Student Acceptance of Online Learning

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The accelerated adoption of online learning during the COVID-19 pandemic provides an opportunity for the exploration of college student acceptance of online learning. We examine whether previous experience with online learning results in students' greater acceptance of this modality as a valid educational experience. Findings are generated using original survey data from Park University undergraduate and graduate students. Our results have the potential to guide faculty and administrators regarding how online learning might be introduced and promoted, the pace at which their institution might adopt this modality, and the configuration of online learning that might work best for their students.

Keywords: online learning, learning modality, student opinion of instructional methods

GROWTH IN ONLINE LEARNING

The purpose of this study is to investigate the experiences and characteristics of college students who are most accepting of the online learning modality as a valid learning experience. Propelling this inquiry is the desire to provide insight into how online courses might best be designed and promoted to attract students – an insight that may have special relevance for educational administrators, faculty and course designers.

Traditionally, the transmission of knowledge was conveyed within the classroom. Today, we may associate distance education with online education. However, there is a long history that began in the 18th century through the parcel post and in 1874 Illinois Wesleyan College developed the first college-level correspondence courses (Emmerson, 2004). Distance learning evolved with technology advancements through radio and the University of Wisconsin-Extension was created in 1919 specifically as a distance teaching unit. Educational institutions acquired radio broadcast licenses and educational broadcasting expanded (Engel, 1936). More technological advances brought television broadcasting to education in 1932 at the University of Iowa. Kansas State University, Iowa State University, and University of Michigan quickly followed the educational television trend. As other educational institutions embraced education TV and demand increased, the Federal Communications Commission began reserving television channels specifically for education. By 1966, the need for educational television had grown exponentially and the Federal Communications Commission reserved 632 channels for educational use.

More recently, institutions of higher education, along with educational institutions generally, began to offer courses and programs online. Though initially developed to serve the U.S. Military as a tool to collect and store information (Baranetsky, 2014), the Internet has transformed life and with it we entered the age of the World Wide Web. At the same time the World Wide Web was created in 1991, the University of Phoenix began offering online courses to students (Kentnor, 2015). The web opened up doors for online communication, information, and research. By 1998, California Virtual University, New York University, Park University, and Western Governors University were offering online courses (Beck, 2015; Kentnor, 2015).

Reasons for the transition to online vary. Certainly, the capacity existed and prior to the COVID-19 pandemic, there was growth in online course and program offerings from institutions that positioned themselves as early entrants in what would become a growing market. As a plethora of higher education institutions competed for a declining population of traditional college aged students, a non-traditional market became more appealing. There was an untapped cohort of potential students who, due to life situations related to marital status, occupation and lack of proximity to brick-and-mortar facilities, were not positioned to avail themselves of educational opportunities – realistically, an online education was the means by which to obtain a degree. Traditional brick-and-mortar-centered institutions, in a quest of the enrollment benefits of this non-traditional market, began to pursue their own online course and program development.

In early 2020, the COVID-19 pandemic began to spread throughout modern economies. Motivated by health concerns in the United States, many institutions of higher education rapidly adopted online learning. Some educational institutions were more prepared than others and the extent to which institutions invested in technology and training varied, but those that offered no online response to the pandemic were rare. The following statistics point to both the pre-COVID growth in online learning and the impact of the COVID pandemic. In 2011, 65% of institutions of higher education reported online learning was important to their future education plans (Kentnor, 2015). According to the National Center for Education Statistics (NCES), in 2013-14, 26.4% of college students in the United States had enrolled in distance education. By 2018-19, 37.1% of college students in the United States had enrolled in distance education. During COVID in 2020-21, 72.8% of college students had enrolled in distance education. This is a remarkable increase of 46.4% of students who enrolled in distance education in 2020-21 and largely the result of the COVID pandemic.

RESISTANCE TO ONLINE LEARNING: THE CHALLENGE

For most educational institutions, the investment in technology and training necessitated by the pandemic may carry over to the post-pandemic context and provide the foundation for the continued use of online courses and programs. As a result, students who otherwise would take courses face-to-face might be afforded greater flexibility to take a mix of traditional and online courses. A question, though, is how accepting will students be of online learning as a legitimate learning experience? The pandemic quickened the pace at which college students were exposed to online learning. Post-pandemic, whether online learning opportunities in higher education continue to expand, or cease to grow, or even contract seems an open question.

The adoption of online education – particularly the accelerated adoption during the pandemic – has been accompanied by a level of resistance. While online education provides benefits such as a flexible learning environment (Allen et al., 2010), reduction in educational costs (Harrison & Lee, 2018), and access to education, there has been resistance to online education with both faculty and students. Some of this resistance was driven by negative experiences as the quickness with which educational institutions adopted online learning outpaced faculty and student training in this new modality. Related, previous research had indicated faculty resistance to online education due to "increased workload, the altered role of the instructor, lack of technical and administrative support, reduced course quality and negative attitudes from colleagues" (Miller and Ribble, 2010).

