Pandemic Online Transitions:
Student Reactions, Adaptations, and Course Feature Preferences

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As COVID-19 forced higher education instruction online, it brought massive change for students, professors, and institutions. This research investigated student reactions, adaptations, and preferences for course features related to the abrupt transition to online course delivery. Three research questions guided this work:
1. *How did students react to online instructional formats necessitated by COVID-19?*
2. *How well did students adapt to online instructional formats necessitated by COVID-19?*
3. *What course features or factors impacted students' transitions to online instructional formats necessitated by COVID-19?*

Results indicated that students faced multiple challenges and showed variation in adaptation and preferences for course features.

INTRODUCTION

As the COVID-19 pandemic forced closures of businesses and moved instruction at all levels online, massive change came to the higher education industry, which educates nearly 20 million and employs nearly four million in the U.S. (Brownlee, 2020). While those already taking or teaching courses online experienced minimal alteration to their academic experience, others, including higher education administrators, and students enrolled in and faculty teaching on-campus face-to-face courses, were abruptly thrown into a crisis described by Ted Mitchel, president of the American Council on Education, an association of college presidents. He stated, "This crisis is causing massive disruption to students, institutional operations and finance. On some campuses, it is creating an existential threat, potentially resulting in [permanent] closure" (Binkley & Amy, 2020, p. 1). The Association of Public and Land-Grant Universities noted the somewhat obvious dilemma of sustaining effective academic delivery and that the pandemic additionally exacerbated the urgency of public higher education's biggest challenges, which include inadequate government funding, student mental health, diversity and inclusion, and affordability (Whitford, 2020). With respect to delivery of instruction, 90% had transitioned to online formats from

traditional formats, and fewer than half of these had any prior experience with teaching online (Gates, 2020). Hence, challenges to delivery and assessment of instruction were substantial, and included adjusting existing practices to teach online synchronously or asynchronously, transitioning content to a remote environment, providing virtual support and remediation to students, and maintaining the integrity of test and exam results and questions while providing online access. (Gates, 2020).

The purpose of this research was to investigate student reactions, adaptations, and preferences for course features related to the COVID-19 pandemic-induced cessation of on-campus instruction and abrupt transition to online course delivery. Three research questions guided this work:

1. How did students react to online instructional formats necessitated by COVID-19?
2. How well did students adapt to online instructional formats necessitated by COVID-19?
3. What course features or factors impacted students' transitions to online instructional formats necessitated by COVID-19?

BACKGROUND

Challenges for Students

Pandemic induced challenges to students were substantial. Course structures and delivery modes as well as personal life circumstances changed radically within days and weeks. The intersection between academic and personal changes taxed student adaptability and performance. Heightened impacts were felt by students of color and, with indigenous background, and from a low-income or working-class household (Anderson, 2020). Financial, practical, and psychological challenges and barriers appeared as students tried to learn remotely (Paxson, 2020). Barriers included (see Table 1):

TABLE 1
CHALLENGES FOR STUDENTS

Challenge Category	Specific Challenges
Family responsibilities (Acevedo, 2020)	Balancing parenting/going to college - doing all from home (Malcom, 2020)
	Juggling college studies with the care and home education of children as primary, secondary, and childcare facilities closed (Cruse, Contrera-Mendez, & Holtzman, 2020; Douglas-Gabriel, 2020; Malcom, 2020)
	Parental duties increased (80 Douglas-Gabriel, 2020). Nearly 4 million US undergraduate students are parents or guardians of children under 18 (Cruse, Contrera-Mendez, & Holtzman, 2020)
	Care for siblings (Hirt, 2020)
Isolation	Loss of personal interaction with faculty and classmates both in and out of classes (Binkley, 2020)
	Loss of rich campus experience (Bevins, et al., 2020)
	Curtailment of Greek life (Koenig, 2020)
Financial (Dickler, 2020)	Pandemic caused more financial stress for 60% of students (Redden, 2020)
	Hours or wage reduction for self or family members (Field, 2020; Hirt 2020) including 36% of families (Anderson, 2020) and 26% of students (off campus jobs) (Anderson, 2020)
	Loss of campus work-study jobs (Amour, 2020) experienced by 18% of students (Anderson, 2020)
Food (12 Cruse, Contreras- Mendez, &	Food insecurity "alarming" with 22% of undergraduates experiencing food insecurity (Anderson, 2020)

