"Messy transitions": Students' perspectives on the impacts of the COVID-19 pandemic on higher education

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Abstract

The COVID-19 pandemic affected every area of students' lives, especially their education. Limited research has explored students' experiences during the pandemic. This study documents how students across seven United States universities viewed the impact of the COVID-19 pandemic on their educational experiences and how these students reacted to these impacts. We present qualitative data from an online survey conducted between March and May 2020 that resulted in 1267 respondents with relevant data. Conventional content analysis with an inductive approach was used to analyze open-ended responses to the question, "We are interested in the ways that the coronavirus (COVID-19) pandemic has changed how you feel and behave. What are the first three ways that come to mind?" Six categories emerged from the data: changes in instruction delivery mode, changes in schedule and everyday life, increased technology use, decreased academic opportunities and resources, negative reaction to the changes in higher education, and positive reactions to changes in higher education. Among our recommendations for practice are personalized approaches to material delivery and evaluation, synchronous classes and opportunities to connect with professors and students, and convenient support services.

Keywords Coronavirus · COVID-19 pandemic · College experience · Higher education · Qualitative analysis

Introduction

In March of 2020, the operation of higher education institutions changed suddenly and dramatically. Within mere weeks, the COVID-19 virus spread across the world bringing uncertainty, confusion, and fear into every area of life, including the educational system. Unprecedented challenges were placed on students, faculty members, and administrators in higher education (Moralista & Oducado, 2020; Stewart, 2020), such as the need to balance

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a variety of financial challenges, emotional and mental stressors, safety-related concerns, and ongoing provision of high-quality education curricula. College/university students in the U.S. were required to rapidly move away from their physical campuses – in some cases without sufficient time to gather belongings – and find places to quarantine (Adnan & Anwar, 2020). Simultaneously, many students were tasked with ensuring the safety of their family members, dealing with the potential stress and loss of loved ones, adjusting to the conditions of social distancing and isolation, and, in some instances, serving as the main caregivers for family members (Browning et al., 2021, Conrad et al., 2021; Lederer et al., 2020, Neuwirth et al., 2020). These extracurricular demands were exacerbated by the additional stress resulting from changes in their education.

Academic institutions reacted to the COVID-19 pandemic in various ways, but the majority moved to fully online classes (Marsicano et al., 2020). This move was challenging due to the limited transition time, considerable resources required to implement the change, need to act quickly in a state of emergency, and general panic associated with the pandemic (Neuwirth et al., 2020). As a result, students experienced stress associated with limited resources, lack of access to high-speed internet and reliable technology, cancellation of valuable educational experiences not readily available online (i.e., class trips and service learning), disconnect from peers and the larger campus community, and need for self-regulation in times of anxiety and uncertainty (Lederer et al., 2020; Stewart, 2020). These challenges were amplified by a sense of uncertainty about when, how, and whether a state of normalcy would be restored (Neuwirth et al., 2020).

The currently available descriptions of student reactions to these changes in education during the pandemic are limited and often anecdotal (Lederer et al., 2020; Neuwirth et al., 2020). The available data are largely from students engaged in a single major, such as medicine (Chandratre, 2020) or public health (Armstrong-Mensah et al., 2020), or from small samples of students at a single university (Aguilera-Hermida, 2020). A better understanding of students' reactions is critical to inform university administrators about how these stakeholders witnessed this transition. Such improved understanding may inform changes in policy and practice to better address the needs of students and the academic community at large (Vlachopoulos, 2020). Therefore, in this study, we explored how students across seven U.S. universities viewed the impact of the pandemic on their educational experiences and how these students reacted to these impacts during the early stages of the pandemic.

Literature review

Challenges and opportunities of online education

While various societal changes and technological advancements encouraged colleges and universities to offer more online education before the pandemic, faculty acceptance of this transition was slow (Allen & Seaman, 2012). In the 2000s and 2010s, globalization, the information economy, and technological innovations prompted large increases in online class enrollment. For example, in 2006, almost 20% of U.S. university students were taking at least one online course (Online Learning Consortium, 2007). By 2017, over 15% of U.S. university students were enrolled in fully online education and another 30% were enrolled in at least one online course (Bustamante, 2020; Chaloux & Miller, 2014). Despite these increases in online education, many higher education institutions

and faculty members were unreceptive to implementing technology in their courses or using online learning. For example, a study by Allen and Seaman (2012) revealed that "professors, overall, cast a skeptical eye on the learning outcomes for online education" (p. 2), with two-thirds stating that the learning outcomes of an online course were inferior or somewhat inferior to face-to-face courses. In that study, only faculty members who had experience teaching online viewed it positively. These findings revealed the reluctance of university faculty across the U.S. to meet shifting educational paradigms, as well as highlight that online education prior to the pandemic was often viewed as problematic.

