

Reflections on Undergraduate Research and the Value of Resilient Pedagogy in Higher Education

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Abstract: This paper utilizes anonymous qualitative survey commentary from seventy-three faculty to explore how perceptions of teaching undergraduate researchers during the COVID-19 pandemic reflect the practice of resilient pedagogy. By examining faculty motivations, experiences in times of disruption, and resiliency beyond the pandemic, this paper contributes to and extends the existing scholarship on resilience and resilient pedagogy in higher education.

Keywords: COVID-19, pandemic, disruption, undergraduate students, undergraduate research, resilience, resilient pedagogy.

I LOVE running undergraduate research online. I meet students individually in Zoom and coach them there. There is greater flexibility to meet. I can meet them when their babies are napping or sleeping, or they are home late from work. I think teaching online synchronous [sic] is the best way to teach an undergraduate research course. I am a better teacher because of COVID[-19] because COVID[-19] made me learn how to teach online.

Within the epigraph above, one of the anonymous survey respondents shared their reflection on how the swift shift to online learning in early 2020, due to the COVID-19 global pandemic, provided them with an opportunity to reevaluate their pedagogical practices mentoring undergraduate research (UGR) projects. The qualitative data collected are situated within the context of university-based undergraduate instruction at a public Southeastern University in the United States. Like many of the research participant's responses, the response above conveyed a desire to mentor, support, and teach undergraduate researchers. Participants noted that the COVID-19 pandemic provided the context to learn new and innovative instructional methods that broadened their ability to reach more undergraduate student researchers. Given that there is no 'universal undergraduate student,' online pedagogical methods and conferencing tools, such as Zoom or Microsoft Teams, can be used to support diverse students who may have experienced additional disruption or stress, whether they are parents or work beyond the nine-to-five workday. We argue that the anonymous participant narratives shared in the current study reflect the desire on the part of university educators to engage in pedagogical methods that are student-centered, adaptive, and resilient—as noted in the epigraph above, "COVID[-19] pandemic] made me learn how to teach online."

Scholars who engage in direct practice work within fields such as social work, psychology, and criminal justice often frame resilience as a personality trait and/or a dynamic process that marginalized peoples encounter and experience to overcome strife and inequality (Herrman et al., 2021; MacLeavy et al., 2021; Schwartzman, 2020). Moreover, Herrman et al., (2011) further suggest that “resilience refers to positive adaptation, or the ability to maintain or regain mental health, despite experiencing adversity” (259). Josh Eyler, Director of Faculty Development at the University of Mississippi, suggests that “resilient pedagogy is a course design strategy that helps make your classes, assignments, and assessments as resistant to disruption as possible. The way to think about this is regardless of which modality you’re teaching in—online, in-person, or blended—you’re designing one time and one time only” (Gardner, 2020). As discussed, fully below, resilient pedagogy provides educators with a toolkit to minimize disruption, offer all students support no matter what modality is used, and center the students in their capacity to learn, grow, and ideally, change. Importantly, scholars and practitioners alike are engaging resilient pedagogy as a framework that plans for instead of reacting to the potentialities of disruption. For resilient pedagogues, students are not required to bear the brunt of the burden of resilience; instead, the pedagogy does.

Resilient pedagogy can be a useful strategy within times of disruption, such as the COVID-19 pandemic, as well as beyond. Importantly, none of the faculty members who completed the survey noted that their pedagogical methods were resilient; instead, their comments center on flexibility in course design and delivery, diversity of instruction modality, as well as undergraduate learner accessibility. This paper provides context as to how reflections on university-based instruction, teaching, and pedagogy *echo* the concept and positively contribute to the development of *resilient pedagogy*—in theory, and practice. Given that there is a paucity of empirical scholarship on the utility and purchase of resilient pedagogy, we offer this paper to begin the discussion on how university-based faculty members are already approaching undergraduate teaching and learning through resilient pedagogical practices and provide recommendations for the future.

This paper has two central research questions: 1) How do the teaching practices of university-based faculty during the COVID-19 pandemic reflect the concept of resilient pedagogy? 2) How do university-based faculty perceive aspects of resilient pedagogy as impacting their teaching beyond the COVID-19 pandemic? We base this inquiry on narratives of faculty members shared within a Qualtrics survey that asked how these interdisciplinary faculty members supported UGR during the 2020 COVID-19 pandemic. Preliminary findings from the survey address the unique pedagogical challenges faced by university-based faculty; however, given the global dialogue on resilient pedagogy as a *sustainable* and student-centered approach to teaching and learning, this paper reflects upon the utility of resilient pedagogy amongst university-based faculty well beyond the COVID-19 pandemic.