Challenge Category	Specific Challenges
Holtzman; Field, 2020)	Sixty percent experienced basic-needs insecurity. Rate was higher among Black (71%) and Hispanic (71%) compared to white (52%) students (Field, 2020).
Housing (Cruse, Contreras- Mendez, & Holtzman, Field, 2020)	Closure of campus dorms
	No money to get home or even a home to go to (Malcom 2020)
	Thirty percent moved to a new living situation (Redden, 2020)
	Thirty percent incurred unexpected living expenses from relocation to off-campus (Anderson, 2020)
	Overcrowded house or apartment as individuals share or return to housing (Hirt, 2020)
	Stimulus funding fell short of needs (Haber, 2020)
Instruction	Quick adaptation to online learning (Cruse, Contreras-Mendez, & Holtzman, 2020)
	Student and faculty disengagement (Klein, 2020)
	The reality of Zoom fatigue (Klein, 2020)
Mental Health	Higher rates of depression (Redden, 2020)
	Twenty-three percent found it "much more difficult" to access mental health care; 36.8% found it "somewhat more difficult" (Redden, 2020)
	Thirty percent compared to 21.9% from the previous fall reported their mental health negatively affected their academic performance on at least 6 days during the prior four weeks (Redden, 2020)
Physical health	Twenty six percent - very or extremely concerned about contracting the virus (Redden, 2020)
	Sixty-four percent - very or extremely concerned about a person they care about contracting the virus (Redden, 2020)
Technology access (Field, 2020)	Low speed Internet (Hirt, 2020)
	Laptop or computer access (Hirt, 2020)
	Families sharing devices to work remotely for employment with younger children and college students in remote school (Horn, 2020)

Challenges for Colleges and Universities

At the same time, colleges and universities experienced monumental threats including:

- Assuring health and safety of faculty, staff, and students (Cruze, Contreras-Mendez, & Holtzman, 2020)
- Preparing faculty for online teaching and supporting their effort
- Reduced fundraising by 10-30% (Whitford, 2020)
- Weakened endowments based on declining portfolio values and donation potential as a result of vast business closures (Hartocollis, 2020) and economic downturn (Whitford, 2020)
- Planning for anticipated loss of students: Up to 20% reduction in enrollment anticipated (Jaschik, 2020)

Top faculty challenges included keeping students engaged, providing additional support and remediation, administering secure tests, transitioning instructional content to remote environments, adjusting instructional practice to teach online, using video conferencing techniques, ensuring reliable internet access, grading and monitoring student learning, selecting new digital resources, becoming comfortable with digital tools, procuring hardware, and accessing instructional design resources (Gates, 2020).

Course Features and Tools

Student reactions to online instructional formats necessitated by COVID-19 showed both resiliency and nervousness. Through New York University's Learning Analytics Research Network (LEARN) spring 2020 study of 50 universities, 300 graduate and undergraduate students reported that, while initially 24% of them felt nervous, by May only 6% felt nervous (Wood, 2020). More generally, 28% eventually felt "okay" with remote instruction while 20% felt "resigned" to it (Wood, 2020).

Yet, all students were not so positive, based on the same study (Wood, 2020). Student ratings of overall learning experiences dropped from 4.47 on a five-point scale pre-pandemic to 3.11 in March and 3.67 by May 2020. Students experienced frustration, lack of motivation due to changing schedules, anxiety about missing deadlines, and loss of in-person interactions. They found it hard to focus, mental health was not stable, they had no designated study area, computer use was exhausting, and the change needed was disruptive. Other studies revealed additional stress and anxiety ensued because family challenges resulted in having no undisturbed time to study (Harris, 2020). Students expressed that video chats were more work, or at least felt as if they were more work. Video conversations felt exhausting, and communication without social cues as in face-to-face conversations were tough (Haber, 2020). Interestingly, students also shared that in-home video use provided an unsettling glimpse of personal life (Haber, 2020).

