Teaching and Learning in Communication Sciences & Disorders

Volume 7 | Issue 1 Article 1

2023

Impact of the COVID-19 Pandemic on Undergraduate Students Studying Anatomy and Physiology of Speech and Hearing: A Pilot Investigation

Katelyn J. Kotlarek
University of Wyoming, kkotlare@uwyo.edu

Kerry Callahan Mandulak
Pacific University, mandulak@pacificu.edu

DOI: 10.30707/TLCSD7.1.1675490380.903853

Impact of the COVID-19 Pandemic on Undergraduate Students Studying Anatomy and Physiology of Speech and Hearing: A Pilot Investigation

Abstract

The purpose of this pilot study was to define what changes were experienced in the Fall 2020 semester by students in an undergraduate anatomy and physiology of speech and hearing course and highlight any differences in the experience of first-generation college students (FGCS). An online survey was administered to a single class of undergraduate students. Results indicated that students experienced a variety of challenges related to the pandemic and virtual learning. Differences in the experiences of FGCS compared to traditional students included increased hours worked and feelings of being overwhelmed and spending less time on course content each week. Future research is warranted to investigate these trends within a more representative population and identify ways that academic support can be utilized to improve student success.

Keywords

covid-19, communication science and disorders, anatomy, undergraduate, first generation scholars

Cover Page Footnote

Acknowledgements: We would like to thank Richelle Dietz for her assistance in data collection and analysis. We would also like to thank Erin Bush, PhD, CCC-SLP for her feedback and expert guidance on the methodology employed in this work.

In March 2020, the virus known as severe acute respiratory syndrome coronavirus 2 (Sars-CoV-2) that caused coronavirus disease 2019 (COVID-19) began to spread across the United States. The pandemic triggered a National Emergency resulting in nearly all universities and colleges transitioning to online learning (National Conference of State Legislatures, 2020). COVID-19 regulations made significant changes to the delivery of course material for the academic year 2020-2021, and guidelines for on campus activities changed significantly. Faculty and students had to adapt quickly to virtual learning amidst changes to employment and health (Dhawan, 2020). COVID-19 impacted many individuals in their everyday life, including effects on work and academic performance (Pew Research Center, 2020). Due to the global pandemic, it is reasonable to assume that students' engagement in classes had also been affected in many ways. The COVID-19 pandemic has also highlighted existing disparities within our society.

The adjustments that undergraduate students have had to make with respect to their learning environment, place of residence, study habits, and availability for deep engagement with their learning likely had differential effects that intersect with students' identities and lived experiences. Morris and colleagues (2021) found that the experiences of college students during the COVID-19 pandemic were variable but discovered that both academic and social-emotional variables contributed to the heterogeneity in student experiences, addressing family needs, reduced interaction with peers, and lack of interaction with professors all contributed to students' responses to the virtual learning shift. Students who were able to implement methods to abate the effects of isolation and decreased engagement reported feeling more able to cope with these stressors but still experienced higher levels of stress in general (Morris et al., 2021).

Historically Underserved / "Non-Traditional" Students

Students who have been identified as "non-traditional" or historically underserved or excluded are characterized by some aspect of their background that doesn't align with white, middle class/upper middle-class men that had traditionally made up a large proportion of students in higher education settings (Sedlacek, 1993). The definition of "non-traditional" could therefore vary widely. More commonly, historically underserved students are identified as minority from a racial and ethnic perspective, low-income students, or students who are first generation college students (see Green, 2006, for a summary). What we know from the research on historically underserved students is that they experience hardships navigating the higher education learning space, both from the transition into higher education and then also within college, leaving them at risk for "leaking" out of the educational "pipeline" as they move through it (Green, 2006). With a decrease in peer support and significantly less opportunities to interact with professors for assistance, the danger of losing these students would likely increase with the shift to fully remote learning.

First-Generation College Students. One subset of historically underserved students that has not received much attention in the communication sciences and disorders (CSD) literature are students who identify as first-generation college students. *First-generation college students* (FGCS) are operationally defined as college students whose two parents did not attain a bachelor's degree (Ishitani, 2006), compared to students who have at least one parent with a four-year degree (*continuing-generation students)* (Stephens et al., 2014). In some studies, FGCS are divided and described as students whose parents received only high school education versus those whose parents completed some college education (Ishitani, 2006). While the number of FGCS entering

post-secondary education has been well-documented (RTI International, 2019), it was estimated in 2015-2016 that 56% of undergraduates in the United States were FGCS, and 59% of these students were also the first member of their family to attend a higher education institution (RTI International, 2019).

The original large body of foundational research about FGCS comes from a longitudinal study of college students called the *National Study of Student Learning* (NSSL) that was funded by the United States Department of Education's Office of Education Research and Improvement (OERI) (see Terenzini et al., 1996, for a summary). This seminal research focused on three general areas: the process of planning to go to college and expectations about college, the high school to college transition, and investigations of the comparison of retention and persistence through their time in college with "traditional" or better defined as continuing-generation students (Pascarella et al, 2004; Terenzini et al., 1996). The overall conclusion from these large-scale studies has been that FGCS are set apart from their peers with respect to challenges with transitioning to college and knowledge about higher education, spending their time at college (academic and social activities), and reduced persistence to the completion of their degree. Specifically, FGCS are more likely to have lower family income, come from minoritized backgrounds, and spend less time socializing with peers and talking with teachers while in high school (Terenzini et al., 1996). Once in college, FGCS were found to complete fewer total hours during their first academic year, spend fewer hours per week studying, and work more hours per week off-campus (Pascarella et al, 2004; Terenzini et al, 1996). In addition, these students were less likely to live on campus and more likely to be enrolled part time, which may lead to less extracurricular interaction with peers and fewer developmental benefits of college (Pascarella et al, 2004).

With respect to the experiences of FGCS within the field of CSD specifically, the evidence of their academic achievement, differential experience of higher education, or retention and persistence in college is limited. Specifically, the research that has been completed regarding FGCS in CSD have been mostly focused on effects of graduate admissions or graduate studies. For example, a study by Fuse and Bergen (2018) acknowledged the complexity of recruiting and retaining minoritized students (on multiple dimensions) in their study of the impact of specific types of support systems for students from culturally and linguistically diverse backgrounds. The researchers investigated the effect of role models, financial support, and systems of support in both academic and social realms, and how these support systems impact academic outcomes and graduate admission acceptances. Students who identified as FGCS (either their mother or father's highest level of education being "some college" or less) were more likely to be students from culturally and linguistically diverse backgrounds (Fuse & Bergen, 2018). Friends, teachers, or siblings were more likely to be identified as role models for the students who were from a culturally and linguistically diverse background compared to parents, friends, or teachers for the non-culturally and linguistically diverse students. The vast majority of alumni who identified as FGCS that participated in this study (98%) stated that they received familial support to attend graduate school, which may have consisted of financial, emotional/moral, and/or academic support (Fuse & Bergen, 2018).