Literature Review: A Pandemic/Resilient Pedagogy?

The COVID-19 pandemic impacted all sectors of society and facets of day-to-day life. Many businesses and types of industries were forced to pivot to new modalities and strategies or cease operation altogether. In higher education, the immediate response of most colleges and universities was to move all educational activities to an online framework. The degree to which campus closures and lockdowns took place varied widely by location, however, all university systems were impacted in some way (Crawford et al., 2020). For some educational institutions and university systems, a move to online learning was somewhat smooth, while for others it represented a wholesale change in the way they provided education (Schwartzman, 2020; Day et al., 2021).

There were significant variations *within* higher education institutions as well, as some faculty members have extensive experience teaching online while others had very limited experience or none (Rashid & Yadav, 2020; Lion, 2021; Cahill et al., 2021). These differences were perhaps even more

pronounced for faculty mentoring UGR projects (Erickson et al., 2022). Some forms of UGR can easily be transferred online while others proved much more difficult. Faculty had to reassess their course objectives and assignments to consider how undergraduate researchers would engage in research activities and dissemination. In addition to changing the strategies and tools for conducting UGR, faculty also had to navigate changes in the assessment of students for their participation in research activities and dissemination, whether embedded into a credit-earning course or not. These issues were even further complicated by the increasing equity gap in access to undergraduate research (Bhattacharyya & Chan, 2021; Haeger et al, 2021), which was only exacerbated by the pandemic. The following section outlines the existing literature on engaging in UGR during times of disruption and the use of resilient and flexible pedagogical strategies.

While faculty from most disciplines encountered challenges related to their engagement in research during the COVID-19 pandemic, the specific nature of those challenges varied based on the type of research and/or creative activity (Wigginton et al., 2020). For faculty research requiring human subjects, in-person data collection activities ceased. Faculty that required lab space and/or sophisticated equipment encountered their own set of barriers to continuing research when they could no longer provide that space/equipment for students to use (Day et al., 2021).

Faculty Involvement with Undergraduate Researchers

Faculty members become involved in UGR for a variety of reasons, including interest in mentoring students (Baker et al., 2015) and the potential to increase diversity in the academy (Morales et al., 2017). At institutions where teaching is the primary responsibility of faculty members, time spent engaged in research activities of any type may seem at odds with time spent teaching. This is especially true in terms of UGR and course-based undergraduate research experiences (CUREs), which require extra time above and beyond the typical workload in teaching and research (Beer & Thompson, 2017). Furthermore, formal recognition of these activities is often lacking and takes many forms depending upon the institution and discipline (Schultheis et al., 2011). Even pre-pandemic, many faculty members perceived significant barriers to participating in UGR, including time, funding, and lack of recognition of their work (Baker et al., 2015).

Supporting Undergraduate Researchers During the COVID-19 Pandemic

While little research has been published on faculty experiences with UGR during the COVID-19 pandemic, there is some recent scholarship highlighting several strategies for overcoming barriers related to undergraduate student mentorship that arose or were exacerbated by the pandemic. Tripepi and Landberg (2021) describe a protocol they developed for engaging in wildlife research during the COVID-19 pandemic that involved setting up remote cameras to observe animal behavior—these research activities could be completed remotely and asynchronously. Conducting research for English or Art History CUREs, accessing a physical archive proved to be more difficult, even impossible, during the beginning stages of the COVID-19 pandemic due to closures and other social distancing policies.

Some researchers have investigated how student experiences inside and outside the classroom were affected by the shutdowns associated with the COVID-19 pandemic. Deveau et al., (2021) describe strategies used to convert a chemistry CURE in the online context. The faculty involved were able to move team meetings online and overcame laboratory obstacles by completing experiments themselves and sending data electronically to students (Deveau et al., 2021). Since the students had already engaged in hands-on experiments earlier in the course, they did not miss out on the benefit of

this portion of the CURE but could still complete virtual presentations by using lab results (Deveau et al., 2021).