The rapidly expanding online programs also catered to different students prior to the pandemic. Students enrolled in fully online programs were more likely to be at least 24 years old, employed full-time or part-time, and married or had children compared to students enrolled in traditional, in-person programs (Stavredes, 2011). Older students were viewed differently by their professors as well; these students were seen as more motivated, pragmatic, self-directed, and task-oriented than younger students (Beder & Darkenwald, 1982).

Many faculty members were limited in their knowledge of strategies to engage students in online learning prior to the pandemic. Multiple strategies to provide high quality online education had been proposed (Schrum & Hong, 2002; Stavredes, 2011). In particular, the principles of andragogy or adult-learner-centered approaches were often advised as a best practice for online education (Knowles, 1972). These principles center on promoting intrinsic motivation, pragmatism, self-concept, readiness to learn, applications, and previous life experiences in their pedagogy, with decreasing controlling and structuring behaviors (Beder & Darkenwald, 1982; Knowles, 1972). This approach is very different from traditional in-person education strategies in part because traditional university students are in their early 20s, have fewer responsibilities outside of the classroom, and possess limited professional experience (Knowles, 1972). Additionally, due to generational changes, recommended teaching strategies in recent years focused on motivation, development of independence, and student engagement (Barclay, 2001; McKeachie & Svinicki, 2013). As these examples suggest, strategies used by faculty members who taught courses in online programs and those who taught in traditional, in-person programs were often different. This further highlights the complexity of moving from in-person to online education, especially during the conditions of the COVID-19 pandemic (Moralista & Oducado, 2020; Watermeyer et al., 2021).

Impacts of the COVID-19 pandemic on higher education

The COVID-19 pandemic radically changed higher education processes as a result of colleges and universities transitioning to fully online education. For example, Canada was complimented for supporting graduate students' research to ensure timely graduation (Jenei et al., 2020). Canada also established a national campaign to assist with data collection for graduate students, entitled the National COVID-19 Volunteer Recruitment Campaign (Jenei et al., 2020). Canada further developed infrastructure to support educational progress, providing less expensive higher educational degree plans. As a comparison, the U.S. university system, which relies heavily on student loans, continued to be economically burdensome to students (Jenei et al., 2020). Despite Canada's infrastructure for supporting graduate students (Jenei et al., 2020), international students and Indigenous students experienced additional obstacles in continuing their education. Both international

and Indigenous students experienced stress associated with being away from their families and communities where COVID-related challenges were dire, and where federal aid for international students in Canada was not available (Jenei et al., 2020).

Perhaps the most accurate way of describing the transition to online education is "emergency remote teaching" (Bozkurt & Sharma, 2020). This phrase illustrates how faculty members and administrators had to develop and deliver effective online education within the context of an emergency response (Adedoyin & Soykan, 2020). Faculty members, administrators, staff, and students all had to make significant adjustments to their everyday lives in a very short period of time.

Students in particular were challenged by where and how to access online educational material, as well as other demands. Access to private and quiet places with high-speed internet was a major challenge for many students (Neuwirth et al., 2020). Low-income and rural students, as well as students with families in distress or who lived far away, had the most difficulty with accessing online material (Neuwirth et al., 2020). Most students were challenged by the lack of privacy resulting from household or caregiver responsibilities (Aguilera-Hermida, 2020; Browning et al., 2021; Neuwirth et al., 2020).

Stress, uncertainty, danger and social isolation also impaired students' ability to engage in online education (Lederer et al., 2020; Neuwirth et al., 2020; Woolston, 2020). Depressing news reports, fear for and loss of loved ones and financial concerns often left students unmotivated and unable to engage with their classes (Aguilera-Hermida, 2020; Lederer et al., 2020; Neuwirth et al., 2020). Isolation caused students to feel depressed, worried, trapped, apathetic, and unproductive, which may have further limited engagement.

Further exacerbating students' challenges were faculty members' own challenges. Faculty members struggled with identifying students in need of additional assistance during asynchronous classes and when students turned off their web cameras (Neuwirth, et al., 2020). Many instructors experienced stress themselves when learning new technology, providing extra accommodations and support to students, working extra hours, and working more at home due to unexpected caretaker responsibilities (Moralista & Oducado, 2020; Neuwirth et al., 2020). These changes were likely to influence students' experiences due to faculty members' decreased capacity to deliver effective coursework, as well as faculty's concerns about the value of online education (Moralista & Oducado, 2020). As a study by Watermeyer et al. (2021) revealed, although the majority of instructors felt supported by their institutions in the transition to online education during the pandemic, only about 50% felt prepared to deliver online learning, teaching and assessment.