In addition, evidence exists that CSD students who identify as environmentally or economically disadvantaged (lower social economic status) or FGCS are denied admission to graduate school at a higher proportion than students who are admitted (Council on Academic Programs in

Communication Sciences and Disorders [CAPCSD], 2019). For example, students who identify as FGCS in the 2019-2020 CSDCAS application cycle made up only 15.97% of the accepted pool of students compared to 22.49% of the denied pool of students (CAPCSD, 2019). A recently published study by Kovacs (2022) examined barriers to graduate school admission for applicants who were categorized as being underrepresented in the field of CSD (first generation college students, low SES students, and BIPOC students). The results of the study found that underrepresented students were more likely to submit an incomplete or late application for graduate school compared to overrepresented students (Kovacs, 2022). In addition, students from underrepresented populations received similar scores on letters of recommendation and on personal statements, compared to overrepresented students; there were statistically significant differences, however, between the groups on GPA and GRE scores, with underrepresented students having lower overall mean GPA and GRE scores compared to overrepresented students. From the limited literature focused on FGCS and students in the CSD field, it appears that academic differences that are measured by GPA and standardized test scores may intersect with the identities and lived experiences of these students.

Anatomy & Physiology of Speech and Hearing Course

The Anatomy & Physiology of Speech and Hearing course (now referred to as A&P) is commonly included as one of several standard requirements in the realm of pre-requisite courses for graduate study in CSD. Sylvan and colleagues (2020) found that 80% of graduate programs required the same six courses, and 94% of programs required A&P specifically. Other studies have found similar results (Lubinsky, 2004; Tessel & Grover, 2020). In addition, Tessel and Grover (2020) discovered over 80% agreement regarding the priority of topics taught in A&P in a faculty survey, noting that this course may be one of several that is taught consistently across universities. Lemoncello (2015) suggested that A&P is an essential building block for many graduate courses in speech-language pathology master's degree programs, and one could argue the same for audiology clinical doctorate programs as well. Whereas current evidence of the prevalence of this course in undergraduate programs exists, the acknowledgement of where this specific class occurs in the progression of curriculum within a program or the importance of this course in the evaluation of academic performance has not yet been studied.

Purpose Statement

Both authors are employed at universities that have a relatively high percentage of FGCS (30 – 40% and 25%, respectively). This study was conceived as one effort to examine inclusive teaching methods through the American Speech Language Hearing Association's Advancing Academic-Research Career Award program, awarded to the first author, with the second author serving as the teaching mentor. The study was conducted in this specific limited time and location context in order to examine the intersection of the first author's appointment at a university with 30-40% of the student body identifying as first generation; the A&P class representing a standard requirement for CSD graduate programs; and the circumstances surrounding the COVID-19 pandemic.

The purpose of this pilot study was to (1) define what changes were experienced in the Fall 2020 semester by students in an undergraduate A&P course in CSD and (2) highlight any differences in

the experience of FGCS compared to "traditional" or continuing-generation students. We hypothesized that all students experienced impacts to their course of study due to the COVID-19 pandemic, and of those students, FGCS would report differential experiences from those that did not identify as first generation. Because GPA has been found to be the most significant predictor of graduate admissions offers in CSD programs (Theodore et al., 2019), we hypothesized that negative experiences with CSD coursework may inhibit continued engagement in the major and/or later success with seeking graduate school acceptances, therefore perpetuating the historical exclusion of these students from the CSD field.

Methods

Survey Development. Because an appropriate survey instrument did not already exist, a 50-question survey (Appendix A) was developed by the authors to investigate the impact of COVID-19 on undergraduate students studying A&P at a single, Carnegie R2 institution of 11,829 enrolled undergraduate students in 2020 (National Center for Education Statistics, 2020). A&P was chosen because this course is a required prerequisite course for admission to 94% of graduate programs in CSD and is an essential building block to other major coursework (Lemoncello, 2015; Sylvan et al., 2020). The survey included four sections that targeted demographic information, experience with virtual learning, perceived impact of the pandemic on students' current situation, and perceived comparison of this semester to previous semesters. The electronic survey was created and distributed using Qualtrics (Version 10.21). A mixed methodology expert in the field with eight years of experience teaching undergraduate students in CSD (including A&P) reviewed the survey questions to establish face validity and review questionnaire construction.

Procedure. The Institutional Review Board approved this research, and an Institutional Affiliation Agreement was in place. The survey was administered in the second half of the fall semester of 2020. A link to the electronic survey was shared via Canvas with students in the A&P course. This particular institution was selected due to the relatively high percentage of FGCS (30-40%; University of Wyoming, 2020). This institution offers a Bachelor of Science in Speech, Language, and Hearing Sciences and a Master of Science in Speech-Language Pathology in addition to a Certificate in American Sign Language Studies. It is considered a primarily white institution (74.6% White, 5.58% Hispanic/Latinx, 3.9% Two or More Races, 1.21% Asian, 1.12% Black/African American, 0.761% American Indian/Alaskan Native, and 0.11% Native Hawaiian or Other Pacific Islander; National Center for Education Statistics, 2020). The city in which this institution is located has a population of 31,407 people and is also primarily white (87.3% White, 1.4% Black/African American, 0.9% American Indian/Alaskan Native, 3.8% Asian, 0.1% Native Hawaiian/Other Pacific Islander, 4.5% Two or More Faces, 10.8% Hispanic/Latinx; United States Census Bureau, 2020). Only a single class was surveyed due to the pilot nature and timeliness of this work.

The survey was open for three weeks, and students received a reminder announcement each week containing a link to the survey. The electronic survey contained a consent agreement and explained the purpose of the study. By agreeing to participate, each student verified that they were 18 years of age or older and gave their informed consent to participate in the study. Students were informed that their choice to not participate in the survey would not have a negative impact on their grade in the course.