While findings regarding declining student engagement and interest are common in this literature (Deveau et al., 2021; Qiang et al., 2020), other research has highlighted nuances of how student involvement and interest were affected. Yowler et al. (2021) evaluated the design of a four-week course titled “Summer Foundations in Research” that was implemented virtually with undergraduate students at the Mayo Clinic in the United States. The program was developed when all in-person fellowship and research opportunities were cancelled (Yowler et al., 2021). Evaluation of the program indicated that it was successful in increasing research knowledge and improving well-being outcomes for undergraduate student participants (Yowler et al., 2021).

Wang et al. (2020) investigated how student interest in UGR changed compared to before the COVID-19 pandemic in several CUREs. Results indicated that student interest decreased overall but varied based on how much students reported engaging in “meaning-making” during the course (Wang et al., 2020). Meaning-making was measured using a scale developed by Wang et al. (2020) that asked questions such as “In this course, I strived to make whatever I was learning as useful as possible,” and “During the online course after Spring Break, I was able to see the connections between learning and my academic or professional goals.” Students that were high on the meaning-making scale displayed a significantly smaller decrease in interest after the CURE activities moved online due to the pandemic. The authors posit that students who were able to see the value of the research experience to their goals evidenced smaller decreases in engagement due to this recognition of the relevance of those activities. In turn, students seem to be motivated to *be* resilient.

The Utility of Resilient Pedagogy During Times of Disruption

While studies regarding student experience are important and highlight how these outcomes for students changed during the pandemic, less is known about the faculty perspective. The concept of resilient pedagogy emerged in popularity in the spring and summer of 2020, spurred on by the onset of the COVID-19 pandemic. A series of blogs published by *Inside Higher Ed* proposed the idea initially emphasizing the need to plan for disruption in the future as the events of March 2020 created chaos throughout the academic world (Devaney & Quintana, 2020). A definition of resilient teaching began to emerge:

We define resilient teaching as the ability to facilitate learning experiences that are designed to be adaptable to fluctuating conditions and disruptions. This teaching ability can be seen as an outcome of a design approach that attends to the relationship between learning goals and activities, and the environments they are situated in. Resilient teaching approaches take into account how a dynamic learning context may require new forms of interactions between teachers, students, content, and tools. Additionally, they necessitate the capacity to rethink the design of learning experiences based on a nuanced understanding of context (Devaney & Quintana, 2020).

While many studies do not use the language of “resiliency” or “resilient pedagogy” in their discussion of strategies used by faculty, the choices made by many faculty members can be conceptualized as decisions that increase resiliency in course design and pedagogical strategies generally. Coming from a social sciences discipline, Bonanno (2004) notes, “in the developmental literature, resilience is typically discussed in terms of protective factors that foster the development of positive outcomes and healthy personality characteristics among children exposed to unfavorable or aversive life circumstances” (20). In pedagogy, this concept can be reframed to encapsulate elements

built into course design that foster the development of positive outcomes within the course. Resilience has been studied from a variety of perspectives, but most focus on a variety of factors that impact this trait, including individual, family, and societal aspects. All of society had to exercise resilience in some form or fashion during the COVID-19 pandemic, but the faculty displayed this in unique ways. Although this is often considered an individual trait, communities and larger groups can also display resilience (Norris et al., 2008).

Schwartzman (2020, 510) argues that during the early stages of the COVID-19 pandemic, “A more holistic approach to resilience can activate personal and collective agency in non-exploitative ways. This version of resilience, contrasting with neoliberal usage, treats resilience as a foundation for furthering inquiry, deepening civic engagement, enriching connectivity with others, and stimulating perseverance.” Resilient pedagogy grew from the theory of resilient design which seeks to consider a broad range of potentialities and plan the design to be accessible to all users. For example, a resilient architectural design might be LEED (Leadership in Environmental and Energy Design) certified while also including the short-term needs of the users and the long-term needs of the environment.