A small but significant number of students reported positive impacts of the pandemic on their educational experience (Armstrong-Mensah et al., 2020). These impacts included decreased commuting time and expenses, more time with family, more time to complete assignments, increased flexibility regarding assignment deadlines, and more time to rest (Armstrong-Mensah et al., 2020). Some students also reported that their education did not suffer from the move to online coursework as long as faculty members communicated course expectations, provided the required materials and assignments, and were available to meet virtually (Armstrong-Mensah et al., 2020). Interestingly, a study by Gonzalez et al. (2020) showed improvement in student performance during the pandemic. The authors explained this unexpected finding by changes in students' learning strategies to more habitual behaviors. Although such studies have started to document students' experiences during the pandemic, the current study presents a more diverse set of results covering a myriad of student perspectives across multiple geographical locations.

Methods

The data presented in this paper were collected as part of a larger research project focused on the impacts of the COVID-19 pandemic on students at seven large public universities across the U.S. These universities included Arizona State University, AZ (190 students invited to participate), Clemson University, SC (1,168 invited), North Carolina State University, NC (10,000 invited), Oregon State Unviersity, OR (1,207 invited), Pennsylvania State University, PA (141 invited), University of Montana, MT (847 invited), and The University of Utah, UT (621 invited). A detailed description of the universities sampled can be found in Browning et al. (2021). Here, we present the qualitative data of the online survey conducted between March and May 2020.. During this time, there was much uncertainty about education and future employment opportunities, technological issues and social isolation. The survey was sent to a total of 14,174 graduate and undergraduate students and resulted in 2,534 completed responses. Of these, 1,514 quotes (coded fragments) from 1,267 students were available for qualitative analysis. Considering the modest response rate (9%) and qualitative data analyzed here, we did not aim to represent the larger student body across the U.S. Rather, our goal was to allow students to speak for themselves and allow their voices to be heard. While this study was exploratory in nature, our attempt at a rapid response to data collection may provide faculty and university administration with valuable and timely information on the experiences of students in the first wave of the pandemic. To help orient the audience about the participants in this study, we provide demographic information of the participants (Browning et al., 2021).

The majority of respondents self-identified as non-Hispanic White (79%), while the rest of the sample was split among students who self-identified as non-Hispanic Asian (13%), non-Hispanic Black (4%), and Hispanic (4%). Students pursuing undergraduate degrees represented 81% of the sample, while graduate students represented 19% of the sample. Females represented 61% of the sample and young people 18–24 years of age represented 79% of the sample.

The open-ended qualitative data for the present analysis were retrieved from student responses to a single survey question. We asked: "We are interested in the ways that the coronavirus (COVID-19) pandemic has changed how you feel and behave. What are the first three ways that come to mind?" Three responses were requested, and a fourth response was optional.

We used conventional content analysis with an inductive approach to analyze these open-ended responses (Lune & Berg, 2017; Maxwell, 2012). Two independent researchers systematically evaluated the data with the goal of generating patterns and themes (Lune & Berg, 2017). We completed two rounds of data analysis (Creswell & Miller, 2000). First, two researchers analyzed the whole dataset to create codes related to changes experienced by students during the pandemic (e.g., changes in education or uses of technology). Second, we analyzed codes related to changes in education in greater depth. We assigned at least one code (labelled as "primary") or two codes (labelled as "secondary") to each quote (coded fragment). After completing the coding separately, the two researchers reviewed the data for agreement (Creswell & Miller, 2000; Hruschka et al., 2004). Interrater/intercoder agreement (kappa) score indicated a very high level of agreement at 99% (McHugh, 2012). The codes were then grouped into six categories based on similarities and differences (Erlingsson & Brysiewicz, 2017).

Results

The researchers identified six categories that appeared in the data (Table 1). The first four categories described students' beliefs on how the COVID-19 pandemic changed their educational experiences, including changes in instructional delivery mode, schedule and everyday life, technology use, and academic opportunities and resources. The last two categories described how students reacted to these changes and included positive and negative responses. Although the focus of these categories was different, there was some natural overlap related to changes in education and students' reaction to these changes. We assigned primary and secondary code to each quote and used primary codes to create the categories. The following sections define each category and provide examples of student responses.