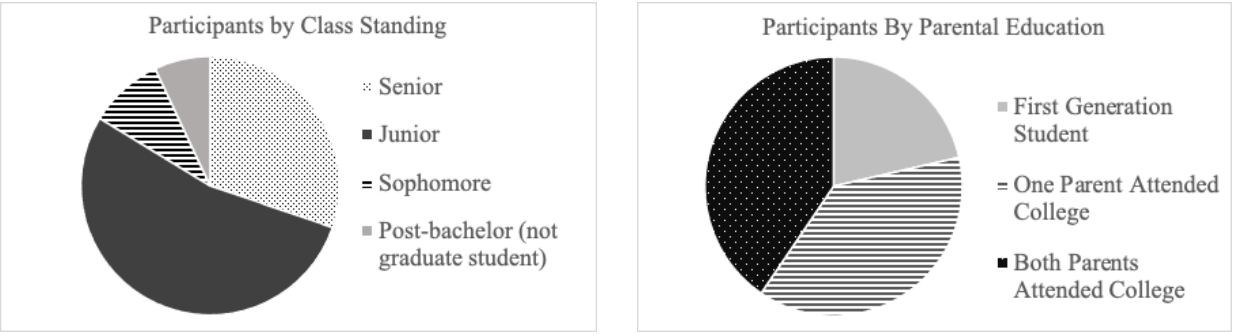
Data Analysis. Internal validity was established between questions loading onto the same factor. Descriptive statistics were obtained through Qualtrics (2021). Due to the descriptive nature of survey research, causation was not examined. Data from the closed set responses in the survey were quantitatively analyzed to describe differences between groups and relationships between the variables analyzed (Orlikoff et al., 2015). Open-ended responses were analyzed using qualitative content analysis to highlight themes across responses by measuring the frequency of different categories (Vaismoradi et al., 2013).

Results

The survey was available to a single class of 45 undergraduate students, 43 of whom consented to the research and subsequently completed the survey for a response rate of 95.56%. One of the participants failed to complete the entire survey, but the responses provided were included. 86.05% (n = 37) of students were currently majoring in speech, language, and hearing sciences at the time of this survey, and all but four students indicated that A&P was required for their major. Of the respondents, 30.23% (n = 13) were seniors, 53.49% (n = 23) were juniors, 9.30% (n = 4) were sophomores, and 6.98% (n = 3) were post-baccalaureate students (not graduate students). No freshmen or graduate students were enrolled in this course (Figure 1). Despite the overwhelming majority of upperclassmen, 13.95% (n = 6) indicated this was their first year and 23.26% (n = 10) were in their second year at this university, indicating a substantial presence of transfer students (27.91%). Four students (9.52%) considered themselves nontraditional students, and one student had at least one child. Of the respondents, 21.43% (n = 9) identified as FGCS, 9.52% (n = 4) identified as non-traditional students, and 27.91% (n = 12) transferred from another institution. The vast majority intend on applying to graduate school for speech-language pathology (74.42%) in the future. Of those students that were unsure about graduate school, the most common factor was finances (66.67%). The mean grade point average (self-reported) of students in this course was 3.44 (SD = .45).

Figure 1

Demographics of participants by class standing and parent education level



Quantitative Findings

Learning During COVID-19. During the Fall 2020 semester, 97.62% of students reported taking their classes completely online with 88.10% having a preference for face-to-face delivery. Despite

classes being mostly online, 80.95% of students reported currently living in the same city as the university. The vast majority of students felt that both the university (83.33%) and their instructors (100%) were helpful in their transition to online courses to some degree. All students reported having the appropriate technology to be successful in their online courses. While all students reported some degree of distraction while watching online recorded lectures, the level of self-reported distraction varied between 'sometimes' (35.71%), 'about half the time' (21.43%), 'most of the time' (28.57%) and 'always' (14.29%). The vast majority of students in this class (59.52%) reported their online classes were more difficult than in-person classes, but some (23.81%) indicated the level of difficulty depends on the class and/or instructor. The average reported time spent on this particular class was 8.02 (*SD* = 4.45) hours per week, and most students reported spending either the same amount of time (32.56%) or more time (53.49%) on this course compared to others during this semester. Regarding difficulty, the majority of students felt that this course was more difficult (32.56%) or the most difficult (37.21%) compared to their other current courses. The majority of students (76.75%) regularly felt overwhelmed by their academic work, ranging from consistent monthly (16.28%) to daily (32.56%) occurrences throughout the semester. 86.05% of students felt that COVID-19, in general, had at least a little negative impact on their performance in A&P during Fall 2020. Although 44.19% of students indicated no positive impact on their performance due to COVID-19, 55.81% of students indicated at least a little positive impact. When asked to self-report their current grade in the course, students indicated the following: A (16.67%), B (35.71%), C (40.48%), D (7.14%), F (0%). When asked to predict their grade by the end of the course, these percentages improved drastically: A (38.10%), B (42.86%), C (19.05%), D (0%), F (0%).

Students were also asked to compare aspects of the Fall 2020 semester to their experience during previous semesters. 50% of students reported both spending more time on this course and performing worse in Fall 2020 compared to courses in previous semesters despite the majority of students (59.25%) enrolling in the same number of credits. Regarding difficulty, the majority of students felt that this course was more difficult (40.48%) or of similar difficulty (38.10%) compared to coursework in previous semesters. In general, the majority of students reported less distraction during previous face-to-face courses than online courses in Fall 2020: Never (16.67%), Occasionally (57.14%), Sometimes (19.05%), Frequently (7.14%), Always (0%). Students contacted their instructor less during the Fall 2020 semester, with only 79.07% of students communicating one-on-one with their instructor at least once compared to 97.62% during previous semesters. Likelihood of contacting teaching assistants showed a similar trend but was less frequent, with only 46.51% of students communicating one-on-one with their teaching assistant at least once compared to 85.71% during previous semesters. Peer-to-peer social interactions also decreased drastically as well. 86.05% of students interacted with peers less for study purposes, and 79.07% of students communicated with their peers less frequently overall.