Course design scholar Tange (2020) wrote, “[Resilient design] accomplishes these things by anticipating foreseeable problems, reducing the complexity of any given solution while also recognizing that single solutions are often less useful than multiple ones, building in redundancies, and identifying and building upon a foundation of local resources and strengths.” These are the three guiding principles of resilient design: extendibility, flexibility, and redundancy (Quintana, 2021; Tange, 2020). To build a resilient course, instructors must envision what might change as the semester progresses and predict the possibilities. They must also be flexible and plan multiple responses to potential changes in the educational context. And finally, instructors must include redundancies by identifying ways they can create interchangeable learning activities to respond to changing environments and circumstances (Quintana, 2021). An example of this would be when introducing a new theoretical concept to students, to have students complete a reading on the concept, engage in a classroom discussion or reflection (virtually and/or in person) as well as complete a practical application activity like a role-play or case study. Scholars and practitioners continue to discuss the impacts and effects of the COVID-19 pandemic on university-based instruction and course design; our project makes use of qualitative survey data to explore how faculty’s reflections on pedagogical challenges and possibilities of teaching UGR reflect the core tenants of resilient pedagogy.

Research Design

To understand the ways interdisciplinary university-based educators’ pedagogical practices during the COVID-19 pandemic in 2020 (in Spring, Summer, and/or Fall semesters) reflect or transcend the current resilient pedagogy literature, this study critically engages qualitative survey commentary. Qualitative survey data provide this project with a chance to undertake an in-depth analysis of the topic (Braun & Clarke, 2006; Jansen, 2010) while also examining participants’ open-ended answers provided within the ‘other’ comment box. A Qualtrics survey was used to ensure diverse and anonymous perspectives were collected and analyzed to make sure different disciplines and perspectives could be represented.

To be eligible, faculty members had to meet the following criteria: 1) be over the age of 18; 2) be a current faculty member at the Southeastern University, and 3) have engaged in undergraduate student research mentorship during the 2020 COVID-19 pandemic. Using purposive and snowball sampling methods, faculty were recruited through electronic mailing lists and individual solicitation. Participation was strictly voluntary, and no compensation was provided. The survey was approved by Southeastern University’s IRB; all information was kept confidential. No IP addresses nor personal

information were collected or asked of participants. The demographic information of participants remained anonymous.

The survey was designed to inquire as to how faculty engage undergraduate researchers, their motivations for supporting undergraduate researchers, and any reflections on their pedagogical strategies before and during the 2020 COVID-19 pandemic. This paper focuses on the qualitative commentary provided within the survey that reflects or extends the core principles of resilient pedagogy. Seventy-three faculty members completed the survey. The anonymous qualitative commentary was analyzed using thematic analysis (Braun & Clarke, 2006); primary and secondary coding was used to synthesize the data and draw out themes (Kvale & Brinkmann, 2009). The coding of themes revolved around how COVID-19 impacted faculty roles and responsibilities, disrupted their classroom, assignments, and capacity to reach students, and their learning of new technology. Importantly, amongst all these discussions was the undercurrent of resilience and resilient pedagogy around how to support undergraduate researchers during times of disruption through flexibility, diversity of instruction modality, and learner accessibility. The thematic analysis revolved around: 1) Why faculty have become involved in teaching undergraduate researchers; 2) How the pedagogies of faculty have changed within the context of the COVID-19 pandemic; and 3) How faculty pedagogical reflections and changes related to teaching align or extend the resilient pedagogy literature. The scholarship on and definition of resilient pedagogy was used to help organize the themes into the categories below with a focus on holism, flexibility, diversity, as well as accessibility. The following section combines the data analysis and discussion section to weave together the qualitative findings with relevant resilient pedagogy literature to show how participants, even if unknowingly, are *being* resilient in their pedagogical approach and course design.

Faculty Experiences Mentoring Undergraduate Researchers during COVID-19 Pandemic

As noted above, this literature on resilient pedagogy has often been framed through theoretical discussions, or using case studies; there remains a paucity of scholarship utilizing empirical methods to extrapolate how the pedagogy of university-faculty are resilient in their teaching, instruction, and course design. The qualitative empirical data was collected from a survey of seventy-three faculty members mentoring undergraduate researchers who discuss changes because of the disruptions caused because of the COVID-19 pandemic. It is to be noted that the faculty reflections may not be universal to all institutions or contexts; the institution where the survey was conducted is a public university located within a politically conservative state. While not all the participants may have agreed, the university was given clear direction and policy guidance on how to proceed during the COVID-19 pandemic from the larger university system to which it belongs. This placed constraints on how the university could respond to the pandemic while also supporting student success. As one participant reflected: “They [the university] put policies in place putting me and my students at risk (mandating face-to-face class meetings).” In most cases, these policies were driven by state-level decisions and university administrators were not able to stray from the university system guidance. While some faculty expressed concern over university policy and reaction to COVID-19, responses from many respondents focused on individual reflections regarding their own experience mentoring undergraduate researchers during this time of great disruption.