Changes in the mode of delivery

Changes in the mode of delivery was one of the most prominent codes emerging from the data, with 17% of the quotes referring to this change. While some students' classes were postponed or even canceled, the majority of students had to switch to online classes. As one of the students stated, "It has forced me to go to all online school which I am not very happy about." Many students reflected on the quality of education they would receive and expressed concern about their ability to be successful in an online modality. For example, one of the students stated, "I am worried the quality and extent of my education has been greatly compromised." Students did not know what to expect from online education and wondered whether online education would work for them. As one of the students stated, "It has taken me out of my usual learning setting making me feel unsure of how well I will do." For some students, online delivery "made school less pleasant" and "far less enjoyable," and forced them to learn new skills. As several students reported, "I am adaptable." However, there were also students for whom the change was more dramatic. For example, students had to drop classes or even change their major. In their words, "I will need to drop my classes for the time being, since online classes are not manageable." Other students mentioned that this transition "Decreased the likeliness of ever taking an online class again." Several students commented on other changes that were happening and the lack of certainty about the process. For example, students described: "Classes have altered so much it feels like starting a new semester," "Ambiguous environment (confusing online classes)," "Messy transition to online classes," and "Things like school and exams don't feel as real as they used to."

The transition to online coursework was also associated with other changes in their lives, like place of residency and graduation date. As one student stated, "Schooling became online and I moved back home." Students overwhelmingly found this change was inconvenient. In the words of one of the students, "I cannot be at school where I want to be for many reasons."

Changes in schedule and everyday life

Changes in schedule and loss of everyday life routines were mentioned in 10% of students' responses. Students reported that the COVID-19 pandemic caused them to "develop new habits good and bad." Some students reported having "less leisure time,"

Table 1 Emergent themes from student perspectives on how the COVID-19 pandemic impacted higher education

Categories	Codes	Frequency (% of all code fragments)
Changes in mode of delivery	Changes in mode of delivery/move to online education	270 coded fragments (17%)
Changes in schedule and everyday life	Changes in activities, decreases in structure, changes in the concept of time, work-life balance	166 coded fragments (10%)
Changes in technology use	Increases in technology use, technology use for communication, technology use for entertainment	88 coded fragments (5%)
Changes in academic opportunities and resources	Decreases in instructors' guidance, absence of peers, absence of tutoring, absence of research opportunities, absence of other academic resources, internet access	74 coded fragments (5%)
Negative response	Decreases in productivity, decreases in motivation, decreases in focus, decreases in ability to learn, concerns about projects, concerns about grades/performance in school, concerns about the future, feeling lethargic, procrastinating	846 coded fragments (52%)
Positive responses	Increases in happiness, increases in time, increases in freedom, slow living, increases in reflectivity, increases in adaptability, increases in creativity, increases in productivity, increases in focus	184 coded fragments (11%)

and "less personal time," while struggling to find new work-life balance. For example, one student stated that there were "No transitions between work, school, and life." Other students reflected, "I feel like I should always be working because I'm at home." While such changes in schedules and routines may be an outcome of high stress, isolation, and fear of the unknown associated with the pandemic, the opposite effect may be possible too. The changes in schedules and routines could potentially lead to more stress, restlessness and inability to focus.

Students sometimes reported that they maintained their routines for their mental health. As one student shared, "I've realized how important routines are for me. I have been trying to keep up the routine I had in college, and it's one of the only things keeping me sane throughout all of this." Another student added, "I tell myself that nothing has changed and try to stick to a regular routine even if I'm only working from home."

Although several students were successful at developing and maintaining new routines, others found it to be challenging. One student revealed that "I attempted to move toward a more structured schedule or plan every day. Sometimes I'm successful and other times not so much." The following quotes show that the inability to maintain a schedule affected students' performance in school, as well as their health: "I have less of a routine now which affects my productivity," "I feel less healthy/normal because of lack of regular routine," and "Loss of routine changed sleep and eating schedule and quality." This lack of schedule and routines led to changes in the concept of time. As some participants explained, "I have lost the concept of time, as my days seem as though they are blending together," "I feel like each day is blending into the next," and "Time feels meaningless, and I'm awake/sleeping at random times."

Changes in technology use

As a result of the move to online education, the increase in technology use was reported by 5% of participants who described "increase in screen time, time online or on Zoom, phone or laptop use." As one of the students described, "Constantly using technology 24/7." Similarly, another student shared, "Everything work or school related is on a screen now, competing for time within the limit I will allow myself to sit in one spot." Other participants described: "I spend way more time on technology and looking at screens either for school or because I'm bored which I hate," "Staring at a computer for all of my classes gives me a massive headache almost every day," and "Constantly on screens for webinars and meeting, getting eye fatigue and bad sleeping habits."

Students indicated that technology allowed them to stay connected with their friends and family and a learning experience. For example, one student stated that "I have become a much more effective telecommunicator." Students reported communicating with their families (i.e., "Want/need to FaceTime with family more than ever"), close friends (i.e., "I am on social media more to connect with my friends"), and more distant friends (i.e., "More online communication with long distance friends").

Students also reported "escaping on my computer" and using technology for entertainment. They reported "watching more Netflix, YouTube videos, movies and TV, listening to podcasts." Video gaming was used for entertainment and social interaction (i.e., "I'm playing more video games with friends").