Recent research has identified a multitude of reasons for resistance to online education and this resistance has similarities between both students and faculty. A major point of resistance for students is the

lack of synchronous activity and the lack of personal communication (Lall and Singh, 2020). Faculty also identified a lack of engagement with learners as a major concern in the online classroom (Vivolo, 2016). While online education provides access to education in diffuse locations and various student demographics, a lack of personal interaction, and an inability to have spontaneous informal discussion are cited as problematic with online education (Delaney et al., 2004).

While online education allows both faculty and students to access courses from any location, the online modality may present accessibility issues for the student population. Students noted that technological issues presented problems during the pandemic. Issues arose for students related to stable Wi-Fi and having access to the necessary learning devices (McKenzie, 2020). As the United States slowly moves beyond the pandemic, colleges and universities may begin to test the willingness of students to pursue online coursework. Continued student resistance to online learning may manifest in the failure of students to enroll in online courses when they have a choice between online and traditional face-to-face courses.

An important question related to online education: Are colleges and universities going to find themselves in the position of having invested in online learning capacity only to have their traditional students, those positioned to enroll in an online course even on occasion, avoid this option in droves? Alternately, can the resources applied to coping with the pandemic reap benefits for both higher educational institutions and their students?

It is of course possible for an institution to bifurcate – to offer online courses to students for whom this modality is the best option and offer traditional classes to on-campus and local students. This is a viable model for some institutions if there are enough of both cohorts – and if the institution has the resources to run two distinct types of modalities for separate populations. However, for many institutions it may be both more cost effective and provide a more diverse learning experience when on online and traditional learning modalities are employed in tandem. The integration of modalities, though, will necessitate acceptance of online learning as valid by a traditional student cohort. The essential issue here is whether online learning is to be understood as mostly for those who have no alternative or if it can become an accepted learning experience by a diverse student body.

Post-pandemic, institutions of higher education will need to strategically develop and maintain their online educational offerings. Child et al. (2021) surveyed academic research related to online education and found that institutions should focus on three main areas, “create a seamless journey for students, adopt an engaging approach to teaching, and build a caring network.” A seamless journey was described as institutions creating engaging content on platforms which are accessible through various devices (Child et al., 2021). Engaging approaches in online education should focus incorporation of adaptive learning tools, real-world application, and utilize tools to enable group learning (Child et al., 2021). Finally, Child et al. (2021) noted that institution should create a caring network. The caring network creates opportunities for interpersonal connections. In addition, institutions should create dedicated systems to assist students with personal technology, financial issues, academic concerns, and finally a means to connect to their classmates and instructors.

FRAMEWORK

Conceptually, students’ orientation toward online learning can be understood as the result of variables that either push students away from or pull students in the direction of online learning. Therefore, students may be more or less accepting of, or more or less resistant to online learning. One key variable that may increase acceptance and decrease resistance is experience with online learning. Experience may mitigate fears and uncertainties about the online learning process. For this reason, we examine whether experience with online learning results in greater acceptance among college students of this modality as a valid educational experience. Given students at many institutions shifted to online courses, at least in part, as a result of the pandemic, we have the opportunity to investigate the outcome.

Once the association between student opinion of online learning and prior experience with online courses has been investigated, we will address the idea that particular instructional elements of online courses might be tailored differently to accommodate different student populations. For any educational

institution, students represent a diversity of backgrounds, experiences, skills, and confidence levels. A growing body of literature suggests that particular online learning elements such as timely communication, access to technology, course material designed for the online environment, and frequent engagement with students and opportunities for teacher-student interaction (Adams and Vanderleeuw, 2020; Darby, 2020; Kopit and Marker, 2020; Matab, 2020; Sun at al., 2022) are applicable. A key distinction between students may be the extent to which they have a level of experience with the online learning environment. To facilitate this avenue of inquiry, we will explore student attitudes toward various online instructional methods, and how attitudes may differ between students with and students without online experience.

Following this, we will address how online courses might be tailored to student subpopulations. Our investigation into the relevance of prior online learning experience, and attitudes toward online instructional methods, will include the potential influence of student characteristics such as grade level, age, military experience, and gender. Because the characteristics of the cohort most accepting of online learning may differ from those of the cohort most resistant, our findings have the potential to guide faculty and administrators alike regarding how online learning might best be introduced and promoted, the pace at which their institution might adopt the online modality, and the configuration of the online learning that might best work for their institution and particular students.