Three categories of reflection emerged: 1) Reflections on supporting undergraduate researchers; 2) Reflections on pedagogy change during the COVID-19 pandemic, and 3) Reflections that reflect key concepts of resilient pedagogy literature. Within each of these categories, we describe subcategories below. The following reflections provide nuance and context regarding faculty members' reflections on mentoring undergraduate students in research during the COVID-19 pandemic.

Reflections on Supporting Undergraduate Researchers

Embedded within the resilient pedagogy literature is an invitation to engage in holistic and accessible teaching that evades disruption (Schwartzman, 2020). Within this category the faculty members' commentary provides an in-depth look at why they become involved in supporting undergraduate researchers: 1) Furthering their research or scholarly expertise (A1); 2) Student growth and development (A2); and 3) Personal experiences and anecdotes (A3). A1: The university is not unlike other institutions—if faculty members have resources, they can effectively get ahead and become more productive. One faculty member shared that they support undergraduate researchers as “research assistants that help move [faculty members'] research forward.” Another participant shared that engaging in UR mentorship supports their research and scholarly innovation:

I have 20+ years [of] teaching and practicing in my field; I have co-written a published [textbook] on my work, as well as having other awards, publications, and productions. The work my students and I create together further explores and [creates] content for and with audiences in my field.

Not only do these faculty members want to expedite their research projects, but they also indicated that undergraduate student researchers provide opportunities for further exploration and creativity, which may not be possible on one's own or within a vacuum.

A2: Another reason faculty members support undergraduate researchers is to contribute to their success and growth. One respondent noted that: “My teaching and formal practice in the field feed and inform each other; they are fundamentally inseparable. My [goals] as both an artist and a mentor [are] to help nurture and inspire new creative voices.” Another faculty member shared that they work with undergraduate students who are particularly “interested in a topic to cultivate their research skills.” Another respondent shared that critical thinking skills are also important, whereby they note: “I hope it helps them in graduate school or professional schools.” Given that many undergraduate researchers work toward developing a mastery of content, this faculty member has taken it upon themselves to support research and critical thinking skill development. Moreover, as another faculty member noted, supporting UGR also fuels their excitement about certain topics and expertise by modelling how research can support undergraduate students' future goals.

A3: Other participants shared that they do this work out of a deep desire to make a difference among the students they mentor:

It [supporting undergraduate researchers] is a way for me to redeem the years that were taken from me due to ‘misguided mentors.’ It fills me with joy to know that my one life can make a meaningful and positive impact on others—knowing that they will go much farther than I because of my investment in them at this time.

This faculty member experienced what they call *misguided mentorship*. To correct this, they utilize their faculty role with undergraduate researchers to make a positive impact. As we will note fully below, this discussion of redemption can also reflect elements of resilience by reclaiming their experiences through undergraduate student mentorship.

Increased labor and time on the part of faculty to mentor undergraduate students remains a common theme throughout the survey responses. One faculty member shared: “I love guiding students and helping them see their potential and that the work they do matters. I am a lecturer, so this is mostly done on my own time or as service. The only thing that differs is the modality of instruction and mentoring.” While the primary responsibility of lecturers is to teach courses, this

faculty member shared that they continue to mentor undergraduate researchers even when that work falls outside of their existing job responsibilities.

Finally, not only are faculty members encouraging students to engage in professional and personal development through meaningful research development and output, but the work that happens within the academy can positively benefit the community: “Research meaningfully increases undergraduates' engagement with their community and the world beyond, and in particular it enables students with various disabilities to deepen their understanding of the subject/topic.” Supporting students with disabilities on being successful within the academy reflects core tenants of resilient pedagogy: accessibility and student-centeredness (Schwartzman, 2020). While faculty are involved in UGR mentorship in a variety of ways, it is undeniable that their pedagogical methods were interrupted or challenged during the COVID-19 pandemic.

