 (1%)	5 (2.4%)	1 (.5%)	3 (1.5%)
Multiracial/Other	14 (6.5%)	20 (9.8%)	6 (2.9%)	8 (3.9%)	3 (1.5%)
Prefer not to answer	8 (3.7%)	4 (1.9%)	1 (0.5%)	2 (1.0%)	1 (0.5%)
<b>Major</b>					
Education	86 (40.2%)	80 (38.5%)	76 (37.1%)	56 (27.4%)	79 (37.6%)
Psychology	30 (14.0%)	36 (17.3%)	47 (22.9%)	63 (30.7)	46 (21.9%)
Comm. Sciences	16 (7.5%)	24 (11.5%)	23 (11.2%)	22 (10.7%)	30 (14.3%)
Rec Mgmt/Therapy	11 (5.1%)	6 (3.0%)	10 (4.9%)	8 (3.9%)	3 (1.4%)
Other	25 (11.7%)	31 (15.4%)	49 (23.9%)	54 (26.3%)	51 (24.2%)
Cumulative GPA <i>m(sd)</i>	3.24 (0.52)	3.37 (0.15)	3.39 (0.46)	3.42 (0.45)	3.46 (0.44)
Missing Data	47 (22.0%)	32 (15.4%)	0 (0%)	0 (0%)	0 (0%)

*Note.* Due to demographic data initially being gathered via another programmatic survey distributed at the beginning of the Spring 2019 and 2020 semesters, all demographic information for participants who did not complete the initial survey was considered “missing” for these reporting purposes.

### Course Modality Preference

Each survey participant ( $N = 1034$ ) was asked, “*If given a choice, would you prefer to take class face-to-face or online?*” and provided three possible responses: online ( $n = 372$ ), face-to-face ( $n = 461$ ), and no preference ( $n = 201$ ). Responses to this question were analyzed using chi-square to determine if any statistical changes could be observed across semesters by preferred format (RQ1).

Participants were then asked to explain why this format was their preference and provided with an open text box. Through an iterative process of open and axial coding (Corbin & Strauss, 2008), both authors initially read all participant-generated responses and identified



possible codes. As our primary goal at this time was to identify potential codes, we did this without regard to the participants' preferred modality or the semester in which they completed the survey. We then tried to apply these codes to a subset of 20 participant responses. Following a thematic analysis process (Braun & Clark, 2006), we identified a need to collapse some codes into overarching themes that could be more clearly defined and better delineated from others. This iterative process continued with additional subsets of 15–20 responses until we reached 80% agreement. We then divided the remaining responses for coding, reconvening to discuss any specific responses that were questionable before assigning a final code to ensure credibility of our findings. Once all responses had been coded, we tabulated the number of responses that received each code by format for each semester and reviewed results for any trends in the data (RQ2). We provide exemplars of our final themes throughout the results, presenting participants' responses exactly as stated, to support the credibility of these findings (Corbin & Strauss, 2008).

### Self-efficacy and Self-regulation in Online Learning

To evaluate whether self-efficacy and self-regulation for online learning varied according to course modality preferences, the Online Academic Success Indicators Scale (OASIS; Bradley et al., 2017) was added to the program survey during the 2020–21 academic year. This scale (23 items) includes two subscales using a 7-point Likert scale (1 = not confident, 7 = very confident). In their study of the influence of self-efficacy and self-regulation in online learning, Bradley and her colleagues (2017) demonstrated the OASIS subscales to be highly reliable ( $\alpha = .88 - .91$ ) and strongly correlated with previously established measures used in traditional and online learning contexts, validating its use as an effective tool for measuring these skills in the online environment. One subscale measured students' sense of self-efficacy ( $\alpha = .93$ ), asking them to rate how confident they are that they can do certain things within an online class, such as *learn the material presented in an online class* or *communicate/network with classmates via discussion boards*. The other subscale measured student perceptions of their ability to self-regulate in an online class ( $\alpha = .90$ ), asking them to indicate their level of confidence that they could successfully do such things as *ask for help from your online teacher* or *eliminate distractions that interfere with a suitable learning environment*. A mean score was computed for each subscale and analyzed using MANOVA (RQ3).