DATA AND METHODS

We analyzed responses to a survey administered to Park University students September 24 through October 9, 2020. Park University is a private, nonprofit, liberal arts institution located in the Kansas City Missouri area that offers 78 different degree programs, 31 certificates, and employs 112 full time faculty across 41 campus centers in the United States (Park at a Glance, 2022). While traditionally a liberal arts undergraduate institution, the university offers Master's degrees in various fields and, depending upon the particular area of study, offers both traditional face-to-face and online courses. During the spring of 2020, in response to the emerging pandemic Park University committed significant resources to moving courses online (with the exception of those courses, such as science labs, that could not be replicated in an online format). By the following fall, most the university's course offerings and programs were online, with 88% of undergraduate and 84% of graduate programs having at least one course offered online. Park University was able to accomplish this transition due to its familiarity with online learning, having introduced online courses at the undergraduate level in 1998 and at the graduate level in 2002 (Beck, 2015).

To gauge the effectiveness of these efforts, students were asked about their educational plans in the context of the pandemic, their opinions regarding different learning modalities, and what they liked and did not like about the online modality. The survey was sent to nearly 13,000 students via email, with two reminders to participate sent prior to the close of the survey. The survey used the Campus Labs platform, was open from September 24 through October 2, 2020, contained 47 questions, took an average of 14 minutes to complete, and generated 790 total respondents that yield a margin of error of +/- 4 percentage points at 95% confidence level. Institutional Review Board approval to release survey results was obtained prior to opening the survey.

A description of, and rationale for, the variables used in the following analysis along with the question wording from which these variables are derived, statistical technique and characteristics of the surveyed students are provided below.

Survey Questions (Survey Question in Italics)

Liking Online More than Face-to-Face/Blended**:** Dummy variable recoded from original (coded 1 if liked online more than face-to-face/blended, 0 for all else). This is used as a measure of acceptance of online learning and is a key dependent variable. The question wording asks students to compare online with face-to-face or blended courses. Essentially, this means that students were being asked to give their opinion on asynchronous online courses, Park University's primary modality at the time of the survey. Some of Park University's online courses were offered in blended mode, and students that had taken online coursework at other institutions may have taken a blended modality. *Which of the statements below best describes your*

opinion regarding online courses? 1=I like it more than face-to-face or blended courses, 2=I like it less than face-to-face or blended courses, 3=I like it about the same as I like face-to-face/blended classes, 4=I don't really have an opinion about it, 5=I have not taken a face-to-face or blended course

Liking Online Less than Face-to-Face/Blended**:** Dummy variable recoded from original (coded 1 if liked online less than face-to-face/blended, 0 for all else). This is used as a measure of resistance to online learning and is a key dependent variable. The question wording asks students to compare online with face-to-face or blended courses. Essentially, this means that students were being asked to give their opinion on asynchronous online courses Park University's primary online at the time of the survey. Some of Park University's online courses were offered in blended mode, and students who had taken online coursework at other institutions may have taken a blended modality. *Which of the statements below best describes your opinion regarding online courses? 1=I like it more than face-to-face or blended courses, 2=I like it less than face-to-face or blended courses, 3=I like it about the same as I like face-to-face/blended classes, 4=I don't really have an opinion about it, 5=I have not taken a face-to-face or blended course*

Took at Least One Online Course: Dummy variable recoded from original (coded 1 if taken online course at Park University or elsewhere prior to summer 2020, 0 for all else). Ostensibly, can be a few as having taken 1 online course. When Took Primarily Online Courses is accounted for (see directly below) this is a measure of having taken as few as one online course. *Before the summer term, had you ever taken an online course? 1=Yes-At Park only, 2=Yes-But not at Park, 3=Yes-Both at Park and somewhere else, 4=No*

Took Primarily Online Courses: Dummy variable recoded from original (coded 1 if taken courses primarily online at Park University of anywhere else prior to summer 2020, 0 for all else). Interpreted as having taken a majority of coursework online. *Prior to this fall semester, how did you primarily take courses? 1=Face-to-face, 2=Blended, 3=Online*

Took Primarily Face-to-Face Courses: Dummy variable recoded from original (coded 1 if taken courses primarily face-to-face prior to summer 2020, 0 for all else). Interpreted as having taken a majority of coursework face-to-face. *Prior to this fall semester, how did you primarily take courses? 1=Face-to-face, 2=Blended, 3=Online*

Course Previously Offered Face-to-Face: Dummy variable recoded from original (coded 1 if prior to current semester, course was offered face-to-face, 0 for all else). Conceptually, and for purposes of application outside of Park University, can be considered a proxy for courses offered or frequently offered face-to-face, where a student has the option to select the traditional or online modality. Assume a greater level of resistance to online learning if a face-to-face section is normally offered. *Did your course at Park University this fall used to be offered face-to-face or blended before the epidemic and transitioned to online learning? 1=Yes, 2=No, 3=Not Sure*

Grade: Coded 1, Freshman, through 5, Graduate student. Acceptance of online learning expected to increase from lower to higher grades due to experience with college-level coursework. *Currently, are you a freshman, sophomore, junior, senior, or graduate student? 1=Freshman, 2=Sophomore, 3=Junior, 4=Senior, 5=Graduate Student*

