

DOI: https://doi.org/10.48009/3_iis_2022_116

Have students' perceptions of online education changed with the easing of COVID-19 restrictions?

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Abstract

This research examines student preference toward online and on-ground (i.e., face-to-face) course delivery methods in higher education as a result of the easing of COVID-19 pandemic restrictions. Over 130 undergraduate and graduate students enrolled in Computer and Information Systems courses at a university located in the northeastern United States were surveyed from April 2021 to May 2022. The study found that with the easing of COVID-19 restrictions in Spring 2022, students significantly preferred on-ground over online courses in comparison to their preferences when COVID-19 restrictions were still high in 2021. None of the potential influencing factors contributing to the changed preference, including students' perceptions of online course effectiveness, self-skills supporting online learning (e.g., work independently without supervision, prioritization and time management), and the usefulness of classroom interaction in learning, were found to have significant differences from the time when COVID-19 restrictions were high to the present easing of them.

Keywords: online education, face-to-face learning, computer information systems, COVID-19, student perceptions

Introduction

Institutes of higher education abruptly transitioned to an online delivery format when COVID-19 suspended face-to-face classes during the spring 2020 semester. This unforeseen adjustment in course delivery formats placed unprecedented demands on institutions of higher education. Students, faculty, and administrators had to deal with navigating Learning Management Systems (LMS), unfamiliar video conferencing technologies, and different procedures for assignments, examinations, and other coursework (Daniel, 2020; Liguori & Winkler, 2020). Common LMSs include Blackboard, Canvas, Desire2Learn, eCollege, and Moodle. Popular video conferencing platforms include Zoom, Webex Meetings, GoTo Meeting, and Google Meet.

Technologies for LMSs and video conferencing remain almost unchanged between 2020 and 2022; however, restrictions for COVID-19 have been eased or even lifted in 2022. For instance, in the state of Pennsylvania, students were required to wear masks in the classroom during the spring 2021 and fall 2021 semesters. This practice continued into the first half of the spring 2022 semester after which the masking restriction was lifted. The exact dates for the easing of mask mandates varied by school.

It is essential to practically investigate students' challenges and preferences in online learning with the easing of COVID-19 restrictions. Comparing online to face-to-face learning preferences and performances is beneficial both in the short term and in the long term. Zimmerman (2020) has already called such a comparison a "grand experiment" in an article published at the beginning of the pandemic in the Chronicle of Higher Education. The comparison will assist institutions of higher education in their strategic planning and execution regarding different modes of course delivery formats.

This research explored university students' perceptions of the comparison between online and on-ground learning during the COVID-19 pandemic with varied degrees of COVID-19 restrictions. The purpose of this study was to assess student perceptions of completely online and on-ground educational modes when there were high COVID-19 restrictions (April 2021-December 2021) and when the COVID-19 restrictions began to ease (Spring 2022).

Specifically, this study asks the following research questions (RQs):

RQ1: Have the students' preferences of course delivery format changed with the easing of COVID-19 restrictions?

RQ2: If there is change in students' preferences of course delivery format with the easing of COVID-19 restrictions, are students' perceptions of online course effectiveness, their self-skills supporting online learning (such as learning without direct supervision, prioritization, and time management), and the usefulness of classroom interactions contributing factors to the change?

Course Delivery Formats

The completely online delivery format requires no on-campus presence and occurs in either asynchronous mode or synchronous mode. In asynchronous mode, students are not required to meet with their instructor online at specified times/dates; this allows students to complete their work on their own time. Synchronous mode requires students to attend the course at regularly scheduled class times/dates and classes utilize a videoconferencing technology to create a real-time learning environment. With synchronous mode, the professor and the students require reliable Internet access, a webcam, and microphone. For both modes, most of the course content is housed within the LMS. Similar to their on-ground counterparts, online courses have weekly schedules and assignment due dates.

The traditional on-ground delivery format is one in which courses meet face-to-face in a specific classroom at scheduled times/days of the week throughout the semester. The on-ground with online supplement delivery format has lectures face-to-face but uses a companion LMS to house additional content that only supplements and assists face-to-face lectures. The content can be videos, readings, assignments, examinations, etc. The instructor may direct students to access to this additional content, but not as a replacement for attendance in the classroom.

For the purposes of this study, the hybrid delivery format was not implemented at the authors university. Instead, a virtual rotation format was initiated for on-ground classes to keep the class size small so as to allow for social distancing. The maximum number of seats in a class was limited to 28 students, If the size of the class was 14 students or below, then all classes meetings were on-ground. If the class size was above 14 to the maximum of 28 students, then half of student attended the class on-ground and the other half attended virtually. During the next class the students rotated in that the students who attended the class on-ground now attended virtually and those students who attended virtually were now on-ground. This was the

case for only several classes and the majority of the students surveyed attended classes either all on-line or all on ground. Those that attend virtually were considered to be on ground.