Course features and instructional tools influenced students' and instructors' adaptation to the forced transition to online courses. Previous work by the research team revealed that students vary in their preferences and use for online instructional tools (Goodson, Miertschin, & Stewart, 2012, 2015, 2016; Miertschin, Goodson, & Stewart, 2013, 2019; Miertschin, Stewart, & Goodson, 2017; Stewart, Goodson, & Miertschin, 2010, 2011, 2012, 2013; Stewart, et al., 2010; Stewart, Miertschin, & Goodson, 2020). During the pandemic, Vijay Govindarajan, professor at Dartmouth's Tuck School of Business expressed that online education via digital technologies can transform learning experiences. However, he found that was not happening automatically as instructors had about eight days to put everything they do in face-to-face classes online (Marcus, 2020). The technology education sector rallied to offer products and services free or with steep discounts anticipating sales later (Marcus, 2020). CARES Act funding for the Higher Education Emergency Relief Fund (HEERF) provided emergency financial aid to post-secondary institutions which could be used for many things, including to purchase newly required instructional technologies to support instruction (Brownlee, 2020). What emerged, predominantly and understandably considering the very short implementation time available, were courses that relied heavily on video conferencing to deliver courses in much the same way they were being delivered face-to-face (Wood, 2020). The LEARN study reported that video products such as Zoom were beneficial for lectures and class interactions through breakout rooms, while tools such as GoogleDocs & GoogleSlides helped with collaboration (Wood, 2020). In terms of devices used, pre-pandemic evidence showed that only 72% of students used desktops for academic work while 93% used laptops for academic work, with 28% reporting using tablets and smart phones (mobile devices) for academic work (Miertschin, Goodson, & Stewart, 2019). After the onset of the pandemic, Wood (2020), again, found students predominantly used their desktop or laptop (96%) for courses with only 14% using mobile devices (Wood, 2020).

The result of the rapid shut down of traditional format teaching and learning was a cacophony of course designs that sometimes met and sometimes fell short of student needs and expectations. Some positive students expressed that online learning provided opportunities to develop greater understanding of content by enabling resources and recorded lectures to be viewed multiple times (Wood, 2020). Online learning, which was seen to provide more flexibility in time management prior to the pandemic (Goodson, Miertschin, & Stewart, 2015; Goodson, Miertschin, & Stewart, 2016; Miertschin, Goodson, & Stewart, 2013; Stewart, Miertschin, & Goodson, 2020), was confirmed by students to continue to provide more flexibility (Wood, 2020). To mitigate the negative aspects of online delivery, faculty scrambled to be inventive and responsive (Gordon, 2020). Online video or audio material was produced and delivered by some in shorter segments of 10 to 15 minutes to retain student attention and personal touches were enhanced via strategies such as online chat groups and virtual office hours (Gordon, 2020). Laptops, Internet hotspots, and other tech tools were provided for students as needed (Brownlee, 2020).

Students expressed strong needs not only for instructional support, but also emotional support during the transition. Sixty-nine percent said campus administration had been supportive during the pandemic and 78% felt professors had been supportive (Wood, 2020). They wanted empathy, understanding of the abnormal situation, advice about future academic goals, less emphasis on exams with more emphasis on course material, guidance to create strong and collective participation, easing of the workload, patience, and understanding and value for the individual (Harris, 2020). Students valued and appreciated faculty who communicated, offered structure and flexibility, tried to provide high quality education, and engaged students with material even if unavoidable issues occurred (Wood, 2020).

Services and Factors Impacting Student Transitions

To support student transitions, experience, and learning, colleges and universities initiated or reinforced student services. Indeed, 69% of students said campus administration had been supportive during the pandemic (Redden, 2020). These services included (see Table 2).