Age: Classified in numerically ascending categories, 1 through 9. Acceptance of online learning expected to increase with age due to skills and confidence associated with lived experience. *What is your age? 1=18-22, 2=23-27, 3=28-32, 4=33-37, 5=38-42, 6=43-47, 7=48-52, 8=53-57, 9=58+*

Military Status: Dummy, recoded from original variable (coded 1 if current military or veteran, 0 for all else). Acceptance of online learning expected to increase with military service due to skills, leadership opportunities and confidence associated with military experience. *What is your military service status? 1=Military, active, 2=Military, retired, 3=Non-military*

Gender: Dummy, recoded from original variable (coded 1 for Female, 0 for all else). Used as a control with no explicit expected relationship (though the composition of some programs may be skewed in the direction of one or another gender, and academic programs can differ regarding online/face-to-face options). *What is your gender? 1=Female, 2=Male, 3=Other/Prefer not to self-describe*

Experienced Internet Problems: One of top three responses from a set of questions about technical difficulties experienced with online courses; students could select as many as applied. Coded 1 if Internet

Problems selected, 0 if not. Possible technical problems anticipated to influence opinion of online learning, and resistance to online learning expected to increase with encountered problems. Coded item of interest in bold. *Did you experience technical issues with any of the following? 1=Issue with reliable Internet access, 2=Issue with access to a computer with necessary software, 3=Issue with access to Park library, 4=Issue with access to a tutor, 5=Issue with access to Park student technical help, 6=Issue with access to textbooks and required coursework material, 7=Issue with taking a quiz or an exam, 8=Communication issue with the instructor, 9=Communication issue with student disability services, 10=Other* {provided for open-ended response}

Experienced Problems Obtaining Materials: One of top three responses from a set of questions about technical difficulties experienced with online courses; students could select as many as applied. Coded 1 if Problems obtaining Texts and Course Materials selected, 0 if not. Possible technical problems anticipated to influence opinion of online learning, and resistance to online learning expected to increase with encountered problems. Coded item of interest in bold. *Did you experience technical issues with any of the following? 1=Issue with reliable Internet access, 2=Issue with access to a computer with necessary software, 3=Issue with access to Park library, 4=Issue with access to a tutor, 5=Issue with access to Park student technical help, 6=Issue with access to textbooks and required coursework material, 7=Issue with taking a quiz or an exam, 8=Communication issue with the instructor, 9=Communication issue with student disability services, 10=Other* {provided for open-ended response}

Experienced Problems Contacting Instructor: One of top three responses from a set of questions about technical difficulties experienced with online courses; students could select as many as applied. Coded 1 if Problems Contacting Instructor selected, 0 if not. Possible technical problems anticipated to influence opinion of online learning, and resistance to online learning expected to increase with encountered problems. Coded item of interest in bold. *Did you experience technical issues with any of the following? 1=Issue with reliable Internet access, 2=Issue with access to a computer with necessary software, 3=Issue with access to Park library, 4=Issue with access to a tutor, 5=Issue with access to Park student technical help, 6=Issue with access to textbooks and required coursework material, 7=Issue with taking a quiz or an exam, 8=Communication issue with the instructor, 9=Communication issue with student disability services, 10=Other* {provided for open-ended response}

Online Instructional Method: *Which online instructional method did you find most engaging? 1=Discussion boards, 2=Video conferencing meetings with the instructor and all students, 3=Team projects when students work on a group project on their own, 4= Team projects when students work together at the same time on a project, 5=Blogs, 6=Recorded lectures, 7=Virtual office hours, 8=Emails, 9=Other*

Statistical Technique

Because the dependent variables in our models are binary, coded 1 for the opinion under investigation (like online MORE than face-to-face/blended / like online LESS than face-to-face/blended) and 0 for all else (that also included categories for like online the same or have no opinion) binomial regression was used as the appropriate statistical technique – specifically, IBM SPSS V24 Binomial Logistic Regression. Campus Labs-collected survey data were converted to SPSS data file. Variables used in the multivariate models presented in Tables 1, 2, 5 and 6, were tested for collinearity. This was determined not to be a concern. The Tolerance level was at or above .460 and the Variance Inflation Factor was at or below 2.172 for each variable.

Student Survey Cohort Characteristics

Of the 679 students who responded to the question on their grade status, 10.6% were Freshman, 15.5% were Sophomores, 23.5% were Juniors, 29.3% were Seniors and 21.2% were Graduate Students.

Of the 674 students who responded to the question on age, 33.7% were 22-27, 10.4% were 28-32. 11.6% were 33-42, 9.3% were 38-42, 7.6% were 43-47, 5.0% were 48-52, and 6.4% were 53 and above.