Literature Review

Pinkus (2020) studied course delivery preferences at the beginning of the pandemic and concluded that 86% of surveyed students enrolled in higher education programs across the nation found the transfer to online learning as being disruptive during the coronavirus outbreak and only 37% of the students were prepared to move to the online learning delivery method. Even among those students who did find themselves prepared for online learning, 71% still indicated that their school experience was disrupted by this transition. Forty-five percent of the students also expressed concerns about keeping up with their coursework and 33% were concerned with losing contact with their professors. Thirty-one percent were concerned about being physically isolated from classmates.

Leboff (2020) sought to understand students' perceptions about the online learning experience they received during the spring of 2020. Sixty-eight percent of the students surveyed felt that the abrupt movement to online learning was worse than the on-ground instruction that they had been receiving. A large portion of the students report missing face-to-face interaction with faculty (85%) and missing socializing with peers (86%). The majority of students were feeling anxious (52%) and concerned about passing (50%).

OneClass (2020) conducted a comprehensive survey of 1,287 students at 45 colleges and universities across the United States on the transition to online learning during the COVID-19 pandemic. The results found that 75% of respondents were unhappy with the quality of online learning during the COVID-19 pandemic. Reasons given for student dissatisfaction included the lack of face-to-face interaction, differences in learning styles making the learning difficult, unfamiliarity of technologies and engagement practices with online learning, not getting the expected curriculum, and concern over grades.

Lederman (2020) reported on a survey of 100 students at the start of the pandemic, when courses were first moved to remote learning, and then at the end of the spring 2020 semester. Although students had a preference towards online learning versus face-to-face, they still had concerns. A major concern of students transitioning to online learning was their academic performance (i.e., their final grade) followed closely by learning; students were not as concerned with maintaining communication with their professor or fellow classmates. Students rated the following factors, in the order of importance, that contributed to successful online learning: a good professor, a well-organized learning management system, communication technology, and course materials.

McKenzie (2021) reported results from The Digital Learning Pulse survey published by Bay View Analytics in partnership with Cengage, the Online Learning Consortium, the WICHE Cooperative for Educational Technologies, the Canadian Digital Learning Research Association, and the University Professional and Continuing Education Association. The survey included responses from 772 teaching faculty, 514 academic administrators, and 1,413 students who were registered at a U.S. higher education institution for both the fall 2020 and spring 2021 semesters. Despite the challenges of the emergency transition to online learning due to the COVID-19 pandemic and the limitations of remote instruction, a majority of students wanted the option to keep studying online. Seventy-three percent of the students surveyed "somewhat" agreed and 46% of them "strongly" agreed that they would like to take some fully online courses in the future. While 68% of them indicated they would be interested in taking courses offering a combination of in-person and online instruction.

Castro and George (2021) found that the pandemic did not appear to hinder course enrollment. However, the pandemic appeared to have impacted student preferences regarding course delivery formats. Before the pandemic, a majority of students (60%) selected the traditional in-person format. Looking beyond the pandemic, students appear to prefer more classes with online components. The data indicates that the course delivery format preferences are much closer together and more evenly distributed. In-person learning reverted to the most preferred format; however, only 40% of students selected it as their top choice. The second most popular delivery format was online asynchronous, which was selected by 26% of students surveyed, followed by online synchronous, which was selected by 22% of students surveyed. As established by the data, students prefer a more balanced approach to class delivery formats. This information is helpful, for planning purposes, as institutions once again begin delivering courses in all formats.

Almahasees et al (2021) randomly selected faculty and students to investigate the effectiveness, challenges, and advantages of online education during COVID-19. Their study found that both faculty and students agreed that online education was useful during the pandemic. However, the students' responses indicated that they were challenged in adjusting to an online learning format. Specific challenges involved students' struggle to adapt to online courses, lack of direct contact with the faculty, lack of motivation to attend classes, and time management. Moreover, some of the students indicated that the lack of interaction is also considered a challenge, reflecting on their progress and personalities.

Methodology

This survey consisted of thirty-four (34) closed-ended questions delivered by QuestionPro online survey software. The design included questions concerning student preferences related to course delivery formats as well as to Computer Information Systems (CIS) content, student demographics, and learning styles. The authors distributed the survey to students enrolled in CIS courses from the spring of 2021 to spring of 2022. To assure that the samples were independent, the authors made sure that students only completed the survey one time by asking students if that had previously taken the survey. The two time periods compared were April-December 2021 and April-May 2022. The results were gathered from a private university in the northeastern United States.

Results

RQ1: Have the students' preferences of course delivery format changed with the easing of COVID-19 restrictions?