TABLE 2
SERVICES AND FACTORS IMPACTING STUDENT RANSITIONS

Service Category	Specific Services
Alterations	Grading practices including pass/fail grade systems (Marcus, 2020)
Technology supports	Laptop and technology loaner or free programs (Amour, 2020; Brownlee, 2020; Field, 2020; Horn, 2020; Nadworny, 2020; Redden, 2020)
	Internet access including: Expansion into campus parking lots (Amour, 2020) and off-campus Wi-Fi provision (Field, 2020)
Financial assistance	Emergency grants and financial aid (Amour, 2020; Douglas-Gabriel, 2020; Hirt, 2020; Redden, 2020)
	Free tuition for local students (West, 2020)
	Scholarships (Brownlee, 2020)
	"Clean Slate" elimination of students' outstanding account balances up to $500 (Redden, 2020)
	Free summer classes (Field, 2020; Redden, 2020)
	Reduced payment plans (Redden, 2020)
	Foundation funds to pay bills (Amour, 2020)
	Extended job resources to family members (Anderson, 2020)
Food assistance	Food banks and pantries (Douglas-Gabriel, 2020; Field, September 18, 2020)
	Gift cards for groceries (Field, September 18, 2020)
	Food delivery (Anderson, 2020)
Housing and study space	Hotel space to facilitate social distancing for dorm residents (Sperance, 2020)
	Gym use as study halls (Amour, 2020)
	Residence location (Field, 2020)
	Provided rent (Field, 2020)
Counseling and advising	Social services advising and referrals (Douglas-Gabriel, 2020)
	Mental health counseling (Anderson, 2020; Kraw, 2020)
	Mentor programs (Hirt, 2020; Field, 2020; Lauterborn, 2020)
	Aggressive academic advising (Whitmire, 2020)
	Virtual "hand holding" (Field, 2020; Whitmire)
	Increase communications including text messaging and use of chatbots (Field, 2
	Telehealth for health advising (Anderson, 2020)
Social support	Embraced virtual campus activities while staying safe (e.g., homecoming concert via live stream) (Amour, 2020)

METHODOLOGY

Mid-semester in spring 2020, the declaration of COVID-19 as a global pandemic happened, forcing universities to stop face-to-face contact and switch courses to online formats. At the conclusion of the spring 2020 semester, a survey of 511 students was completed to better understand student adaptation to the sudden change in course format. Analysis of the survey was directed at how students adapted to this sudden change.

Survey Instrument

A thirty-two-item questionnaire was developed by the research team. Survey questions were categorized in three primary areas: a) demographics and background, b) transition inquiries, and c) course feature preferences. Demographic and background items included class level, number of online courses completed, most consistent course format, number of courses enrolled for spring 2020, number of courses originally in face-to-face or hybrid format for spring 2020, age, GPA, employment status, gender, and major. The transition to online format items included reaction to courses moving to online format, adaptation to online format, effect on semester grades, and effect on content learning. Course feature preference included course instructional tools preferred (e.g. instructor video lectures, non-instructor videos, computer games, computer simulations, student online presentations, e-text content, collaborative activities, online discussions, lectures with clicker use, downloadable course materials, contacts for technical support, prompt e-mail responses, and timely grading). Additionally, data was collected on the overall impacts of the pandemic on participants and factors that enabled them to successfully complete courses.

Data Collection and Analysis

Participants were enrolled in undergraduate courses at a Carnegie-designated research university in the United States. The survey was administered on-line through the learning management system (Blackboard Learn). Students were asked to complete the survey, with the understanding that completion of the survey was voluntary, and all responses were anonymous. The students were instructed to answer the questions with respect to their college learning experiences, in general, and not with respect to the specific course that delivered the survey.

Completed questionnaire data was extracted from the course websites for analysis. Item responses were tabulated, and tables, graphs, and descriptive measures were used to analyze and present the results. The open-ended responses were analyzed using the standard text analysis method of keyword extraction followed by tabulation.

STUDY RESULTS

The analysis was designed to consider the following issues as reflected in the research questions.
- What was the first reaction of the students to a totally OL format?
- How did students perceive their adaptation to a total OL format?
- Is there a relationship between adaptation and students' first reaction?
- What is the relationship between perceived adaptation and other factors including: classification, normal class format, age, GPA, and number of face-to-face courses in spring 2020?
- What is the relationship of the students' adaptation to the perceived benefit of some of the tools?
- What were some of the problems experienced by the students as a result of the pandemic?