Of the 678 who answered the question, 62.2% were Female, 35.3% were Male and 2.2. identified as Other. Of the 679 who answered the question, 24.2 were active or retired military and 75.6% were non-

military. A category for Hispanic/Latino inadvertently left off the survey question on ethnicity/race; therefore, this variable was not used in the analysis.

At this juncture, particular attention should be given our measurement of acceptance of and resistance to online learning. The question wording was: *Which of the statements below best describes your opinion regarding online courses?* The response set was*: 1=I like it more than face-to-face or blended courses, 2=I like it less than face-to-face or blended courses, 3=I like it about the same as I like face-to-face/blended classes, 4=I don't really have an opinion about it, 5=I have not taken a face-to-face or blended course.* Acceptance was operationalized as liking online more than face-to-face/blended (coded 1 if liked more and 0 for all other responses); resistance was operationalized as liking online less than face-to-face/blended (coded 1 if liked less and 0 for all other responses). Wording in the response set – where face-to-face and blended courses were combined in the same statement – means that students essentially were asked their opinion about the fully asynchronous online experience. The asynchronous modality was Park University's primary modality at the time of the survey, so students who answered this question were familiar with this modality. The distinction between asynchronous and synchronous online learning, however, is important to keep in mind. In general, students may be more positive toward synchronous compared to asynchronous online learning (Fabriz, Mendzheritskaya and Stehle, 2021). Further, students are more receptive to face-to-face learning than to online learning (Nambiar, 2020). Therefore, our findings, in particular those in Tables 1 and 2, relate to a situation where the most resistance might be expected, i.e., the asynchronous environment.

FINDINGS

Table 1 reports results of a model of liking online courses more than face-to-face/blended courses (our measure of acceptance of online learning) and Table 2 shows model results for liking online courses less than these other modalities (our measure of resistance to online learning). A shown in Table 1, with other possible influences accounted for, there is a statistically significant association (at the .05 level) between acceptance of online learning and having taken primarily online courses prior to summer 2020. Among students who reported taking primarily online courses in the past, their odds of liking online courses more than face-to-face/blended courses are 2.4 times greater (Exp(B)=2.375), when other model variables are held constant (based on the exponentiation of the estimate, or B coefficient, designated Exp(B), that yields an odds ratio, reported for each predictor variable in the multivariate model tables; the odds ratio is the best way to interpret logistic regression coefficients, see Peng, So, Stage & St. John, 2002). No other predictor variable is statistically associated with acceptance of online learning at even the .10 level (though.10 is used as the statistical level of significance cut-point, subsequent discussion will distinguish between associations at the .05 level and those at the .10 level).

TABLE 1
MODEL OF LIKING ONLINE MORE THAN FACE-TO-FACE/BLENDED

	Estimate	*S.E.*	*Wald's X^2*	*Exp(B)*	*Sig.*
Took at Least One Online Course	-.096	.275	.122	.908	.726
Took Primarily Online Courses	.865	.284	9.310	2.375	.002
Took Primarily Face-to-Face Courses	-.286	.299	.917	.751	.338
Course Previously Offered Face-to-Face	-.367	.232	2.503	.693	.114
Grade	-.002	.083	.001	.998	.980
Age	.051	.047	1.166	1.052	.280
Military Status	-.157	.244	.412	.855	.521
Gender	.223	.218	1.053	1.250	.305
Experienced Internet Problems	.029	.206	.020	1.029	.888

Experienced Problems Obtaining Materials	.285	.246	1.337	1.329	.248
Experienced Problems Contacting Instructor	-.145	.264	.304	.865	.582
Constant	-1.499	.470	10.186	.223	.001
-2 Log Likelihood	667.264				
Model chi square	54.818				.000
Pseudo R2	.082 / 121				
N	644				
Note: Pseudo R2 is Cox & Snell R2 / Nagelkerke R2					

Table 2 displays results of a model of liking online courses less than face-to-face or blended courses. Controlling for other possible influences, there is a statistically reliable association between resistance to online learning and both previous modality variables – having taken primarily online courses (at the .05 level) and having taken primarily face-to-face courses (at the .10 level) prior to summer 2020. Students who took primarily online courses are less likely to prefer face-to-face or blended courses in comparison to others; among these students, their odds of liking face-to-face/blended courses are 0.3 times less, with other variables held constant (Exp(B)=.263). Among those who reported taking primarily face-to-face courses, their odds of preferring face-to-face/blended courses over online courses are 1.5 times greater, other variables held constant (Exp(B)=1.546). In addition, students who had to take courses otherwise offered in a traditional mode (at the .05 level), as well as those who experienced internet problems (at the .10 level), are more likely to favor face-to-face/blended courses. (With a pseudo R2 in the range of .217 to .292, the model may somewhat better account for why students liked online less in contrast to why students liked online more than other modalities.)