## Results

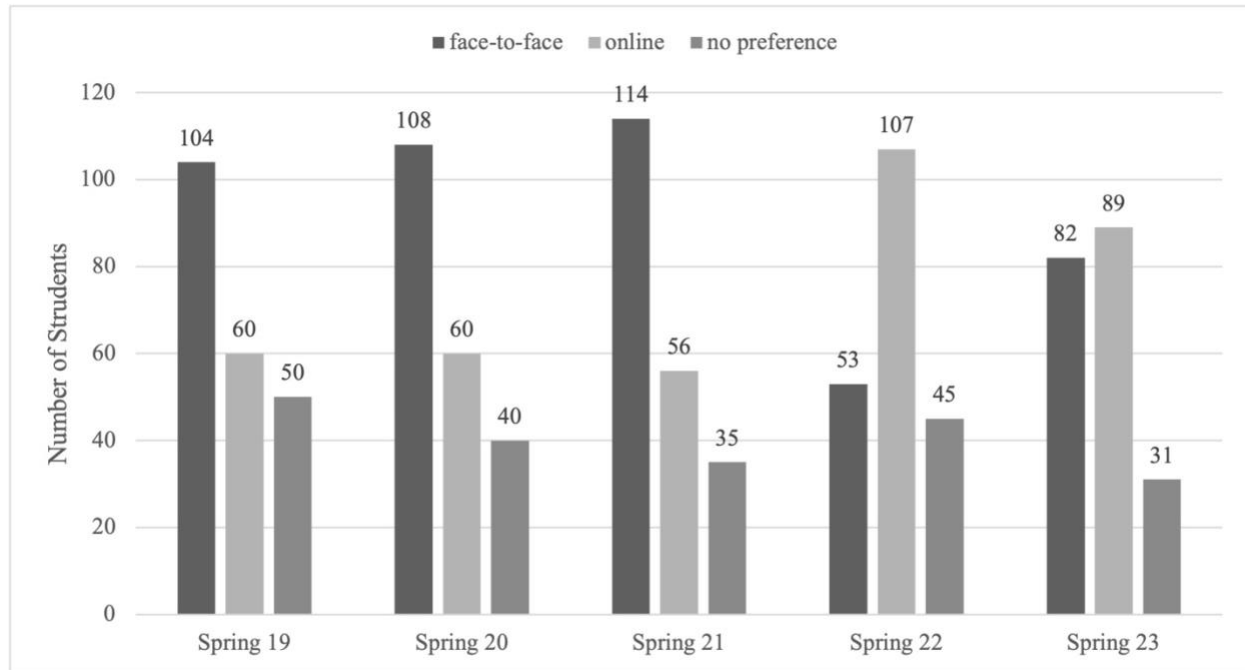
Taking a convergent mixed-methods approach to data analysis (Creswell & Clark, 2018), we organize our results according to our three research questions.

### *Students' Course Modality Preferences are Evolving*

Participant responses to the initial question of which modality they preferred (online, face-to-face, no preference) revealed statistically significant changes across these five semesters,  $\chi^2(8, N = 1034), 60.044, p < .001$ . As shown in Figure 1, students appeared to maintain a clear preference for face-to-face classes by a 2:1 margin from Spring 2019 to Spring 2021. However, Spring 2022 revealed a clear shift in student preferences for the online format by nearly the same 2:1 margin. In Spring 2023, student preferences shifted once again, with nearly equal numbers of students indicating a preference for online or face-to-face courses. Overall, students with no

preference for one format over the other varied slightly, ranging from a high of 50 (23%) in Spring 2019 to a low of 31 (15%) in Spring 2023.