Demographics

Seventy-three percent of the participating students were junior or higher classification. Overall, 56% of the students reported a GPA greater than 3.0. Thus, the participants were largely experienced, successful students. Approximately 90% of the students were under 30 years of age. Forty-four percent of respondents

were women and 56% men. The students surveyed were also experienced in online learning in that 57% of them had completed at least three online courses, while only 10% had completed no online course.

First Reactions and Adaptation

In asking students to identify their first reaction to the change to online format it was determined that there was a spread of reactions. One-fourth of the students expressed concern while a third of them were relieved. Twenty percent did not perceive that they adapted well, while 41% reported that they adapted well. There appears to be some consistency between the initial reaction to the change and perceived level of adaptation (see Table 3 and Figure 1).

TABLE 3
**STUDENTS' FIRST REACTIONS AND ADAPTATION TO ONLINE FORMAT CHANGE**

	Adaptation			
First reaction to OL	Not Well	No Change	Well	Total
Concern	11%	9%	6%	26%
Indifference	7%	22%	11%	41%
Relief	1%	8%	24%	33%
Total	20%	39%	41%	100%

FIGURE 1
STUDENT ADAPTATION BY INITIAL REACTION
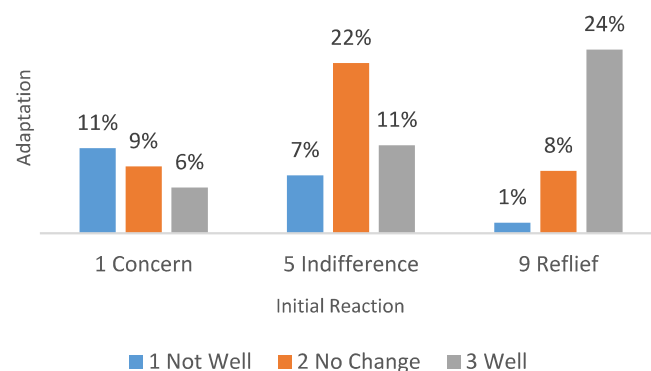
To further investigate adaptation, the relationship of perceived adaptation and various factors affecting the students was explored. Factors that were considered relative to the perceived adaptation to total online format included: classification, class format during their enrollment at the university, age, estimated overall GPA, and the number of face-to-face courses for which they were enrolled during the spring 2020 semester (see Figure 2).