TABLE 2
MODEL OF LIKING ONLINE LESS THAN FACE-TO-FACE/BLENDED

	Estimate	*S.E.*	*Wald's X^2*	*Exp(B)*	*Sig.*
Took at Least One Online Course	-.222	.229	.936	.801	.333
Took Primarily Online Courses	-1.336	.279	22.854	.263	.000
Took Primarily Face-to-Face Courses	.436	.237	3.372	1.546	.066
Course Previously Offered Face-to-Face	.776	.206	14.159	2.173	.000
Grade	-.065	.080	.659	.937	.417
Age	-.009	.048	.034	.991	.854
Military Status	.280	.252	1.235	1.323	.266
Gender	-.124	.201	.379	.883	.538
Experienced Internet Problems	.331	.188	3.094	1.392	.079
Experienced Problems Obtaining Materials	-.162	.234	.478	.851	.490
Experienced Problems Contacting Instructor	.303	.231	1.710	1.354	.191
Constant	-.317	.417	.577	.729	.447

	Estimate	*S.E.*	*Wald's X^2*	*Exp(B)*	*Sig.*
-2 Log Likelihood	715.838				
Model chi square	157.358				.000
Pseudo R2	.217 / 292				
N	644				
Note: Pseudo R2 is Cox & Snell R2 / Nagelkerke R2					

Tables 3 and 4 report student opinion on a series on online instructional methods by whether students like online more (accept online learning) or like online less (resist online learning) compared to face-to-face/blended, and whether students took primarily online or took primarily face-to-face courses, respectively. Reviewing the results displayed in Table 3, though there are many similarities, there are a few notable differences between students who accept and those who resist online learning. Students who accept online select discussion boards as their favored online instructional method; this is nearly double the percent of this cohort who select discussion boards their least preferred instructional method. By contrast, nearly a quarter of those who resist online learning, dislike discussion boards, and for this cohort, discussion boards rate as the least favored online instructional method. Those who resist online learning favor video conferencing by a substantial margin (nearly a 27 percentage-point difference among this cohort between liking this instructional method the most and liking it the least). Comparatively, those who accept online learning are unenthusiastic about this particular online instructional method.

A key takeaway from the findings in Table 3 is that those who accept online learning (i.e., like online more) favor an interactive online instructional method (discussion boards) while those who resist online learning (i.e., like online less) favor the online analog of a traditional classroom environment (video conferencing with the instructor and students). Beyond this, virtual office hours are slightly preferred by students who accept online learning compared to those who resist, though opinion overall on this instructional method is not overwhelming in either direction. The remaining online instructional methods garner similar responses from both cohorts. Recorded lectures and email are generally favored while blogs, and most particularly team projects (whether a student works alone or as part of the group) are uniformly unfavored.

TABLE 3
OPINION OF ONLINE INSTRUCTIONAL METHOD BY WHETHER STUDENTS LIKE ONLINE MORE OR LESS COMPARED TO FACE-TO-FACE/BLENDED

	Accept				Resist		
Instructional method like:	*Most*	*Least*	*diff*		*Most*	*Least*	*diff*
Instructional Methods:							
Discussion Boards	29.8	15.6	14.2		13.2	23.6	-10.4
	117	56			77	164	
Video Conferencing	14.0	11.5	3.5		31.4	4.8	26.6
	55	41			183	33	
Team Projects (work alone)	6.6	21.5	-14.9		4.8	18.7	-13.9
	26	77			28	130	
Team Projects (part of group)	4.3	21.5	-17.2		8.6	14.7	-6.1
	17	77			50	102	
Blogs	3.8	11.2	-7.4		1.2	13.5	-12.3
	15	40			7	94	

	Accept				Resist		
Instructional method like:	*Most*	*Least*	*diff*		*Most*	*Least*	*diff*
Recorded Lectures	16.8	8.9	7.9		18.9	10.5	8.4
	66	32			110	73	
Virtual Office Hours	11.2	5.9	5.3		9.3	7.6	-1.7
	44	21			54	53	
Email	13.3	3.9	9.4		12.7	6.5	6.2
	52	14			74	45	
Total # Responses	189	189			296	296	
Note: Diff = %Most - %Least; for each instructional item, top figure is percentage, bottom figure is number of responses							

Table 4 reports student opinion of online instructional methods by whether students took courses primarily online or primarily face-to-face prior to summer 2020. Because opinion of online is statistically associated with primary modality taken in the past (see Tables 1 and 2), the findings here are compatible with those in Table 3. Discussion boards are the preferred instructional method among those who took courses primarily online, and video conferencing is the favored instructional method among those who took primarily face-to-face courses. Students who took primarily online courses do not necessarily dislike video conferencing that, along with emails, recorded lectures, and virtual office hours, comprise this cohort's most preferred online instructional methods. Though students who took primarily face-to-face courses tend to dislike discussion boards, a segment of this cohort favors this instructional method; this cohort also favors recorded lectures, emails and virtual office hours. On these several instructional methods, the two cohorts are similar. Both cohorts are also similar in their dislike of team projects of any type, by large margins.