The authors overall goal was to determine if students' attitudes toward the online learning format versus the on-ground learning format changed from a time with tight COVID-19 restrictions to a time with easing COVID-19 restrictions. To answer RQ1, the following survey question was asked: "If given a choice to take the same course in an ONLINE format or an ONGROUND format, would you select the ONLINE format?"

The results from 2021 versus 2022 are shown in Tables 1-3. With 1 being "Yes" and 2 being "No," there was a slight preference for online (average is 1.48) in 2021 during the pandemic with tight restrictions and a preference for not-online (average of 1.7) in 2022 with the easing of COVID-19 restrictions. In 2021, 52% of the students would choose online; however, in 2022, 70% of them would choose not-online. The difference in student preference is statistically significant at $p < .013$. There has been a significant change as students prefer a non-online course delivery format with the easing of COVID-19 restrictions.

Table 1: Student Preference of Selecting Online if both Online and On-ground Courses Available(1: Online; 2: On-ground)

Year	N	Mean	Std. Deviation
2021	79	1.48	.503
2022	56	1.7	.464
Total	135	1.57	.497

Table 2: Count and Percentage of Selecting Online vs. On-ground

			Online	Not Online	Total
Year	2021	Count	41	38	79
		% within Year	52%	48%	100%
	2022	Count	17	39	56
		% within Year	30%	70%	100%
Total		Count	58	77	135
		% across Year	43%	57%	100.0%

Table 3: The ANOVA Result

		Sum of Squares	df	Mean Square	F	Sig.
If given a choice to take the same course ONLINE or ONGROUND, would you select ONLINE? * Year	Between Groups	1.521	1	1.521	6.408	.013
	Within Groups	31.561	133	.237		
	Total	33.081	134			

Next the authors examined the potential influencing factors and review whether these factors changed with the pandemic progression.

RQ2: If there is change in students’ preferences of course delivery format with the easing of COVID-19 restrictions, are students’ perceptions of online course effectiveness, their self-skills supporting online learning (such as learning without direct supervision, prioritization, and time management), and the usefulness of classroom interactions contributing factors to the change?

The first factor examined was whether the change in preference was due to a perception of reduced effectiveness of online courses. The survey question asked was: “Do you perceive the OVERALL effectiveness of courses that are offered COMPLETELY online as ... (1: very effective to 6: very ineffective)?” The results are shown in Tables 4 and 5. Although there was a small dip in effectiveness from 2.82 to 3.02, this difference was not statistically significant with $p < .388$. Hence, students’ perceived effectiveness of online course did not affect their reduced preference for online courses.

Table 4: Students' Perception of Online Course Effectiveness (1: very effective; 6: very ineffective)

Year	N	Mean	Std. Deviation
2021	74	2.82	1.286
2022	48	3.02	1.12
Total	122	2.90	1.222

Table 5: The ANOVA Result

		Sum of Squares	df	Mean Square	F	Sig.
Do you perceive the OVERALL effectiveness of Online Courses * Year	Between Groups	1.124	1	1.124	.751	.388
	Within Groups	179.695	120	1.497		
	Total	180.820	121			

The second factor examined was whether the change in preference of course delivery mode was due to students' perception of self-skills supporting online learning.

The first self-skill examined was one's ability to work independently without supervision. The survey question asked was: "Select one of the following choices: 1: I work better without direct supervision; and 2: I work better when someone is there to keep me focused" The results are shown in Tables 6 and 7. Again, although there was a small increase in perception of "work better when someone is there to keep me focused" in 2022, this difference was not statistically significant with $p < .447$. Hence, students' perceived need for direct supervision did not affect their reduced preference for online courses.

Table 6: Students' Perception of Self-skill of Working Better without Supervision (1: work better without supervision and 2: work better with supervision)

Year	N	Mean	Std. Deviation
2021	77	1.44	.500
2022	55	1.51	.505
Total	132	1.47	.501

Table 7: The ANOVA Result

		Sum of Squares	df	Mean Square	F	Sig.
Work Better without Direct Supervision * Year	Between Groups	.146	1	.146	.581	.447
	Within Groups	32.732	130	.252		
	Total	32.879	131			

The second self-skill examined was one's ability to prioritize work. The survey question asked was: "Select one of the following choices: 1: I can prioritize my own workload; and 2: I tend to put work off until later." The results are shown in Tables 8 and 9. Again, although there was a small increased perception of procrastination in 2022, this difference was not statistically significant with $p < .566$. Hence, students' perceived procrastination did not affect their reduced preference for online courses.