FIGURE 2
FACTORS INFLUENCING PERCEIVED ADAPTATION
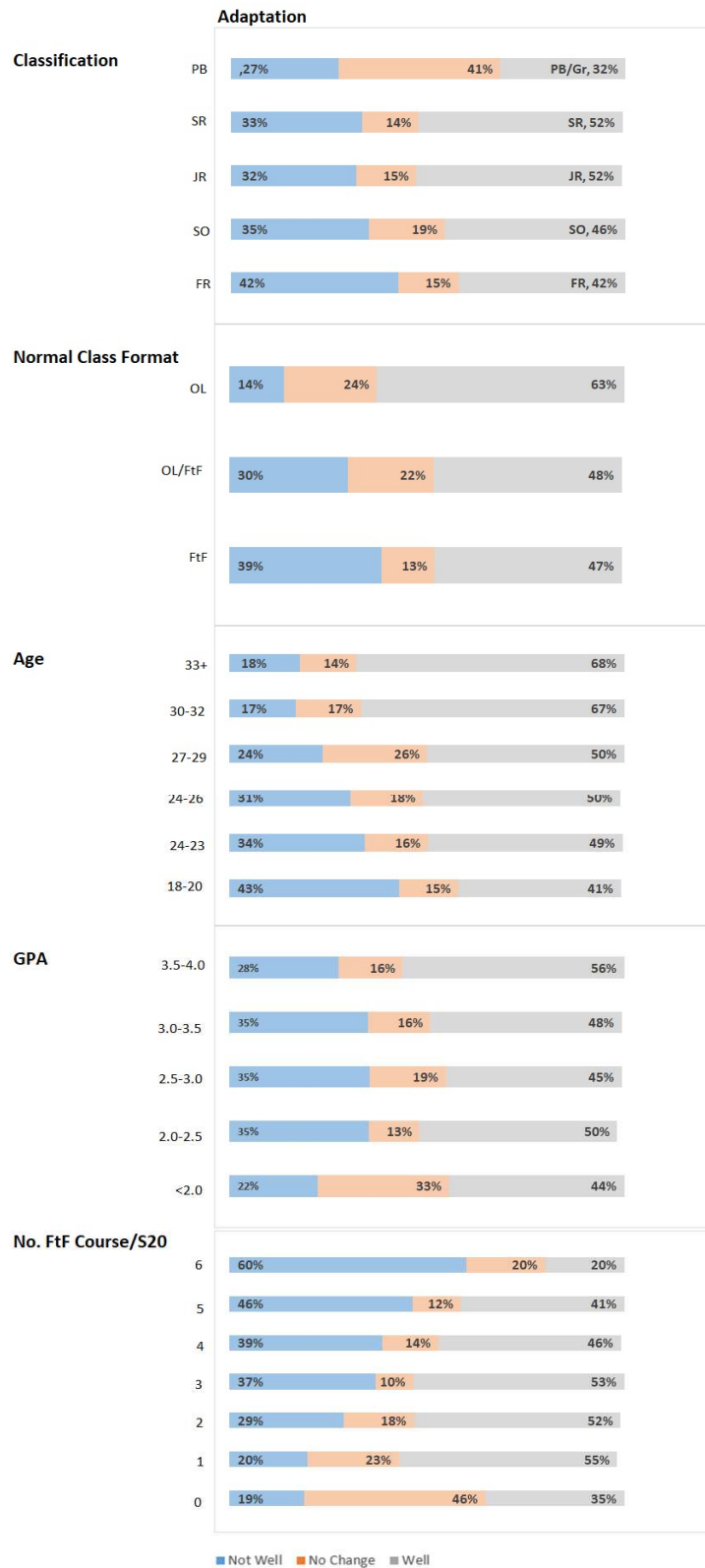
A review of the results indicates the following:

- Students classified as Junior or Senior perceived that they adapted well; Freshmen appear to have experienced the most difficulty in adapting.
- Students who normally enrolled for online classes while at the university adapted well; those who normally took face-to-face or hybrid courses indicated more often that they did not adapt well.
- Older students (30 years or more) adapted well with a greater percentage. Those having the greatest adaptation issues were under 20 years of age.
- Overall grade point average did not seem to affect perceptions of adaptation.
- As the number of face-to-face or hybrid courses (i.e., original format was not online) for which a student was enrolled increased, their perception of adaptation decreased.
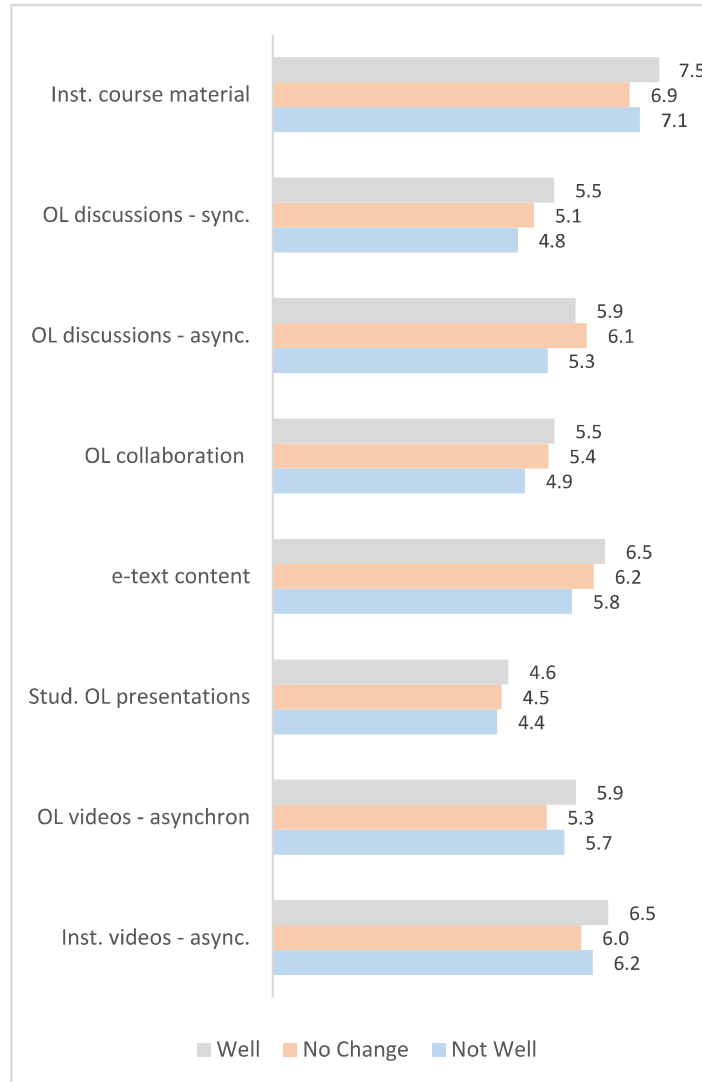
Course Features