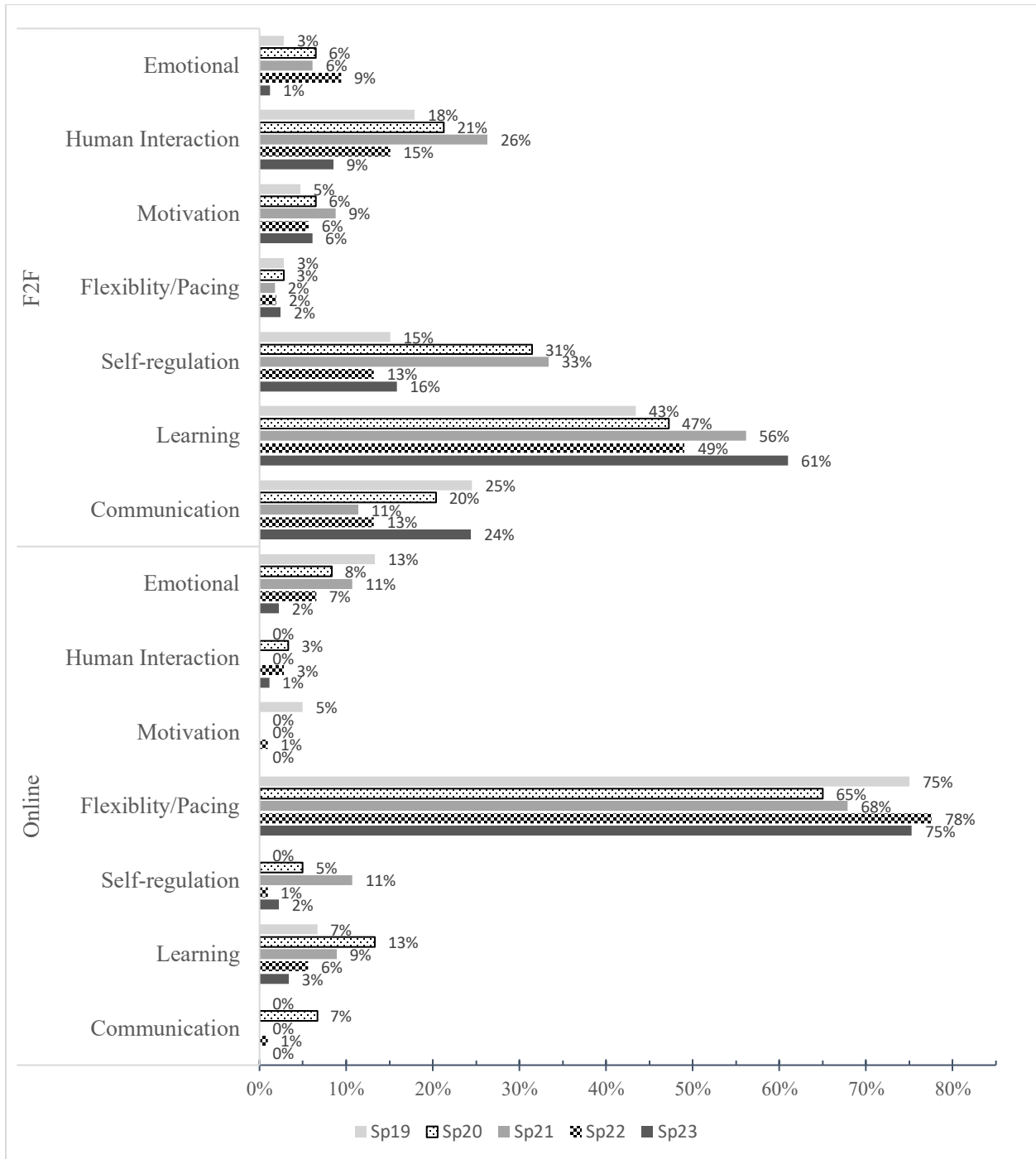
**Figure 1**  
*Course Modality Preferences by Semester*



***Rationales for Preferred Modality Vary by Context, but are (Mostly) Consistent over Time***

To gain further insights into students' preferences, we analyzed their responses to the open-ended, follow-up question asking "why" this modality was preferred. Based on a content analysis of all student responses, we identified seven major themes: (a) *communication*, indicating the format supported their efforts to seek clarification, receive timely feedback, or have an authentic class discussion with others; (b) *learning*, indicating they felt they learned "better" in one context over the other; (c) *self-regulation*, revealing perceptions that one modality better supported such skills as time management, focus/concentration, on-task behavior, and on-time assignment submissions; (d) *flexibility/pacing*, noting how well the modality accommodated their busy schedules or enabled them to move through content at their own pace; (e) *motivation*, indicating they felt more motivated to engage or participate in a certain class context; (f) *human interaction*, indicating the modality better allowed them to engage with other people in meaningful ways and experience a sense of community; and (g) *emotional*, often referencing a "like" or "dislike" for a particular modality. Notably, we initially created a *COVID* code to apply to responses referencing the pandemic; however, as only eight responses received this code, we removed it from future analyses. We then sorted coded responses by preferred modality and semester to explore whether any thematic patterns emerged based on the frequency of these codes (Figure 2). As participants who indicated "no preference" for either modality most often provided either no rationale or stated, "it depends" (sometimes specifying it depended either on the course content or the instructor), we did not explore the "no preference" group's data further for this question.