Changes in academic opportunities and resources

Some students (5%) indicated that there was a "loss of access to university resources" provided to them on campus. Among the resources students listed as necessary for their success were instructors' guidance and support, tutoring services, peer interaction and group work, research opportunities and lab experiences, internet access, and other academic resources. While universities made numerous changes and improvements in their functioning during the pandemic, the supplemental resources and opportunities discussed by students were often difficult and sometimes impossible to effectively provide online.

Decreases in instructors' guidance were associated with the switch to online education. Some students stated that the lack of consistent interaction with instructors made school less engaging: "Lectures become much more mundane without a professor standing in full view and class participation encouraging the lecture." Other students indicated that connection with and guidance from instructors outside of the classroom was difficult to obtain online. As one participant shared, "I am forced to use online office hours which is difficult to debug/discuss my projects." For some students, when synchronous lectures were absent, "Schoolwork seems like it has lost all instruction and most of my classes are strictly homework and self-teaching."

Lack of academic assistance and tutoring was another change related to student's inability to access resources on campus. In the words of one student, "I am really nervous about the semester because I'm struggling in physics and now the tutoring centers are closed, and I can't afford online tutoring services without a job." Students also missed the opportunity to work with their peers. As some of them stated, "No in-person contact with classmates" and "Inability to connect with classmates for assignments in person" led to concerns about their ability to complete their work in online classes.

Research opportunities were also limited as a result of the move to online education. Among these changes were student's inability to meet with mentors and advisors (i.e., "I can't meet with my research advisor"), develop collaborations (i.e., "canceled conferences"), and access equipment (i.e., "unable to conduct research in labs," "no access to our lab's software, like ArcGIS, to complete work for assistantship deliverables"). Some students were unable to collect data for their research and had to change their research topics.

In addition to changes in resources that directly impacted students' ability to succeed in their education, other resources like "quiet space" and access to "library resources" were mentioned. For example, one student stated, "Prior to COVID-19 I used to study in the library, but now I am unable to do that."

Lastly, a change for some students was access to reliable internet, which was previously available on campus. For one student, the problem with the internet connection was related to their instructor: "Online lecture quality varies dramatically based on the quality of internet connection the instructor has." Other students had to spend more time working on assignments due to the slow speed of the internet: "Internet connection has been shaky so completing work takes longer." Some students had to drop classes because of internet-related issues: "Dropped out of 4/6 of my classes due to no internet & poor cell service. Postponing my graduation until I can take classes in person."

Negative reactions to changes in higher education

As a result of changes in instructional delivery mode and access to resources, more than half of responses (52%) reflected on negative affective or emotion-related outcomes that impacted students' ability to succeed. In many cases, when students discussed moving to online education, they expressed stress and concerns associated with such a move. Among these negative outcomes were feeling lethargic, procrastinating, and experiencing decreases in productivity, motivation, focus, and ability to learn. Students also expressed concerns about projects, grades, ability to manage the increased requirements of online education, and concerns about the future in general. One student explained,

> I feel generally less productive due to the fact that I no longer have access to study spaces such as the libraries. Being confined to one small space for working, eating, sleeping and general living creates subconscious distractions that make it difficult to focus.

Distraction and lack of appropriate space for education negatively impacted several students' productivity: "It has affected my productivity; […] It is more difficult to work from home because there are many more distractions." Lack of schedule and routine was also listed as an obstacle for productivity:

> I've been very unmotivated to do my schoolwork. The days seem to meld together a lot since all I really do now is schoolwork. I can't go to work (which luckily isn't detrimental to my current situation), I can't see friends, go work out, and my days lack variety, which I hate. Instead, I do schoolwork all day, which isn't something I necessarily enjoy, and can feel very repetitive and difficult during this pandemic.

Lack of motivation was accompanied by a lack of focus and productivity for many students. As students reported, "With classes being moved online I am definitely less motivated to get work accomplished and do not look forward to classes as I did," and "My productivity with school and work has been decreasing and I'm having trouble [to stay] focused."

Some students associated their lack of productivity with general apathy and highlighted worrisome emotions. As they shared, "Want to do activities but when it comes to doing them, I am too unmotivated to do them," and "Eventually leading to feeling like I just don't care to care anymore." For many students, such sentiments were atypical and out of character: "I am normally very busy and productive but now feel idle and useless" and "I feel lazier and unmotivated because I am confined to my room and it is hard to be productive this way." Students also reported feeling "more sluggish, lethargic, apathetic, purposeless and aimless, dazed and lost toward school, less active, less in mood to work." Moreover, students reported procrastinating more: "I find it harder to complete my work on time," and "I find myself procrastinating if I don't conform to a certain routine every day. Challenging part is I'm stuck in the house all day, so there is not much to do/look forward to once my work is complete." Some students were concerned that the pandemic made their school work irrelevant: "Wondering why should I stay productive and not working towards solving this issue." Interestingly, while many students felt less motivated and excited about their coursework, other students felt "less productive and falling behind deadlines even when fully putting in efforts." Students often could not explain their decrease in productivity

and reported, "A simultaneous feeling of productiveness and calm and feeling stressed and unproductive."