Additional considerations of adaptation were the instructional course features applied in the online courses. Considering the mean usefulness of the tools, most students preferred course materials (e.g. slides, examples, etc.) that were developed by the instructor. The least favorable course feature was student online presentations (see Table 4).

TABLE 4
RANKED STUDENT PREFERENCE FOR COURSE FEATURES

Tool	Mean	Standard Deviation
instructor course materials	7.3	1.9
lectures captured as videos - asynchronous	6.3	2.2
e-text content	6.2	2.3
online discussions - asynchronous	5.8	2.3
videos from free online source- asynchronous	5.7	2.2
online collaboration	5.3	2.4
online discussions - synchronous	5.2	2.3
student online presentations	4.5	2.4

In viewing the value of instructional tools or course features by adaptation, instructor materials were favored by all adaptation groups, followed by asynchronous instructional videos. The least favorable tool was student online presentations for all adaptation groups (see Figure 3).

FIGURE 3
MEAN PERCEPTION: VALUE OF INSTRUCTIONAL TOOL BY ADAPTATION

Personal Impacts of COVID-19

Beyond course features and other academic related considerations, personal circumstances were likely to have contributed to student experiences during the spring 2020 semester. Students reported multiple personal impacts resultant from COVID-19 (see Table 5).

TABLE 5
IMPACTS OF COVID-19 ON PARTICIPANTS

Which of the following have you experienced as a result of the pandemic (mark all impacts that apply or chose 'No Impacts').

Increased difficulty in study from home	67%
Anxiety	65%
Household income decrease	48%
Job loss	35%
Increase workload/work hours on the job	20%
Household contracted COVID-19	5%
No impacts	5%
Other	25%
NR	1%

N=511

Factors that Enabled Course Completion

Finally, an open-ended inquiry also allowed students to record other factors that enabled them to successfully complete courses after the transition to an online format. Responses included: communication and understanding from the instructor, flexible due dates, and support from a partner or advisor (see Table 6). Recommendations for improvements were also given including more training for faculty in online delivery and more online resources.

TABLE 6
OTHER FACTORS THAT ENABLE OR IMPACTED COURSE COMPLETION

Category	Category Description	# Responses
Communication	Instructor communication and understanding	8
Same	No change since courses were all or mostly OL	7
Extra Time	Flexible due dates	6
Support	Support from partner or advisor	2
Not Successful	Transition was not successful for the student	4
Improvement	Student recommended improvements*	3

Note: 37 comments from 30 students

DISCUSSION AND RECOMMENDATIONS

The transition to online courses in the spring of 2020 spurred substantial reactions and adaptations for students. The findings of this research indicate that while 26% of students were concerned about the change to all online courses, 33% were relieved by the move. Forty-one percent reacted with indifference. The response, then, to research question #1 is that, in general, while some students were concerned about the change to online coursework, most were either indifferent or relieved. These findings are similar to those reported by the New York University Learning Analytics Research Network' (LEARN) study that initially 24% of students felt nervous (Wood, 2020). Considering the multiple changing life contexts brought by COVID-19 to individuals, families, and work environments, it is difficult to ascertain the influences that

undergird students' reactions. That merited further investigation in this study and prompts future consideration.