**Figure 2**  
*Percent of Student Responses Coded for Each Reason by Preferred Modality and Semester*



Note. Totals for each semester/modality may not equal 100% because a response could receive multiple codes.

Notably, students who preferred online courses most frequently indicated the modality’s flexibility allowed them to accommodate their work schedules or family obligations (e.g., *I have a full time job and child I have to work around*). They also noted that the flexibility that came with online courses allowed them to work through course material at their own pace, speeding up

when possible (*It helps me save time for other classes because this usually is not as challenging*) and slowing down as needed (*I can dive as deep into the topic as I want on my own time*). The need for flexibility also referred to convenience (*I like learning on my couch*), location (*online is extremely helpful because you can do the work from wherever*), and lifestyle (*I like being able to do the work on my own time without having to waste time in class*). By contrast, flexibility was rarely mentioned by those who preferred face-to-face courses.

Unlike the online group, which coalesced around one primary reason for their preference, several reasons for preferring face-to-face courses emerged. Specifically, participants most frequently noted the face-to-face modality better supported their learning (*it's easier for me to actually retain information and pay attention*) and self-regulation (*it's very hard for me to discipline myself when taking courses online*). These students also frequently indicated they felt the in-person modality better facilitated communication (*it allows you to ask questions and receive immediate feedback from peers and professors*). Furthermore, their desire for human connection and the opportunity to engage with others via a face-to-face context (*I prefer being on campus and creating a sense of community with my classmates*) was noted with increasing frequency over the first three years and decreasing frequency over the last two.

In looking *across* course formats, we noted that although communication—or the desire to communicate with their peers/teachers in order to receive clarification or timely feedback—was generally noted with *decreasing* frequency across time in the face-to-face context (with the exception of Spring 2023), it primarily appeared as a rationale for online courses during Spring 2020 (the semester that all courses shifted abruptly online in response to COVID-19). Human interaction was another code that appeared rarely for those who preferred the online context; however, those who preferred a face-to-face context acknowledged its importance with *increasing* frequency for the first three years. Although self-regulation was noted more frequently by those who indicated a preference for a face-to-face modality, it was noted by both groups with increasing frequency during the first three years, before returning to levels similar to the first year.

To determine whether the changes we saw over time in students' reasons for their preferences reflected significant differences, we conducted a chi-square test of independence, examining the relation between semester and frequency for each code by preferred modality (Table 2). For those who indicated they preferred online classes (and met the minimum threshold of no less than 5 per cell), no significant differences were found. However, for those who preferred face-to-face classes, the importance of self-regulation showed a significant increase during the Spring 2020 and 2021 semesters (peek Covid response time),  $\chi^2(4, N = 463), 20.18, p < .001$ . Likewise, human interaction was referenced more frequently in the first three semesters,  $\chi^2(4, N = 463), 10.95, p = .027$ .

**Table 2**  
*Frequency of Code by Preference Across Semesters*

Code	Prefer Online					Prefer Face-to-Face				
	Spr19	Spr20	Spr21	Spr22	Spr23	Spr19	Spr20	Spr21	Spr22	Spr23
Communication	0	4	0	1	0	26	22	13	7	20
Learning	4	8	5	6	3	46	51	64	26	50
Self-regulation	0	3	6	1	2	<b>16</b>	<b>34</b>	<b>38</b>	<b>7</b>	<b>13</b>
Flexibility/Pace	45	39	38	83	67	3	3	2	1	2
Motivation	3	0	0	1	0	5	7	10	3	5
Human Interact	0	2	0	3	1	<b>19</b>	<b>23</b>	<b>30</b>	<b>8</b>	<b>7</b>
Emotional	8	5	6	7	2	3	7	7	5	1

*Note.* Bold numbers indicate  $\chi^2$  was statistically significant at  $p < .05$ .