Student Employment During COVID-19. Employment status has changed for many people in the light of the COVID-19 pandemic. 34.88% of students worked to support themselves, which was similar to previous semesters (38.10%). 10.13% of students in this class were considered essential workers, and 20.25% indicated their family members were essential workers. A greater percentage of students reported working more hours (38.10%) than fewer hours (30.95%) due to COVID-19, and thus, the average hours worked by students increased by approximately 4 hours during Fall 2020 (Mean = 16.51 hours, *SD* = 13.09 hours) compared to previous semesters (Mean

= 12.40 hours, *SD* = 10.77 hours). Almost a quarter of students in this course (22.78%) indicated the employment status of someone in their family was negatively impacted by COVID-19. A few students indicated that their family's employment status (7.59%) and/or their own employment status (10.13%) had not been impacted.

Differences in Educational Experience of First-Generation Students. For the nine students that identified as FGCS, the average number of hours worked was 20.56 hours per week (*SD* = 15.69 hours) during the Fall 2020 semester compared to the student average of 16.51 hours per week (*SD* = 13.09 hours; see Figure 2). 77.78% of FGCS worked to support either their families or themselves compared to 55.81% of the entire class. The average reported time spent on this class was 6.25 hours per week (*SD* = 3.53 hours), which was less than the class average (Mean = 8.02 hours per week, *SD* = 4.45 hours). Despite these differences, FGCS (Mean = 3.50, *SD* = 0.40) reported a similar overall grade point average to the class average (Mean = 3.44, *SD* = 0.45). 88.90% of FGCS regularly felt overwhelmed by their academic work in Fall 2020 compared to 76.75% of the entire class, and a greater percentage of FGCS (44.44%) felt overwhelmed on a daily basis compared to the class as a whole (32.56%).

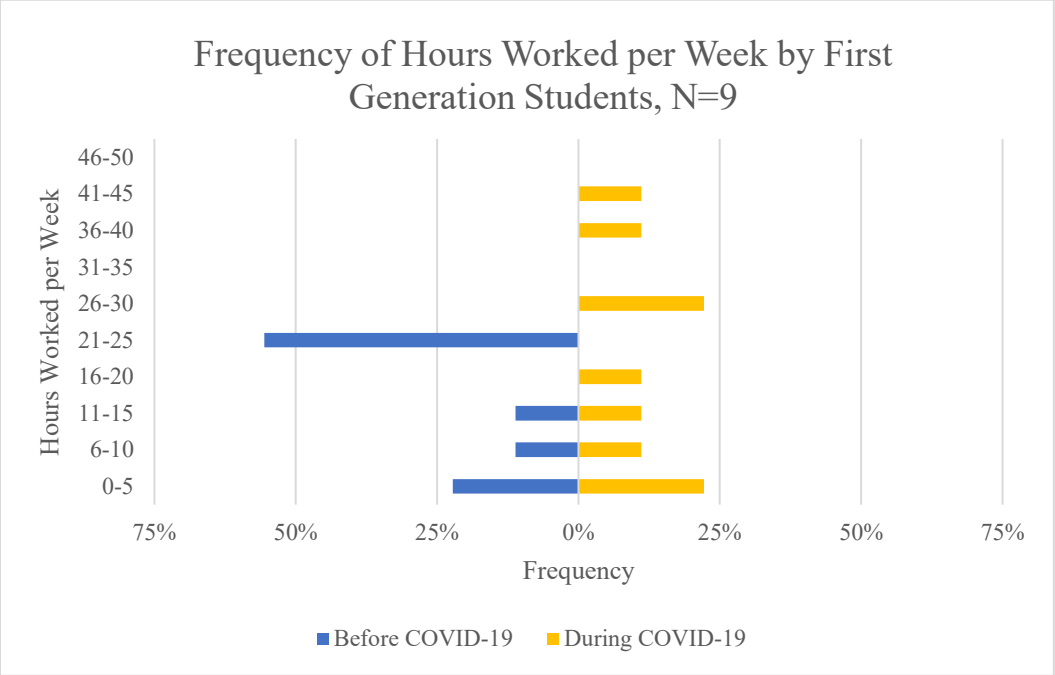
Qualitative Findings

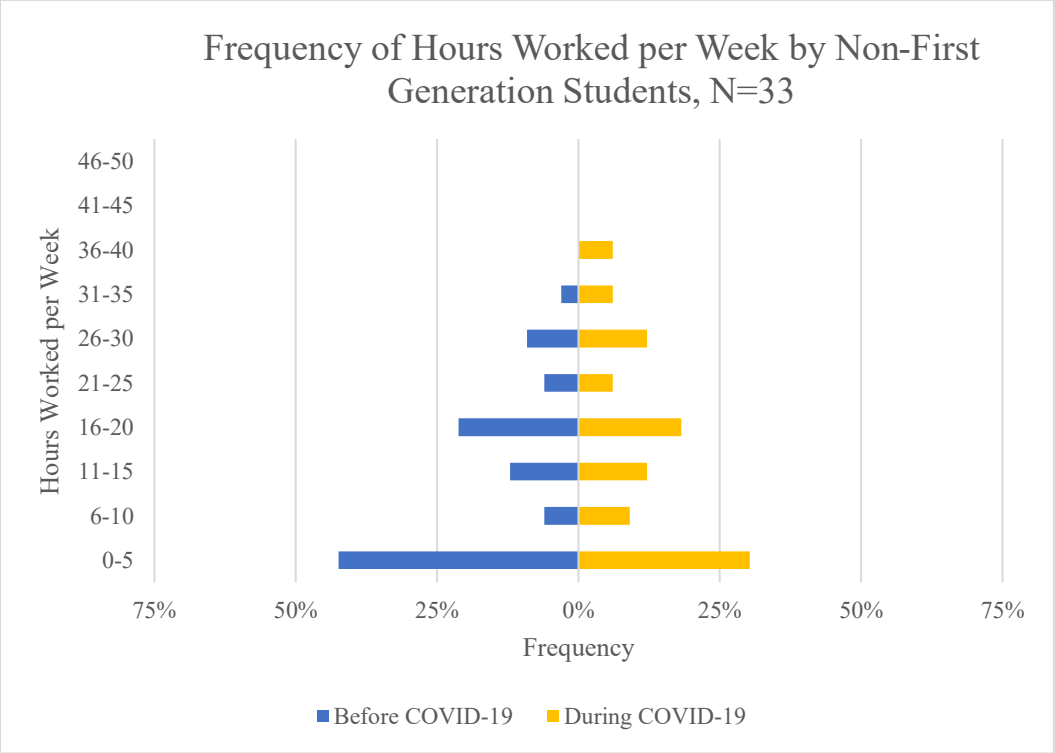
The first author consulted with a qualitative methodologist to undertake the content analysis. Both the first author and the qualitative methodologist analyzed the data. There was a total of 32 responses to the open-ended question. We analyzed 14 responses, specifically any responses that was longer than one word. 16 responses were single words, 12 of which were "none," "no," or "nope" and 4 were "N/A."