Research question #2 drove investigation of the adaptation of students to the change in course format necessitated by COVID-19. In summary, 41% felt they had adapted well and 20% reported that they had not adapted well. While not exactly the same, the LEARN study had reported that eventually 20% of students felt "resigned" to the new course formats (Wood, 2020). This has serious implications for faculty and institutions as they strive to meet student learning needs. Adjustments and alterations must be made so that all students succeed at adapting. For greater understanding, the research team examined the relationship of other factors on students' perceived adaptation. The findings that while juniors and seniors adapted well, freshmen appear to have had the most difficulty adapting may recommend increased focus directed to freshmen. Not surprising was the result that students who normally enrolled in online classes adapted better than those who normally took face-to-face or hybrid courses. Students with historical online enrollments had already developed the skills needed to learn in this format. This coincides with the finding that as the number of currently enrolled face-to-face or hybrid courses increased, perception of adapting well decreased. The outcome that younger students were less likely than older students to adapt well prompts additional questions. Even though younger students may have been or were expected to be just as or even more acclimated to digital technologies, was it life experience that facilitated adaptation for the older students? And, if so, can the concept of life experience be broken down into factors for examination? This offer opportunities for exploration.

Reaching for greater detail in course design, research question #3 motivated inquiry about course features or factors that impacted students' transitions to online instructional formats necessitated by COVID-19. While instructor created course materials (mean 7.3), video lectures (6.3), E-text content (6.2), asynchronous discussions (5.8), videos from online sources (5.7), online collaboration (5.3), online discussions (5.2), and student online presentations (4.5) all had positive impacts on student adaptation, mean values showed that students most preferred materials prepared by the instructor. This certainly suggests that students value the expertise and connection of faculty

While knowing student reactions and perceived adaptation to the change as prompted by the three research questions of this study is critical to understanding the student experience and preparing for the future, more contextual information is also useful since students interact with their learning based on their greater life environments. Hence, knowing that students were experiencing anxiety (27%), household income decrease (21%), increased difficulty in study from home (21%), job loss (13%), increased workload/work hours on the job (6%), and self, family, or household member having contracted COVID-19 (5%) is valuable. These findings are solidly in concert with the abundance of challenges listed in both popular and educational literature (Acevedo, 2020; Anderson, 2020; Bevins, et al., 2020; Binkley, 2020; Brownlee, 2020; Cruse, Contrera-Mendez, & Holtzman, 2020; Douglas-Gabriel, 2020; Field, July 16, 2020; Field, September 18, 2020; Haber, 2020; Hirt, 2020; Klein, 2020; Koenig, 2020; Malcom, 2020; Redden, 2020). Wise academic leaders have and will continue to provide diverse support systems and programs to foster student success (Amour, 2020; Anderson, 2020; Brownlee, 2020; Douglas-Gabriel, 2020; Field, July 16, 2020; Field, September 18, 2020; Horn, 2020; Hirt, 2020; Kyaw, 2020; Lauterborn, 2020; Marcus, 2020; Nadworny, 2020; Redden, 2020; Sperance, 2020; West, 2020; Whitmire, 2020).

Similarly, as faculty and instructional designers strive to create courses that meet student needs during this pandemic and beyond, knowing the positive course factors listed by students has implications. The value for communication was reinforced, as were needs for flexible due dates and support from others. Not only during times of pandemic-induced stress do students need interpersonal communications, flexibility, and support, but always.

In summary, the reactions and challenges expressed by students in this survey confirm and extend those outlined in the professional and educational literature. As educators seek to mitigate the negative attributes of the sudden move to online instruction forced by the pandemic, the experiences shared here are useful and provide background for improvements. Illumination of students' reactions and adaptations as well as preferences for course attributes and desired supports will pave the way for the creation of online learning environments that more fully enable student success.

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