Collectively, these findings better explain why we found significant differences in students' course modality preferences across semesters in RQ1. It seems the need for flexibility is paramount for those who prefer online classes, whereas the perception that face-to-face classes are more supportive of self-regulation and foster human interactions is seen as less critical. Overall, however, students' underlying reasons for preferring online or in-person courses appear to be consistent over these five years.

### *Self-efficacy and Self-regulation for Online Learning Varies*

As we collected data on the OASIS scales starting in Spring 2021, this analysis reflects only the last three years (Spring 2021-23) of the current study (see Table 3 for descriptives). We had hypothesized that students who preferred online classes would have higher scores on each of the OASIS subscales. To determine whether self-efficacy and self-regulation varied by preference, we originally ran a two-way MANOVA (3 semesters X 3 formats). However, we noted the data violated several assumptions. As our research question did not include a semester X format interaction, we decided to run three one-way MANOVAs, separating data by semester.

**Table 3**  
*Means and (Standard Deviations) for OASIS Subscales by Preference and Semester*

Format	<i>n</i>			Spring 21		Spring 22		Spring 23	
	Spr21	Spr22	Spr23	SR	SE	SR	SE	SR	SE
Face-to-Face	114	53	82	5.39 (1.10)	6.06 (0.85)	5.53 (1.07)	6.23 (0.65)	5.00 <sup>a</sup> (1.31)	5.72 <sup>c</sup> (1.02)
Online	56	107	89	5.49 (1.16)	6.06 (1.01)	5.92 (0.96)	6.31 (0.93)	5.92 <sup>b</sup> (0.99)	6.36 <sup>d</sup> (0.79)
No Preference	35	45	31	5.17 (1.15)	5.84 (1.06)	5.69 (1.09)	6.31 (0.68)	6.16 <sup>b</sup> (0.88)	6.36 <sup>d</sup> (0.83)

SR = Self-regulation; SE = Self-efficacy

*Note.* Letters indicate group means that were significantly different for each subscale.

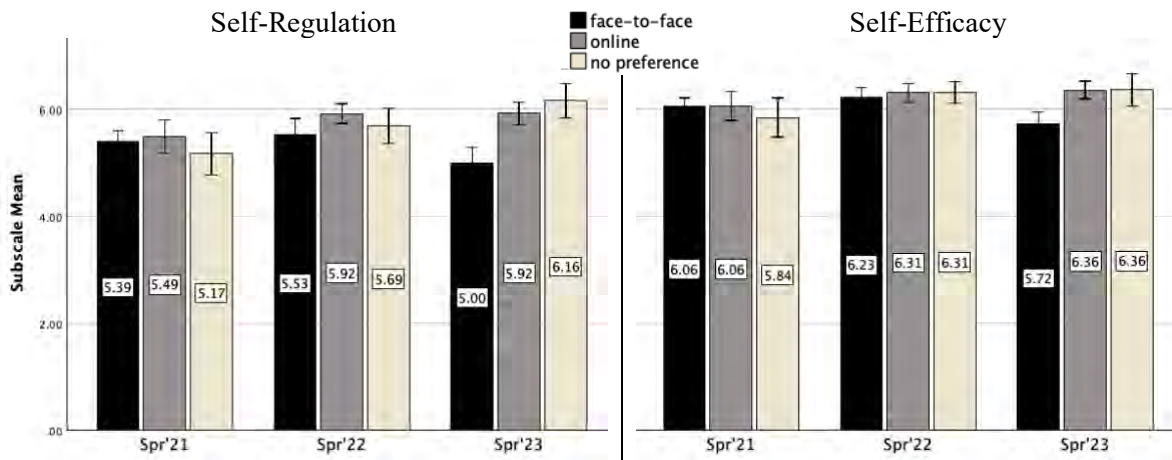
Notably, analyses revealed different results across the three semesters. Contrary to our hypothesis, during the Spring 2021 semester, there were no significant differences,  $F(4, 402) =$

0.631,  $p = .641$ ; Wilks'  $\Lambda = .988$ . During the Spring 2022 semester, we noted Box's M was significant, but Levene's was not. Upon further review of the between-subjects effects, we again found no significant differences for either students' self-efficacy for online learning,  $F(2, 202) = 0.21, p = .815, \eta^2 = .002$ , or their online self-regulation,  $F(2, 202) = 2.67, p = .072, \eta^2 = .026$ .