In addition to decreases in motivation and focus, students expressed concerns about their ability to learn in online settings, conduct group work, earn good grades, meet the increased requirements of online education, and be successful in the future. As multiple students reported, "I don't learn as well in online settings. I like an in-person teaching method better." Many students felt that they did not retain information the same way in an online setting as they did in an in-person setting. Many students reported that online education was never their top choice for a university experience: "Wasting money on this semester because I don't learn well with online classes, hence why I don't sign up for any, yet I am forced to do so this semester now."

As a result of these challenges, students reported feeling "less smart because online classes are harder to learn from." They worried about their grades, ability to complete required work, and management of multiple online demands and deadlines. As one student stated, "Dramatically change the structure of my classes, and I fear I won't be able to succeed." Another student stated, "There has been changes to grading in my classes that has caused me to believe that I might need to retake the class during the summer if possible."

Several students mentioned that the workload in their classes increased after moving online: "Instructors are assigning more work than they would during face to face classes." Even when the workload stayed the same, students had to "be more aware of assignment deadlines and due dates" and rely on their "self-accountability to watch online videos and get work done [because it] became ten times harder." As a result, students were "worried that this will impact my ability to graduate on time and get a good job."

Positive reactions to changes in higher education

While many students reflected on the difficult challenges related to changes in higher education during the pandemic, some students (11%) found these changes rewarding. For example, some students felt happier, less stressed, worried or rushed. Others reported thriving or feeling inspired. As one participant stated, "Spending more time on stuff that makes me happy to compensate for all the stuff that's going on." Similarly, another student stated feeling "Decreased expectations/anxiety for professional productivity."

Some students found that they appreciated having more personal time as a result of fewer everyday demands. One student described, "Stress from school is lower, since I get to stay at home. Don't have to worry about dressing, getting to school on time, etc." Similar ideas were shared by another student, "I get a lot of time for myself with the unnecessary travelling now avoided."

As a result of increases in personal time, some students reported leading healthier and happier lives. As one of them shared, "I have been able to cook more, play with my dog more, I have time for school work even while working from home. This makes me feel less stressed and happier." Several other students reported having time to focus on their health: "I have more time to focus on my mental and physical health. I have started yoga," and "I actually have time to work out and cook healthy now." Being able to spend time engaged in leisure activities were listed as positive outcomes of the pandemic: "Feel good about the extra free time to do things I enjoy like crafts and personal improvement projects," and "Have time to read novels and take walks." Some students reported feeling "more freedom

and in control, more flexible and self-dependent, more independent and autonomous." Students appreciated feeling "more reliant on my own organization and time management."

More personal time allowed students to have more balance in their lives as well. Students described "take life more slowly," having "more Me time," "my pace of life is more relaxed," and "Having to stay home though has made me realize I need to take more time to slow down." Students reported "appreciating slowing down and not having a fast paced life." One of the students claimed, "I feel that time has almost slowed down, giving me the mindset that there's nothing but time to complete things for the future." Other students reported that they were intentionally relaxing more during the pandemic, "I am changing my behavior by slowing down on the things I used to rush through." Some even lowered their technology use: "I am actually on my phone less (staying away from the news/media) and I have taken up some new hobbies." As a result, these students were able to engage in self-reflection and mindfulness: "I have more time for myself. So, it is helping in discovering myself." This finding highlights the differences in the way the pandemic affected different students. Moreover, it brings to the forefront the stress and anxiety commonly experienced and possibly not realized prior to pandemic by students in the contemporary educational system.

Discussion

This study explored students' perspectives on how the COVID-19 pandemic impacted their educational experiences. Data included over 1,500 quotes from an online survey administered to undergraduate and graduate students at seven U.S. universities between March and May 2020. The data clearly showed that students experienced many changes in their educational experiences, and these changes primarily increased the uncertainty and stress of living through the pandemic, although some positive reactions were noted.