Content included discontent with the university's approach, lack of engagement, general difficulty of courses, positives about this course, and mental health and anxiety for future. Three students were very unhappy with the university and exhibited genuine discontentment with the university's approach to online learning during the COVID-19 pandemic. One student indicated a substantial financial burden was placed on them due to inability to get loans that fully covered tuition. Five were specifically positive about this course in comparing the response to COVID to the university in general, either because the workload is appropriate, they've been asked and feel heard, or technical aspects of course delivery. Students report positive comments on wi-fi connectivity and content delivery in this specific course. Students also reported that simply being asked about how they felt in this class was a positive aspect that was not echoed by the university or other courses they were enrolled in. Three students alluded to a lack of engagement, both between students as well as between faculty and students. One suggested that faculty should require study groups to facilitate more engagement in class. Another student approached engagement from a sympathetic standpoint, indicating that they felt faculty could not see their facial expressions. The most popular idea (6 entries) talked about the general difficulty of courses during COVID-19 pandemic. Two specifically talked about a lack of access to resources (e.g., study spaces). Two mentioned their mental health, indicating poorer. Although several implied mental health impacts, two students specifically spoke about mental health being impacted negatively by this semester. Interestingly, both people that explicitly mentioned negative mental health impacts also expressed worry in preparation for their future academic work and continuing with online coursework. There were no content areas specific to only those participants that identified as FGCS.

Figure 2

Comparison of hours worked by participants before and during COVID-19 pandemic in FGCS cohort compared to other students in the class





Discussion

The COVID-19 pandemic has given us a window into the differential effects of trauma-informed experiences on the performance of students studying CSD. The lessons we have gleaned during the time, relative to both virtual teaching and learning and the impact on FGCS, provide a welcome insight into the present and future lives of our students.

Experiences with Virtual Teaching and Learning. Prior to the pandemic, the undergraduate CSD program at this institution offered its coursework solely on campus (face-to-face) with no options to take within-major coursework online. In addition, the majority of coursework at this institution was also offered only in-person prior to the COVID-19 pandemic. Therefore, it is very likely that most students in this undergraduate course were accustomed to in-person classes and had limited-to-no experience with online learning prior to this time. Adapting to a new learning environment can result in an increased workload for both instructors and students alike. A student candidly noted, "Overall, I feel like I have more work watching pre-recorded lectures but being able to reference those later while I am studying has helped a lot…." Learning any new skill, including virtual learning, takes time and practice: something that students and instructors alike did not have when switching to online teaching in March 2020. Virtual learning may not be as efficient for those students who previously learned via face-to-face courses and are still acquiring this skill. Additionally, recorded lecture material may be viewed as *additional* homework that was previously not considered part of the workload when delivered during a face-to-face class. As noted in the student's quote above, recorded lectures can be viewed through both a positive and negative lens including being a beneficial tool for review (positive) but time intensive (negative). Lecture recordings may be an asset for studying skills moving forward as courses have resumed in-person delivery.

In addition to academic variables, Morris and colleagues (2021) found social-emotional variables contributed to student experiences during the pandemic; addressing family needs, reduced interaction with peers, and lack of interaction with professors all contributed to students' responses to the virtual learning shift. Only 79.07% of students communicated one-on-one with their instructor (compared to 97.62% previously), and 46.51% communicated with teaching assistants (85.71% previously). 86.05% of students also interacted with peers less for study purposes. Some students related the academic difficulty of their coursework with limited face-to-face interaction. For example, one student stated, "... without the face-to-face interaction and clarification when in person, I find it a lot harder to get through the content..."In a similar vein, another student reflected, "... not being able to meet with peers to study makes [studying] even harder... I have tried to participate in study groups [on Zoom]... however [classmates] forget to Zoom me into meetings to participate in the study sessions." Socialization is an integral part of the college learning experience, whether it be with classmates or instructors. Many students utilize study groups to succeed academically, and with an abrupt shift to virtual learning, many students and instructors were not adept at the technology and planning required to facilitate online study groups. Asking questions of the instructor during or after class could be viewed as less intimidating than seeking out a one-on-one virtual meeting to ask for help. Limited socialization during the pandemic may be an unforeseen academic consequence as well as a social-emotional variable.

Impact of COVID-19 on First-Generation Students. The present study mirrored the disproportionate impact of the COVID-19 pandemic on minority student populations, in this case FGCS. Employment played a larger role in the lives of FCGS before and during the COVID-19 pandemic. Pre-pandemic, Pascarella and colleagues (2004) noted that students who identified as first generation worked more hours per week. In Fall 2020, 77.78% of FGCS in this class worked to support either their families or themselves, and this group worked an average of 20.56 hours per week, with some working over 40 hours per week. In this study, 88.90% of FGCS regularly felt overwhelmed by their academic work in Fall 2020 compared to previous face-to-face lectures. One FGCS in this class mentioned, "I am taking a normal credit load this semester, but all of my classes are assigning way more work for me to complete, and I think that it's too much sometimes." Increased demands on students' time may have had an impact on perceived difficulty of coursework during this time. While it *may* be possible that instructors increased the workload while transitioning courses online, it is more likely that a variety of factors played into the student perception of an increased workload. As we previously noted, learning a new skill (e.g., online education) takes time to develop efficiency. The pandemic and quarantining resulted in many students studying from home, which may have resulted in increased distractions. Lastly, recorded lecture material may be viewed as *additional* homework rather than a replacement of face-to-face class. Regardless of cause, the perception of increased workload may have also resulted in greater stress and decreased academic performance during this time. Another FGCS reflected, "I seem to really struggle taking online courses in this level of difficulty. I am unable to study somewhere I can focus like I have at my community college on campus." FGCS are likely to have lower family income and more likely to come from minoritized backgrounds (Terenzini et al., 1996). This may result in an increased reliance on community resources for success, such as technology and quiet study space. FGCS are also less likely to live on campus during college (Pascarella et al, 2004), making access to quiet study spaces within their home very difficult if not impossible during quarantine. These are just some of the ways the experiences of FGCS differ from their peers during the COVID-19 pandemic.