For Spring 2023, we noted both Box's M and Levene's were significant, indicating we did not meet either assumption. Therefore, we chose to run separate one-way ANOVAs and use the more conservative *Welch's F* test. These analyses revealed significant differences across groups for both self-efficacy,  $F(2, 84.35) = 11.38, p < .001, \omega^2 = .103$ , and self-regulation,  $F(2, 90.58) = 18.08, p < .001, \omega^2 = .155$ . Post-hoc Games-Howell analyses revealed those who prefer face-to-face classes were significantly lower on each of these subscales than those who preferred online courses or had no preference. There were no significant differences between those who preferred online courses and those who had no preference.

Although our data violated assumptions for a two-way MANOVA (with a semester X format interaction), these results caused us to question how students' perceptions of their self-efficacy and self-regulation for online learning have collectively changed over time. Visual representation of the data reveals some interesting trends worth further consideration (Figure 3). Notably, students who prefer face-to-face classes are trending towards less efficacy and self-regulation for online learning, whereas those who indicate they have no preference appear to be increasing in these two qualities. Those who prefer online classes have reported somewhat higher efficacy and self-regulation since Spring 2021 (when many might still have been adapting to the pandemic's push into online spaces), with levels appearing relatively consistent since.

**Figure 3**  
*OASIS Subscales by Modality Preference for Spring 2021–23 Semesters*



Note. Error bars indicate 95% CI.

## Discussion

With enrollment in higher education declining while enrollment in online courses is increasing, understanding current factors that may contribute to students' enrollment decisions in a post-pandemic world is timely. Guided by social cognitive theory, we initially anticipated students' collective preferences for one modality over the other might change over time, as the

learning environments became constrained to the online context, though we were uncertain what perceptions of the environment might become most salient and subsequently influence their efficacy for learning and self-regulation in that context. Specifically, we were not sure whether a preference for face-to-face classes would increase (as the pandemic led to a greater appreciation for learning in person) or decrease (as once-reluctant online learners discovered the online context was better than expected). What these results show is that students' preferences have, indeed, changed, though perhaps in ways that are unsurprising. The 2:1 preference for the face-to-face modality during the initial three years of this study aligns with prior research revealing that more students prefer face-to-face classes (Gherheş et al., 2021), which is associated with a desire for human interaction (Harris & Martin, 2012, McPartlin et al., 2021). Like others (e.g., Tuckel & Pok-Carabalona, 2023), we see this as an indication that students perceived online environments as less conducive to engaging with other people, a quality they felt was important for their learning experiences. Further, as other studies have revealed that students who have previously taken an online course prefer online courses more frequently than those who have not (e.g., Robert, 2022; Tichavsky et al., 2015), that students' preferences for online classes increased dramatically in Spring 2022—after most students would have necessarily resorted to online classes for several semesters if they wanted to maintain progress—might also be expected, particularly if their instructors had been adept at fostering peer-to-peer or student-instructor engagement within the online context.