The impacts on higher education from the pandemic included four categories. These comprised changes in the mode of delivery (switches from in-person to online education), changes in schedule and everyday activities (changes in activities, decreases in structure, changes in the concept of time, work-life balance), changes in technology use (increases in technology use, technology use for communication, technology use for entertainment), and changes in academic opportunities and resources (decreases in instructors' guidance, absence of peers, absence of tutoring, absence of research opportunities, absence of other academic resources). Similar changes have been discussed in previous research, including limited resources, lack of access to high-speed internet and reliable technology, cancelation of valuable educational experiences (i.e., class trips and service learning), disconnect from peers and the larger campus community, and the need for self-regulation in times of anxiety and uncertainty (Lederer et al., 2020; Stewart, 2020). The findings from our study add to the emerging understanding of the education-related changes experienced by students during the COVID-19 pandemic.

Student reactions to these changes in higher education were primarily negative but sometimes positive. Among the negative responses were decreases in productivity, motivation, focus, and perceived ability to learn. Students were concerned about their ability to successfully complete course projects, maintain their grades and academic performance, manage their demands and deadlines in the online learning environment, and the future in general. Students also reported feeling lethargic and procrastinating. The inability to focus, being less engaged in class work, and feeling apathetic has been observed in other

studies and is likely related to feelings of uncertainty and stress due to the pandemic (Aguilera-Hermida, 2020; Lederer et al., 2020; Neuwirth et al., 2020). Student's academic concerns have been largely tied to the move to online education during the pandemic in past research. As Adedoyin and Soykan (2020) discussed, "emergency remote teaching" did not allow a well-developed curriculum and adoption of effective strategies for online education delivery at most institutions (Bozkurt & Sharma, 2020; Hodges et al., 2020). We suggest that seeing the broad array of effects that the pandemic may have had on students' mental health and ability to perform is an important consideration when teaching and providing support (Woolston, 2020).

The current study also revealed that students used technology more, not only for school but also for communication and entertainment. This finding supports the results of previous research suggesting that the use of technology increased during the pandemic and included work related activities, consuming news/media, watching television, using social media to connect with others, shopping, and exercising, as well as using it for coping (Garfin, 2020; Nielsen Global Media, 2020; Molino et al., 2020). Interestingly, a study by Drouin et al. (2020) revealed that parents and children with higher levels of anxiety increased their use of technology, social media, and phones more during pandemic. The overwhelming use of technology can lead to multiple negative outcomes that Molino et al. (2020) labeled as "technostress." The participants of their study felt pressure to work faster and longer, viewed technology as more invasive in their private lives, and reported technological complexity making them feel inadequate and unprepared (Molino et al., 2020).

It is important to acknowledge that the data presented in the current study were collected during initial stages of the pandemic and may not reflect more recent student experiences. Although all students experienced significant changes in their education, their reactions to these changes may have been different. The initial stages of the pandemic were generally associated with panic, stress, anxiety, and depressive symptoms during the state of emergency (Wang et al., 2020). With the passing of time, longer-term effects of stress could have become more apparent. As previous research on the effects of traumatic events has revealed, various mental health disorders may become lasting issues, including post-traumatic stress disorder (PTSD), major depressive disorder (MDD), substance use, anxiety disorders, panic disorder, phobias, and prolonged grief associated with the loss of loved ones (Iqbal et al., 2020). These effects depend on multiple factors, including students' gender identity and sexual orientation, coping strategies, social support, and stage of education (freshmen vs. graduate students) (Copeland et al., 2021; Lederer et al., 2020; Woolston, 2020; Ye et al., 2020). Still, students may have some protection from these impacts through their families, better physical health, and resources at their university. For example, a study by Charles et al. (2021) revealed that by Fall 2020, students had returned to their pre-pandemic levels of mood disorder symptoms, perceived stress, and alcohol use.

Despite the overwhelmingly negative outcomes of the move to online education, some students in this study reported increased happiness, reflectivity and adaptability, time and freedom, slow living, creativity, productivity and focus. Previous research has also revealed that students appreciated decreases in commuting and gas expenses, ability to spend more time with family, flexibility with deadlines, and having more time to rest or complete assignments (Armstrong-Mensah et al., 2020). Similarly, a study by Gonzalez et al. (2020) posited that some students' academic performance improved during the pandemic as a result of changes in learning strategies and formation of new habits. It is important to explore what makes such groups of students experience the dramatic changes in their education during the pandemic in a more positive way than other students. This could be related to personalities, demographic characteristics, or mental perspectives on life, such

a growth mindset. Understanding why some students responded positively to the changes during the pandemic may have implications for students' busy and hectic lives during non-pandemic times. Breunig (2020) discussed nature-based "slow" leisure as a way for students to feel happier and more free, reflexive, and creative. Although the pandemic had negative effects on students and higher education in many ways, it is encouraging to see that some lessons learned might bring about positive change.