Looking Beyond COVID-19: What Have We Learned? It is clear that post-pandemic life, although beginning to show a glimpse of normalcy, does not revert back to "how things were" before the pandemic. We need to reflect on what we have learned about teaching, about students, and about ourselves. Since the majority of students who are in this course were speech-language pathology and audiology majors, and anticipated attending graduate school, performance in this course may have effects endured beyond this semester. In the words of one student, "... I've never felt less prepared or less educated in a semester of school. I'm extremely worried about the toll this will take on my future classes...." This quote highlights student self-awareness regarding their education and the long-term impact of the COVID-19 pandemic on their future. Theodore and colleagues (2019) found that GPA was by far the most significant predictor of graduate admissions offers. For many students, especially FGCS, it is likely that GPA decreased during this time. As many of these students were likely to pursue graduate school, we cannot forget the challenges they endured during their education and the unprecedented level of resilience this pandemic required in order to continue their planned courses.

Similar to our students, we cannot forget the valuable information the COVID-19 pandemic taught us with respect to disparities within the classroom and accessibility. The disparity between the racial and ethnic composition of the CSD workforce and United States population is well-

documented (American Speech-Language-Hearing Association [ASHA], 2021; United States Census Bureau, 2011). This lack of diversity, which can be expanded to include gender identification and first-generation students, and underrepresentation of diverse CSD professionals likely begins much sooner than undergraduate CSD programs. Fuse and Bergen (2018) found that CLD students were more likely to have teachers as role models and support figures. Further, academic (e.g., GPA) and admissions outcomes were better for those students who received emotional support compared to those who received less emotional/moral support. This demonstrates that we need to be more hospitable and accommodating to the learning needs of all students, including FGCS, and promote equity over equality. Using inclusive teaching and admissions practices, such as Universal Design for Learning (UDL) (Center for Applied Special Technology [CAST], 2018), Transparent Instruction in Learning and Teaching (TILT) (Winkelmes, 2014), and holistic review processes for graduate admissions (Mandulak, 2021), would likely benefit all students and may specifically uplift FGCS to succeed. Discipline-specific mentoring strategies may also be helpful with this population to facilitate connection and a sense of belonging, such as a mentoring relationship between undergraduate and graduate students.

Limitations and Future Directions. This study is most limited by the small population and representation from a single institution. Due to the novelty of this topic and the timely nature of this study, the authors felt publishing the findings at this stage of the research was essential. Additionally, demographic data regarding race, sex, and ethnicity was not collected as part of this survey, and thus, we did not explore the intersectionality among other possible contributing variables (nor would we have the statistical power to show those differences). Caution should be practiced in extrapolating these results to the broader population of CSD students due to the single class of students sampled, the lack of demographic variables, and the comparison to students' reflection on their past coursework. Future research should implement this survey across a variety of both undergraduate and graduate programs across the country to fully examine the impact of COVID-19 on students' educational experiences. A larger, more representative sample with variables considering for sex, race, and ethnicity will enable extrapolation of these results to the student population as a whole. Additional work should aim to identify ways that academic support or specific teaching methods can be utilized to improve student success in virtual learning.

Conclusion

This pilot study defined a variety of changes experienced during the Fall 2020 semester by one class of undergraduate CSD students studying A&P at a single institution. Among these differences, students in this course interacted less with peers, instructors, and teaching assistants while experiencing an increased workload. Differences in the experiences of FGCS compared to traditional students included increased hours worked and feelings of being overwhelmed each week. FGCS also reported spending less time on course content each week.

Disclosures

Dr. Katelyn Kotlarek receives salary for full-time employment at University of Wyoming. She received the American Speech-Language-Hearing Association (ASHA) Advancing Academic-Research Careers (AARC) Award in 2020, which led to the corresponding study and collaboration

with Dr. Mandulak. The students surveyed as part of this study were enrolled in Dr. Kotlarek's *Anatomy and Physiology of Speech and Hearing* course.

Dr. Kerry Mandulak receives salary for full-time employment at Pacific University. She was provided with travel funds as a teaching mentor for Dr. Kotlarek through the ASHA AARC program. She serves on the editorial board of *Teaching and Learning in Communication Sciences & Disorders*. She served as the guest editor for the Special Forum in SIG 10 Perspectives entitled "Holistic Review for Graduate Admissions: Considerations and Starting Conversations."

References

American Speech-Language-Hearing Association. (2021). 2020 member & affiliate profile: Annual demographic & employment data. https://www.asha.org/siteassets/surveys/2020-member-and-affiliate-profile.pdf

Center for Applied Special Technology (CAST) (2018). Universal Design for Learning Guidelines (Version 2.2). http://udlguidelines.cast.org

Council of Academic Programs in Communication Sciences and Disorders. (2019). *Communication Sciences and Disorders Centralized Application Service 2019-2020 applicant data report*. https://growthzonesitesprod.azureedge.net/wp-content/uploads/sites/1023/2021/10/2019-2020-CSDCAS-Applicant-Data-Report-.pdf

Dhawan, S. (2020). Online learning: A panacea in the time of COVID-19 crisis. *Journal of Educational Technology Systems*, *49*(1), 5-22. https://doi.org/10.1177/0047239520934018

Fuse, A., & Bergen, M. (2018). The role of support systems for success of underrepresented students in communication sciences and disorders. *Teaching and Learning in Communication Sciences & Disorders*, *2*(3), 1-23. https://doi.org/10.30707/TLCSD2.3Fuse

Green, D. (2006). Historically underserved students: What we know, what we still need to know. *New Directions for Community Colleges*, *2006(*135), 21-28. https://dx.doi.org/10.1002/cc.244

Ishitani, T. T. (2006). Studying attrition and degree completion behavior among first-generation college students in the United States. *The Journal of Higher Education*, *77*(5), 861-885. https://doi.org/10.1080/00221546.2006.11778947

Kovacs, T. (2022). Assessing barriers to graduate school admission for applicants from underrepresented populations in a Master's level speech-language pathology program. *American Journal of Speech-Language Pathology*, *31*(2), 819-837. https://doi.org/10.1044/2021_AJSLP-21-00124

Lemoncello, R. (2015). Blended, active learning for anatomy & physiology: Development & program evaluation. *Perspectives on Issues in Higher Education*, *18*(2), 62-75. https://doi.org/10.1044/ihe18.2.62