However, the final year of data collection revealing another shift in modality preferences—to near equal numbers of students indicating a preference for online as face-to-face—does raise some questions about future enrollment trends. Further review of students' reasons for these preferences, and how those reasons have changed *over time*, revealed that much has remained largely the same—with two key exceptions. One, the need for human interaction was noticeably less frequent in the last two years. As these results seem to contradict the relatively recent findings by McPartlan et al. (2021), who found that students who preferred face-to-face courses specifically referenced a desire for peer and professor interaction, this change is noteworthy. Although the reasons behind such a decrease are unclear, one possible explanation is a post-pandemic reality that has allowed students to re-engage with others in contexts beyond traditional classroom walls (e.g., online Zoom rooms), providing them with other ways to fulfill their need for human interaction. Such an explanation aligns with Long et al.'s (2023) argument that students more closely affiliated with the institution (i.e., admitted, degree-seeking students enrolled in at least some face-to-face classes) have greater access to campus resources and engagement with campus activities than their less-affiliated counterparts. Admittedly, another explanation could be a shift in online course design as instructors have learned how to better foster online collaborative discourse, student interactions, and overall engagement, something previous researchers found particularly challenging for instructors (Ogegbo & Tijani, 2023). Although the courses involved in this study were embedded within a program that was well-prepared for the abrupt shift to the online modality, students represented diverse majors and are often enrolled in classes from across campus. Student perceptions of the online learning environment may well have been informed by their experiences across courses that semester, taught by instructors who have been adapting from ERT to Sustained Remote Teaching (SRT) at various rates of success (Stewart et al., 2022).

The second exception was that the number of students indicating face-to-face classes were preferable for self-regulation purposes varied significantly over these five semesters. The

significant increase in Spring 2020 and the significant decrease in Spring 2022, followed by the final semester (Spring 2023) returning to a level like that of the first semester is interesting, but not well-explained by this qualitative data. Social cognitive theory, alongside quantitative results from the OASIS scales offer a possible explanation. Though we were surprised to see significant differences in only one year, that the lowest mean scores for self-regulation are by those who prefer face-to-face classes in Spring 2023 could reflect what Stewart and co-authors (2022) described as a shift from ERT to SRT. Perhaps the synchronous online options that some students were engaged in or the speed with which some courses moved online in Spring 2020 and 2021 left some students with skewed impressions of what online learning entailed, as instructors scrambled to adjust their in-person classes to the online modality without hampering students' progress too much. Over time, as instructors learned how to design more effective online courses and their expectations rose, students might have gained a better understanding of what the online modality entails. If instructor expectations for their online students changed, student perceptions of their ability to be successful in the online environment may also have changed, leading to the significantly lower scores we eventually see on these subscales for those students who prefer the face-to-face modality. Further, as more students experience online courses, they are better informed about what the online modality entails; allowing them to better identify the skills needed to succeed in this type of learning environment. That a recent study revealed college students taking online courses in Spring 2021 recognized the importance of self-directed engagement strategies (Turk et al., 2024) would seem to indicate that today's online students are developing this awareness. Coupled with other relatively recent studies have revealed students often believe face-to-face courses better support self-regulation (e.g., McPartlan et al., 2021) provides further validation for the theoretical relationship between student perceptions of the environment and their behavior, engagement, and efficacy (Bandura, 1986).

### ***Limitations and Future Research***

There are certain limitations to this study worth noting. First, data was collected from only one campus. While the sample size is large and participant demographics are representative of overall enrollment in these courses, generalizability to the post-secondary population is tenuous. Future researchers might replicate this study across multiple campuses to include greater diversity, as results may vary if more diverse online learning experiences and/or online instructional design approaches are included.

Second, as OASIS data was only collected during the final three years to understand better the potential effects of the lingering pandemic on student efficacy and self-regulation, comparisons are limited. Furthermore, items in both subscales were preceded by the prompt "how confident are you that you could successfully..." which elicits students' self-efficacy for self-regulation skills rather than their asking them to report on their actual self-regulation skills. As prior research has revealed that self-efficacy for online courses increases with experience in online classes (Bradley et al., 2017; Wang et al., 2013), the fact that we found a discrepancy across groups only in 2023 is curious and warrants further investigation. With several of the individual items on the OASIS scale no longer unique to the online learning context and instructors leveraging online tools in their learning management system for their in-person classes, items that ask students how confident they are about their ability to successfully *compose an email* or *upload an assignment* may require some revision. Researchers who want to



continue exploring these constructs might look for an instrument that better reflects today's unique features of online learning environments and asks students to report on their self-regulation behaviors (rather than confidence in their ability to engage in those behaviors), particularly if they are interested in making comparisons across course modalities.