TABLE 4
OPINION OF ONLINE INSTRUCTIONAL METHOD BY PRIMARY COURSE MODALITY

	Primarily Taken ONLINE				Primarily Taken FACE-TO-FACE		
Instructional method like:	*Most*	*Least*	*diff*		*Most*	*Least*	*diff*
Instructional Methods:							
Discussion Boards	62.4	27.5	34.9		30.5	54.3	-23.8
	153	66			92	164	
Video Conferencing	24.9	18.3	6.6		62.3	13.2	49.1
	61	44			188	40	
Team Projects (work alone)	13.9	37.5	-23.6		11.3	44.0	-32.7
	34	90			34	133	
Team Projects (part of group)	13.1	37.9	-24.8		12.3	39.7	-27.4
	32	91			37	120	
Blogs	5.7	20.8	-15.1		4.3	32.8	-28.5
	14	50			13	99	
Recorded Lectures	27.3	11.3	16.0		41.1	25.5	15.6
	67	27			124	77	

	Primarily Taken ONLINE				Primarily Taken FACE-TO-FACE		
Virtual Office Hours	21.6	13.3	8.3		20.9	14.2	6.7
	53	32			63	43	
Email	29.4	9.2	20.2		28.8	13.6	15.2
	72	22			87	41	
Total # Responses	245	240			302	302	
Note: Diff = %Most - %Least; for each instructional item, top figure is percentage, bottom figure is number of responses							

Student opinion of online instructional method in many cases is similar, despite differences in overall opinion of online learning or prior experience with online coursework. On a few key instructional methods, however, there are pronounced differences. These differences suggest reliable variation in preferences regarding how online courses might emulate the traditional course environment and the level of interaction with student peers. Findings to this point have shown that acceptance of online learning is associated with having taken online courses, and that there are some differences in preferred online instructional methods between students based on their opinion of online and the primary modality of prior coursework. The issue now becomes a decidedly practical one: How can administrators, teachers and online designers readily identify student cohorts most appropriate for particular online instructional methods? One way to address this is to consider grade level.

Tables 5 and 6 report results of a model that predicts who took primarily online courses prior to summer 2020 based on student grade level, age, military status, and gender, and who primarily took face-to-face courses prior to summer 2020 based on these same student characteristics, respectively. Because the dependent variable in both models is binary (1/0), results are binomial regression coefficients. As shown in Table 5, having taken primarily online courses is positively associated with grade level, age, and military status (all at the .05 level). The likelihood of having taken mostly online courses increases among those in more advanced grades (e.g., senior and graduate student), among older students, and among veterans and current military. As displayed in Table 6, having taken primarily face-to-face courses is negatively associated with age and military status (at the .05 level) as well as with grade level (at the .10 level). The likelihood of having taken mostly face-to-face courses prior to summer 2020 decreases among older students, among veterans and current military students, along with those in more advanced grades.

TABLE 5
MODEL OF TAKEN COURSES PRIMARILY ONLINE

	Estimate	*S.E.*	*Wald's* X^2	*Exp(B)*	*Sig.*
Grade	.181	.074	5.976	1.199	.014
Age	.189	.041	21.747	1.208	.000
Military Status	.495	.213	5.408	1.641	.020
Gender	.202	.190	1.129	1.224	.288
Constant	-2.241	.307	53.331	1.199	.000
-2 Log Likelihood	795.938				
Model chi square	60.308				.000
Pseudo R2	.089 / 121				
N	649				
Note: Pseudo R2 is Cox & Snell R2 / Nagelkerke R2					

TABLE 6
MODEL OF TAKEN COURSES PRIMARILY FACE-TO-FACE

	Estimate	*S.E.*	*Wald's* X^2	*Exp(B)*	*Sig.*
Grade	-.120	.071	2.840	.887	.092
Age	-.260	.044	34.576	.771	.000
Military Status	-.536	.225	5.703	.585	.017
Gender	-.267	.185	2.086	.765	.149
Constant	1.586	.286	30.738	4.883	.000
-2 Log Likelihood	813.275				
Model chi square	80.688				.000
Pseudo R2	.117 / 156				
N	649				
Note: Pseudo R2 is Cox & Snell R2 / Nagelkerke R2					

DISCUSSION

It is of interest that none of the examined student demographic variables had a direct, reliable statistical association with opinion of online learning. Several, in particular grade level, and military experience might have been expected to exhibit a relationship due to their ostensible connection with increased self-efficacy, where among these groups success in the online environment may have been less of an issue (Geier, Stowe and Schwartz, 2020). Rather, when the findings are viewed in their totality, they suggest an indirect association between acceptance of online learning and student demographic characteristics: Grade level, age and military experience are positively associated with prior online experience, that in turn is positively associated with acceptance of online learning. Theoretically, it may be that efficacy acts to motivate individuals to try the online environment; from that initial point, familiarity with this modality becomes central.