Lubinsky, J. (2004). CSD graduate programs' entrance requirements for students without CSD backgrounds. *Perspectives on Issues in Higher Education*, 7(2), 6-7. https://doi.org/10.1044/ihe7.2.6

Mandulak, K. (2021). The Case for Holistic Review in Graduate Admissions in Communication Sciences and Disorders (CSD). *Perspectives of the Special Interest Groups*, *7*(2), 476-481. https://doi.org/10.1044/2020_PERSP-20-00137

Morris, M. E., Kuehn, K. S., Brown, J., Nurius, P.S., Zhang, H., Sefidgar, Y.S., Xu, X., Riskin, E. A., Dey, A. K., Consolvo, S., & Mankoff, J. C. (2021). College from home during COVID-19: A mixed-methods study of heterogeneous experiences. *PLOS ONE, 16*(6), 1-26. doi: https://doi.org/10.1371/journal.pone.0251580

National Center for Educational Statistics. (2020). *Integrated Postsecondary Education Data System*. United States Department of Education. https://nces.ed.gov/ipeds/use-the-data#

National Conference of State Legislatures. (2020, March 25). President Trump Declares State of Emergency for COVID-19. https://www.ncsl.org/ncsl-in-dc/publications-and-resources/president-trump-declares-state-of-emergency-for-covid-19.aspx

Orlikoff, R. F., Schiavetti, N., & Metz, D. E. (2015). *Evaluating research in communication disorders* (7th ed.). Pearson.

Pascarella, E. T., Pierson, C. T., Wolniak, G. C., & Terenzini, P. T. (2004). First-generation college students: Additional evidence on college experiences and outcomes. *The Journal of Higher Education*, *75*(3), 249-284.

Stephens, N., Hamedani, M., & Destin, M. (2014). Closing the social-class achievement gap: A difference-education intervention improves first-generation students' academic performance and all students' college transition. *Psychological Science*, *25*(4), 943-953. https://doi.org/10.1177/0956797613518349

Qualtrics. (2021). *Qualtrics.* (Version 10.21) Qualtrics. https://www.qualtrics.com

United States Census Bureau. (2020). *QuickFacts*. https://www.census.gov/quickfacts/laramiecitywyoming

RTI International. (2019). *First-generation college students: Demographic characteristics and postsecondary enrollment*. Center for First-Generation Student Success. https://firstgen.naspa.org/files/dmfile/FactSheet-01.pdf

Sedlacek, W. E. (1993). Employing noncognitve variables in admissions and retention in higher education. In *Achieving diversity: Issues in the recruitment and retention of underrepresented racial/ethnic students in higher education*. (pp. 33-39). Alexandria VA: National Association of College Admission Counselors.

Sylvan, L., Brock, K. L., Perkins, A., & Garrett, J. (2020). Building blocks of knowledge: A close look at prerequisite coursework for graduate programs in speech-language pathology. *Perspectives on Issues in Higher Education*, *5*(5), 1262 - 1271. https://doi.org/10.1044/2020_PERSP-20-00042

Terenzini, P. T., Springer, L., Yaeger, P. M., Pascarella, E. T., & Nora, A. (1996). First-generation college students: Characteristics, experiences, and cognitive development. *Research in Higher Education*, *37*(1), 1-22.

Tessel, C. A., & Grover, V. (2020). Graduate student retention of prerequisite course content. *Teaching and Learning in Communication Sciences & Disorders*, *4*(1), 1-33. https://doi.org/10.30707/TLCSD4.1/ULMQ3912

Theodore, R., Vander Werff, K., Woods, M., & Taylor, J. (2019). *Diving into the CSDCAS data: Benefits to programs, universities, and the profession.* Council of Academic Programs in Communication Sciences and Disorders, San Diego, CA. https://wordpressstorageaccount.blob.core.windows.net/wp-media/wp-content/uploads/sites/1023/2019/07/13-Diving-Into-CSDCAS-Data.pdf

University of Wyoming. (2020). *UW First Generation Students*. University of Wyoming. http://www.uwyo.edu/firstgeneration/

Vaismoradi, M., Turunen, H., & Bondas, T. (2013). Content analysis and thematic analysis: Implications for conducting a quality descriptive study. *Nursing and Health Sciences, 15*(3), 398-405. https://doi.org/10.1111/nhs.12048

Winkelmes, M. (2014). TILT Higher Ed: Transparency in Learning and Teaching. https://tilthighered.com/

Appendix

SURVEY QUESTIONS

Demographic Information

1. What is your year in school?
   Freshman Sophomore Junior Senior Post-bachelor (not graduate student) Graduate student
2. How many years have you been at [*university name*]?
   This is my first year. This is my second year. This is my third year. This is my fourth year. I have spent 5+ years here.
3. Are you a transfer student?
   Yes, from a community college Yes, from another 4-year university No
4. Is your major [*insert CSD-related major*]?
   Yes No
5. Is [*insert CSD-specific A&P course*] required for your major?
   Yes No
6. Do you plan on applying to graduate school in the future?
   Yes, for speech-language pathology. Yes, for audiology Yes, for a different field No I'm unsure if I will apply to graduate school.
7. If you are unsure about graduate school, which of the following factor into this decision? Select all that apply.
   Finances Unknown desire to work in this field COVID-19 Time commitment of education Family commitments Other:
8. Are you considered a first-generation college student?
   Yes, neither of my parents have a bachelor's degree. No, <u>one</u> of my parents has a bachelor's degree. No, both of my parents have a bachelor's degree.
9. Do you consider yourself a non-traditional student?
   Yes No
10. Do you have children?
    Yes No
11. Where is your primary residence this semester?
    [*Insert university location*] In my hometown within [*insert university state*]
    In my hometown outside of [*insert university state*] Other
12. What was your current GPA? Round to the nearest hundredths place (e.g., 3.25).
13. What is your <u>current grade</u> in [*insert CSD-specific A&P course*]?
    A (90.0% and above) B (80.0-89.9%) C (70.0-79.9%) D (60.0-69.9%) e)F (<59.9%)
14. What grade do you <u>expect to earn</u> by the end of the semester for [*insert CSD-specific A&P course*]?
    A (90.0% and above) B (80.0-89.9%) C (70.0-79.9%) D (60.0-69.9%) F (<59.9%)
15. In your opinion, how much does your mental health impact your academic performance?
    Never Sometimes About half the time Most of the time Always