Third, we must acknowledge that synchronous online classes present a unique learning context that has been understudied. Although it shares some qualities with traditional, face-to-face classes in that students have opportunities to engage with their peers and the instructor in real time, the computer-mediated nature of those interactions is not necessarily the same as those that might occur in real life. Similarly, synchronous online classes share certain characteristics with asynchronous online classes (e.g., increased accessibility across geographical location, less commute time), receiving immediate feedback or clarification is more likely in the synchronous context. Given our data collection process preceded the pandemic, and the synchronous online format became an alternative during semesters in which COVID warranted it, we did not specify whether the online modality was synchronous or asynchronous in the survey item regarding their preferred modality. As some students were taking synchronous online classes at the time, these experiences may have influenced these preferences in ways our survey was unable to capture. However, we also note that student responses to our open-ended items did not delineate these two online contexts or reference the unique nature of the newly offered synchronous online setting. Perhaps this lack of differentiation reflects the perception that synchronous online classes were an ERT option that would not be sustained over time. Should hybrid options continue, further distinctions between online classes that are held asynchronously versus synchronously might also need to be considered in future studies.

### ***Implications and Conclusion***

Even with such acknowledgment of the benefits that come with in-person courses, online enrollment continues to be on the rise (Seaman & Seaman, 2020). Whether this is the result of students' need for flexibility outweighing such perceived advantages or post-secondary institutions increasing online offerings (at the expense of in-person options) remains unclear. As Smith and his colleagues (2023) have reported, the number of exclusively online undergraduate students has been on the rise at four-year universities since 2012, particularly at non-profit, public institutions. Although some have applauded such increased online offerings for providing greater accessibility, their study further revealed these students have lower retention/graduation rates and poorer loan repayment progress (even though they may have accumulated less debt overall). Furthermore, these fully online programs often enroll a greater number of students who are Black and Pell grant recipients, leading to questions about whether such fully online programs might not be predatory toward certain marginalized groups (Smith et al., 2023).

Thus, rather than focusing on how to increase accessibility by providing online courses to accommodate students' needs for flexibility, post-secondary institutions seeking to continue serving an increasingly diverse student population might also consider other ways to alleviate barriers to attending face-to-face classes. Additionally, given the many reasons students gave for preferring in-person classes, post-secondary educators might also consider how they can better satisfy such needs within the online context. Our qualitative findings provide some evidence to suggest that students no longer perceive human interaction in face-to-face courses to be as

prominent in their rationale as it once was. Perhaps online instructors have become more effective at meeting such needs.

In many ways, the results of this study align with previous findings: students prefer online classes for their flexibility and find face-to-face classes provide better opportunities for interaction with others and support for self-regulated learning. Although others have argued that such needs may vary based on individual factors, such as age, institutional affiliation, and gender (Long et al., 2023), studies conducted during the height of the pandemic have revealed institutional actions may contribute to improved academic self-efficacy (e.g., Chaleil et al., 2024). Thus, when both options remain available to decision-makers, reassessing the goals we have for students might help us select the course modality (Stover et al., 2024), with online instruction a particularly viable alternative for certain types of courses (Wells et al., 2022).

Fortunately, instructors can (and should) look for ways to address these needs in their courses—regardless of the modality—for all students. Online classes can be designed in ways that foster connections with peers/instructors through thoughtfully crafted interactions (Shi et al., 2023); online learning platforms have tools that foster clear communication and timely feedback, ultimately supporting students' self-regulation. Similarly, traditional in-person classes might shift towards a hybrid format that provides students with the flexibility they need to continue pursuing their post-secondary studies. In a hybrid model, rather than require a 3-credit hour class to meet three hours/week, class time might be split into synchronous and asynchronous activities, which would require students to attend class physically less often but engage with asynchronous activities throughout the week. Finally, as many students report needing flexibility due to work and family obligations, it would also be wise for school officials to consider numerous ways to support the financial needs and burdens of students more fully. Considering ways the institution might provide childcare options, increase pay for student workers, or decrease tuition and fees might allow students to prioritize pursuit of their educational goals, reducing the time to matriculate through the program and increasing overall retention and graduation rates. Ultimately, institutions that offer a multi-modal approach to their programs of study will be better positioned to address the needs of an increasingly diverse post-secondary population (Tuckel et al., 2023).

### ***Declarations***

This study was approved by the Institutional Review Board (IRB) at Oklahoma State University.

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