**Table 8: Students’ Perception of Self-skill of Prioritization
(1: can prioritize workload; 2: tend to put work off until later)**

Year	N	Mean	Std. Deviation
2021	77	1.35	.480
2022	55	1.4	.494
Total	132	1.37	.485

Table 9: The ANOVA Result

		Sum of Squares	df	Mean Square	F	Sig.
Can Prioritize Workload * Year	Between Groups	.078	1	.078	.331	.566
	Within Groups	30.732	130	.236		
	Total	30.811	131			

The third and final self-skill examined was one’s ability to manage time. The survey question asked was: “In terms of time-management, I would describe myself as: 1: Well organized; and 2: Having difficulty completing assignments and/or projects.” The results are shown in Tables 10 and 11. Once again, there was a small increase in difficulty in completing assignments; however, the difference was not statistically significant at $p < .217$. Hence, students’ perceived time management skills did not affect their reduced preference for online courses.

**Table 10: Students’ Perception of Self-skill of Time Management
(1: well organized; 2: tend to put work off until later)**

Year	N	Mean	Std. Deviation
2021	77	1.18	.388
2022	55	1.27	.449
Total	132	1.22	.416

Table 11: The ANOVA Result

		Sum of Squares	df	Mean Square	F	Sig.
Well Organized * Year	Between Groups	.265	1	.265	1.541	.217
	Within Groups	22.364	130	.172		
	Total	22.629	131			

Finally, the third and final factor examined was whether the change in students’ preference in course delivery mode was due to students’ perceived usefulness of classroom interaction and discussion in learning. The survey question asked was: “Classroom interaction and discussion is: 1: Not essential for me to learn/understand; 2: Sometimes helpful for me to learn/understand; and 3: Always helpful for me to learn/understand.” The results are shown in Tables 12 and 13. Once again, there was a small increase in perceived effectiveness of classroom interaction; however, this difference was not statistically significant with $p < .734$. Hence, students’ perceived classroom interaction did not affect their reduced preference for online courses.

Table 12: Students’ Perception of Usefulness of Classroom Interaction and Discussion in Learning (1: Not Essential; 2: Sometimes helpful; 3: Always helpful)

Year	N	Mean	Std. Deviation
2021	77	2.19	.689
2022	55	2.24	.693
Total	132	2.21	.688

Table 13: The ANOVA Result

		Sum of Squares	df	Mean Square	F	Sig.
Usefulness of Classroom interaction and discussion in Learning * Year	Between Groups	.055	1	.055	.116	.734
	Within Groups	62.005	130	.477		
	Total	62.061	131			

Discussions

The researchers acknowledge the low sample size in the study as well as surveying only those students enrolled in CIS courses may not be generalized to a larger population. Hence, the findings here in the discussion are limited in scope and overall determination. Nevertheless, although students indicated a slight preference for online learning in the midst of the pandemic, when COVID-19 restrictions were in place, with the easing of COVID-19 restrictions, this study finds that student preference for online learning has also eased. The majority of students surveyed during the time of easing COVID-19 restrictions have indicated that they prefer non-online courses.

With the lessening of COVID-19 restrictions, the preference for non-online courses was not driven by students’ perceived effectiveness of online courses. Nor, was it driven by students’ perception of self-skills including: the ability to work independently without supervision, the ability to prioritize, and perceived time management skills. Likewise, students’ perceived usefulness of classroom interaction was not a driving factor for their preference for non-online courses.

Probable reasons for students’ change in preference (reverting back to a preference for non-online courses) could be their loneliness due to isolation during the pandemic as well as their experiences of Zoom fatigue. Both loneliness and Zoom fatigue could have pushed students to seek out face-to-face communities of learning. This proposition is supported by evidence from several recent psychological studies (Groarke et al 2021; Ramachandran 2021). The majority of students surveyed in this study were of the typical college age (18-24 years old). In a recent study on loneliness, Groarke et al (2021) found that 18-24-year old’s have the highest frequency of loneliness. They have cited several studies that found that more frequent in-person contact better mitigates the impact of the pandemic on loneliness. As reported by Ramachandran (2021), researchers at Stanford recently studied the psychological effects of spending multiple hours a day on Zoom or another video chat platform and have concluded that these platforms have design flaws that lead to exhaustion of the user’s mind and body. This Zoom fatigue may also contribute to students’ changed preferences of learning face-to-face in the classrooms. Although loneliness and Zoom fatigue are currently speculations of the researchers, to support this hypothesis the researchers plan to include questions, regarding loneliness and Zoom fatigue in future studies involving student perceptions of online versus on-ground learning.

Conclusion

Although the COVID-19 pandemic is still on-going, there have been changes. Reduced infection rates and more prevalent vaccination rates in the U. S. have led to the easing of COVID-19 restrictions. The mask mandate was lifted in the classroom in late Spring 2022 semester in Higher Education institutions in the northeast region of the U. S. Consequently, students have also eased their anxiety of infection in physical classrooms and preferred face-to-face in person learning over online learning via video conferencing and Learning Management Systems although their perceptions of online course effectiveness, their self-skills in online learning, and the usefulness of classroom interaction remain unchanged. Policy makers in High Education institutions should accommodate and adapt to students' preferences and find the best and safest pathway to effective education during and post pandemic.

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