Limitations

There were several limitations to this study. First, although this study was based on a large volume of qualitative data, we used an online questionnaire, which limited our opportunity for deep exploration through follow-up questions. Second, we collected data at seven universities across the U.S. These universities may have introduced different policies related to quarantine, lockdowns, and online education during the early stages of the pandemic, resulting in varying student experiences. Third, there were slight differences in the data collection timelines among the seven universities, which might have impacted students' responses. Fourth, since our sample was primarily represented by non-Hispanic White students, the results may not reflect the experiences of students of color or international students who might have been more impacted by the pandemic due to marginalized positions before the pandemic. Students' experiences are also likely to have been influenced by unaccounted for mediating factors, such as their support system, coping strategies, family situation, and stage of education. Last, we were unable to capture student responses in subsequent semesters during the pandemic, and student's perceptions and experience might have changed as the pandemic progressed.

Recommendations for research and practice

Based on the results of this study, we suggest future research explore how different groups of students experience and respond to change during transitions from in-person to online education during the pandemic. We also recommend future research on the consequences of these changes on students' long-term educational and emotional outcomes. We suggest employing a mixed method approach to explore these questions in depth and ensure the nuances of this experience are thoroughly understood and recorded. Comparative studies exploring the experiences of students in different geographical locations (rural/urban, by state) and across the world should be conducted to reduce disparities in understanding the impacts of the pandemic on higher education in other contexts (Bao, 2020; Doyumgaç et al., 2021; Paudel, 2021). We suggest this research focus on specific groups of students representing the diversity of the student body in the U.S. and beyond. Longitudinal studies should be conducted to explore the lasting effects of providing more online education during and after the pandemic.

We also recommend guidance for faculty members and higher education administrators working with students. As suggested by Lederer et al. (2020), the pandemic exacerbated inequalities among students. Higher education institutions should further attempt to mitigate these disparities by ensuring data-driven and equity-informed decision making, clear and informative communication with students, and accessible support services (Lederer et al., 2020). The move to online education during the pandemic may be more complex than simply employing strategies used for online education prior to the pandemic.

The design of online education is fundamentally different and a completely new approach to online education may be needed. As Hodges et al. (2020) and Bozkurt and Sharma (2020) highlighted, there is a large need for the development of best practices in effective online education, including quality course design, effective teaching strategies, and use of research, theories, and ethics within the virtual/hybrid classroom. Effective online education should start with the planning and development of online-specific curriculum and development of additional resources for faculty and students rather than the translation of traditional educational materials into an online format (Hodges et al., 2020).

In addition to new approaches to curriculum development, new strategies to support students and faculty are needed. Since students did not experience the transition to online education as a homogeneous group, personal approaches to delivering the content may be necessary. Faculty members should be provided with additional time and resources to ensure they can offer such personalized attention. Additional support services, such as tutoring, study groups, and help with developing new routines, should be offered for extended time periods on a variety of communication platforms. These services should be available to students at times that are convenient to them to facilitate their ability to receive extra assistance and provide private and quiet places to discuss their concerns while still accounting for differences in internet access. Consideration of differences in technology access should be addressed to avoid marginalizing students from families in distress or those in rural and low-income communities. Additional resources and training are needed to help faculty adapt and effectively respond to the online education experience (Moralista & Oducado, 2020; Watermeyer et al., 2021).

Many students experienced negative outcomes and reactions to the changes in education as a result of the pandemic. These changes impaired many students' ability to learn and process course material, as well as demonstrate their knowledge comprehension/retention during evaluations. Policies and procedures should be developed to facilitate students' ability to take fewer courses, drop courses at a later date, and receive additional resources prior to exams. We found many students struggled with online education, especially in cases when they felt disconnected from their instructors or relied too much on their own organizational skills. Faculty members should make their best effort to provide engaging online synchronous lectures and focus on alternative strategies for learning evaluation. Presenting class material in a systematic and easy to follow way through university learning systems that reminds students of upcoming deadlines may reduce unnecessary stress and confusion. We also found that students experienced a variety of negative emotional outcomes because of the move to online education and other changes associated with the pandemic. To address these negative outcomes, trauma-informed teaching strategies could be used, ensuring that faculty-student communication provides meaningful connections and a sense of community, encourages resilience and healthy coping strategies, and shows that the instructor is available and willing to help students process and manage the traumatic emotions.

Since a small share of student respondents discussed positive reactions to the transition from in-person to online education, colleges and universities should help students connect with each other in the virtual classroom to allow for social support, resiliency, and a positive educational experience. This experience could create an opportunity for students and society at large to reconsider the value and importance of meaningful and happy life experiences, as well as generate ideas for potential changes in the way that higher education is structured. More in-depth qualitative exploration of students' experiences and changes in higher education is needed to understand what specific pandemic-related changes students would like to abandon and which innovations students would want to retain to help reshape the future of higher education in the post-pandemic era.

Declarations

Conflict of interest There is no conflict of interest to report.

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