Regarding prior online experience, findings indicate that a single experience with online learning does little to encourage acceptance of this learning modality as a valuable learning experience. Associated with opinion of online learning are primary learning modalities (either online or face-to-face) previously taken in the past. We might correctly interpret having "primarily" taken a particular modality as having taken the majority of courses in that modality. While we cannot address why some students took a majority of their courses in online or another modality, we can say having taken a majority of courses in a particular modality is related to opinion on course modality. Understanding of this relationship can offer the foundation upon which online courses might be designed to best accommodate students at varying levels of comfort with the online modality.

Before proceeding further with this line of discussion, a couple caveats are in order regarding the association between acceptance of online learning and prior online experience. Though we have information on a student's primary learning modality, we cannot tell how many online courses were taken. Therefore, we cannot speak to the idea of a student needing to take some specific number of courses before online learning is accepted as a valid learning experience. There is the possibility that greater experience with online results in greater acceptance of this modality, and our findings are compatible with, but do not conclusively demonstrate, this idea. Relatedly, we need to be cautious about inferring causality. As noted, the analysis does not speak to why students initially adopted one learning modality over another. Findings do point to two broad categories of students – those with and those without much online experience – each with a different view of online instructional methods. This distinction, we believe, offers insight into the design of online courses that accommodate a diverse student population.

Regarding online instructional methods, the difference we found between those most familiar with online courses and those most familiar with face-to-face courses are nuanced and within a context of shared attitudes. Those with greater online experience tend to prefer some instructional methods that allow for interaction with other students (e.g., discussion boards). Those with greater face-to-face experience tend to favor some online instructional methods that imitate a more conventional classroom environment (e.g., video conferencing with the instructor and classmates). For these students in particular, a new learning environment that offers a familiar instructional aspect might be very welcome. On other instructional method items, emails and virtual office hours for example, there were few differences with students either liking or disliking methods regardless of prior online experience.

Knowing that students differ in prior experience with online learning does not offer the most practical basis for the identification of particular groups of students. As previously noted, findings indicate that experience with online learning is associated with grade-level – grade level is a clearly observable, predictable characteristic around which online course design can be geared. Though not a perfect match, there is a tendency for freshman to have less online experience and students in higher grades to have increasingly more experience. Therefore, an online experience that provides for greater interaction with the instructor may be designed for freshman courses while an online experience that provides for engagement with other students may be designed for more senior and graduate courses. Findings also indicated a statistical association between experience with online learning and age and military background. Therefore, when there is knowledge that military students or older students may take a particular course, an online course may be designed accordingly.

Several implications can be drawn from these findings. First, the framework of online courses may not need to be radically different to accommodate differences in the student population. Rather, many commonly used instructional methods will have application across the board. Second, fairly modest though strategic tailoring of online instructional components, such as increased interaction between instructor and students for freshman and greater opportunity for interaction among peers for upper-level and graduate students, may reap dividends in appealing to a diverse student audience. The upshot of these first two implications might look like a common design framework with various components given adjustable weight in terms of emphasis. Third, rather than viewing the issue in bimodal terms (i.e., one design for lower-level undergraduate and another for upper-level and graduate students) instructional methods used in online courses may be varied across grade levels in a more fluid manner so that students can be brought along in stages – guided from the traditional classroom setting to a setting that encourages more peer interaction.

CONCLUSION

The current study is based on results of a 2020 survey that was conducted during the COVID-19 pandemic and at a precise point in what has become a rapidly changing online learning modality. Therefore, future research might consider several issues. First, this study's findings regarding a comparison of student opinions about online and face-to-face modalities are conditioned by joining face-to-face and blended modalities (i.e., face-to-face/blended). In the present analysis, therefore, reference to online is understood as fully asynchronous online (and as stated previously, the asynchronous modality was at the time of the survey Park University's dominant online modality). However, since the time of our survey, various hybrid modalities have emerged at Park University and elsewhere, such as asynchronous online combined with a synchronous web component. Future research, therefore, will need to examine various hybrid models to achieve a more complete view of student opinion about the various learning options available to them.

Second, this study's findings regarding online instructional methods are conditioned by the list from which students selected. Greater insight into those instructional methods that work, at least from the students' perspective, will be gained by adding to this list, particularly in light of various hybrid modalities that have emerged. Third, as noted, the survey was conducted within the context of COVID-19. There was a methodological benefit to asking students their opinion of online learning in a setting where most students had to take online courses; that is, we could ascertain the opinion of students familiar with online learning as well as newcomers to the modality. This said, as was society generally, students were under stress due

to changes in their home and work life, as well as their educational setting. While the data in this study cannot offer precise evidence that student stress influenced opinions on educational issues, likely the pandemic environment had some impact. In this regard, a post-COVID-19 survey would bring additional insight and clarification.

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