Current Situation: Answer these questions based on your situation in the current semester:

16. How many hours per week are you employed <u>this semester</u>? Round to the nearest whole number.
17. Which of the following is true regarding the impact of COVID-19 on your employment situation? Select all that apply.
    The employment status of someone in my family was negatively impacted by COVID-19 (reduction in hours, furloughed, laid-off). My workload was reduced by COVID-19 (reduction in hours, furloughed, laid-off). My work increased due to COVID-19 (working more hours). Members of my family are considered "essential workers." I am considered an "essential worker." My family's employment has not been impacted by COVID-19. My employment has not been impacted by COVID-19.
18. Which of the following best describes your employment situation this semester?
    I need to work to support myself <u>and</u> my family. I need to work to pay for school. I need to work to support myself. I choose to work but don't have to. I don't work. I need a job but can't find one.
19. Approximately how many hours per week do you spend on material related to in [*insert CSD-specific A&P course*]? Round to the nearest whole number.
20. In comparison to your other courses <u>this semester,</u> which of the following is true regarding time commitment?

I spend more time on this course than other courses. I spend less time on this course than other courses. I spend the same amount of time on this course as other courses.

21. In comparison to other courses this semester, which of the following is true regarding difficulty?
    This course is the most difficult of all my courses this semester. This course is more difficult than my other courses. This course is similar difficulty to other courses. This course is not as difficult compared to my other courses. This course is the least difficult of all my courses this semester.
22. During this semester, approximately how often did you communicate one-on-one with your instructor?
    Never 1-2 times per semester 3-4 times per semester Once a month Once a week More than once a week
23. During this semester, approximately how often did you communicate one-on-one with your teaching assistant(s)?
    Never 1-2 times per semester 3-4 times per semester Once a month Once a week More than once a week
24. During this semester, approximately how often do you feel overwhelmed with academic work?
    Never/rarely Once every month Once every week Daily Only around the times of exams
25. Which of the following is true regarding your social interactions with peers during this semester?
    I communicate with my peers more now than before COVID-19. I communicate with my peers less now than before COVID-19. I communicate with my peers a similar amount now than before COVID-19.
26. Which of the following is true regarding your interactions studying with peers during this semester?
    I communicate with my peers more now than before COVID-19. I communicate with my peers less now than before COVID-19. I communicate with my peers a similar amount now than before COVID-19.
27. How much of a negative impact has COVID-19 had on your performance in in [*insert CSD-specific A&P course*] this semester?
    A great deal A lot A moderate amount A little None at all
28. How much of a positive impact has COVID-19 had on your performance in in [*insert CSD-specific A&P course*] this semester?
    A great deal A lot A moderate amount A little None at all

Virtual Learning: Answer the following questions about your experience with virtual learning.

29. What format are you currently taking your courses this semester?
    All face-to-face Mostly face-to-face (1 online) Half face-to-face and half online Mostly online (1 face-to-face) All online
30. Which of the following is true regarding your preference for course delivery?
    I do not have a preference. I prefer online delivery. I prefer face-to-face delivery.
31. Which of the following describes your current technology (computer, software, WI-FI, etc.)?
    I have the appropriate technology to be successful in my courses. I do not have the appropriate technology to be successful in my courses.
32. If you do not have the appropriate technology, please explain.
33. In my opinion, online classes in general are:
    More difficult than in-person classes Equally as difficult as in-person classes Less difficult than in-person classes It depends on the class and/or instructor.
34. If you do not have the appropriate technology, please explain.
35. How helpful do you believe the university has been in your transition to online classes this semester?
    Extremely helpful Very helpful Moderately helpful Slightly helpful Not at all helpful
36. How helpful do you believe your instructor for this class has been in your transition to online classes this semester?
    Extremely helpful Very helpful Moderately helpful Slightly helpful Not at all helpful
37. How helpful do you believe your instructors (in general) have been in your transition to online classes this semester?
    Extremely helpful Very helpful Moderately helpful Slightly helpful Not at all helpful
38. How often are you distracted while watching online recorded lectures?
    Never Sometimes About half the time Most of the time Always

Previous Semesters: Answer the following questions about your experience in previous semesters.

39. During previous semesters, approximately how many hours per week have you typically worked at a place of employment? Round to the nearest whole number.

40. In comparison to courses in previous semesters, which of the following is true regarding your time?
    I spend more time on this course than previous courses I spend less time on this course than previous courses I spend the same amount of time on this course as previous courses. This is my first semester in college.
41. Which of the following describes your employment situation during previous semesters?
    I regularly worked to support myself and my family. I regularly worked to pay for school. I regularly worked to support myself. I chose to worked but didn't have to. I didn't work. This is my first semester in college.
42. Compared to previous semesters, which of the following is true regarding course difficulty?
    This course is the most difficult of all my courses. This course is more difficult than courses in previous semesters. This course is similar difficulty to courses in previous semesters. This course is less difficult than courses in previous semesters. This course is the least difficult of all my courses. This is my first semester in college.
43. In comparison to previous semesters, which of the following is true regarding your employment schedule?
    I'm currently working more than during previous semesters. I'm currently working less than previous semesters. I'm currently working about the same amount compared to previous semesters.
44. In comparison to previous semesters, which of the following is true regarding your performance?
    I am performing better in [*insert current semester*] than during previous semesters. I am performing worse in [*insert current semester*] than during previous semesters. I am performing the same in [*insert current semester*] than during previous semesters. This is my first semester in college.
45. How would you describe your academic workload this semester compared to previous semesters?
    I am taking more credits this semester than I have in previous semesters. I am taking equally as many credits this semester as I have in previous semesters. I am taking less credits this semester than I have in previous semester This is my first semester in college.
46. During previous semesters, how often did you communicate one-on-one with instructors?
    Never 1-2 times per semester 3-4 times per semester Once a month Once a week More than once a week I did not attend college before this semester
47. During previous semesters, how often did you communicate one-on-one with teaching assistants?
    Never 1-2 times per semester 3-4 times per semester Once a month Once a week More than once a week I did not attend college before this semester
48. During previous **face-to-face** courses, how often were you distracted listening to lectures?
    Never Occasionally Sometimes Frequently Always I have not taken any face-to-face courses.

Final Questions:

49. Is there anything else you would like to tell us regarding the content from this survey?
50. Are you currently enrolled in in [*insert CSD-specific A&P course*] at the [*insert university*]?
    Yes No