Reflections on Pedagogy Change During the COVID-19 Pandemic

While much of the literature on resilient pedagogy has emerged from the COVID-19 pandemic and its impact on teaching and learning; little empirical data has been engaged regarding the trials and tribulations of faculty mentoring undergraduate researchers during the pandemic. Within this category, three subcategories emerged from the data: 1) Disconnect/disruption to teaching (B1); 2) Disconnect/disruption to research (B2); and, 3) Emotional health/wellbeing-impact (B3). B1: Interdisciplinary faculty shared that the COVID-19 pandemic provided them with the space to engage in pedagogical innovation: “I did not take classes to learn how to do undergrad research online. Instead, I just learned how to teach online. I had never done that before and after that, I am just inventive.” Another faculty member shared: “We have had to think outside the box in terms of how to go about reaching and engaging our audiences. We have moved everything from in-person to online, so much of our approach is new territory for me and my students.” While many virtual training opportunities were available to faculty at their institution and beyond, learning to teach online and adapt learning methods is a central component in the resilient pedagogy literature (Quintana, 2021; Schwartzman, 2020; Tange, 2020).

While the move to online conferencing technologies has been presented as a seamless transition by university administrators, one faculty member shared: “Access has been more difficult with the socially distanced classroom. Normally I would work more closely with those students in my face-to-face classes, however, I only see them once per week rather than three times.” Faculty members in the survey overwhelmingly noted that constraints were placed upon student meetings and office-hour meetings. One faculty member noted: “I had to move more meetings with students to virtual meetings due to socially distanced classrooms.” Moreover, one respondent shared that virtual conferences offered more opportunities for faculty and undergraduate researchers alike given that they were less time-consuming to participate in due to the lack of travel constraints. Many faculty members shared that the COVID-19 pandemic “caused logistical headaches that are otherwise not present, and it forces me to keep the team smaller than usual. It also makes training more complicated.” While some reflections on teaching during the pandemic have noted more difficulty than a promise, one faculty member shared: “I have also tried to be understanding and patient, letting students know that it's okay if we have to slow down with research.”

Moreover, knowledge dissemination, such as academic poster presentations, also had to be re-envisioned: “It has been difficult to find ways to include assessments of student learning from faculty members or others from outside of the course.” Another respondent spoke about the ways student research presentations evolved through the COVID-19 pandemic:

Mentoring individual research online ... as compared to in-person. ... Some presentations are static videos and you do not have to prep the students for questions. Some are live presentations with questions throughout or at the end. I have prepped [sic] students for interviews to be selected as a plenary speaker at the conference. With COVID[-19] research you must be flexible, and you must be able to learn new ways to present and be innovative, to get the attention of the people to whom you are presenting your research.

While this faculty member shared that some of the work to mentor undergraduate researchers needed to change when conducted online, the change presented opportunities to be resilient in one's pedagogical approach, and present scholarship and research in innovative ways.

Other faculty members shared that they were able to learn new software or utilize the course software such as the rubric or checklist function:

Short, very visual, recorded lectures [and discussion boards] ... [I learned] how to edit short videos [and utilized] more digital and audio recordings of plays for students to use. ... Lots of email check-ins with students as well as live video chats. Always checking in/responding more quickly to email. Letting them know I am there and listening and that I care.

Evolving out of these pedagogical challenges and personal/professional resilience, this faculty member "became way more conscious of being available in a time of great stress. Had to also really think about how to balance that for me so I didn't burn out." In line with resilient pedagogy, and the impacts of the COVID-19 pandemic generally, faculty members shared that the swift change to online instruction resulted in needed reflection on what is and is not working for students (Quintana, 2021; Schwartzman, 2020; Tange, 2020). Moreover, one faculty member noted a decrease in undergraduate student research generally, noting: "One student decided not to engage in research with me in [the] Fall 2020 due to COVID social distancing concerns ([e.g.] the student did not think the experience would be as good virtually as in-person). One student decided not [to] continue in Spring 2021 due to being over-committed."

B2: While much of the discussion of the COVID-19 pandemic and disruptions caused emerged from reflections on pedagogy and undergraduate student mentorship, other faculty members discussed the ways academic research and creative activity had been impacted. For example, one faculty member noted: "The biggest impact [has been on] how I recruit students. [It is] tougher to identify strong, interested students in class without much face-to-face interaction." Echoing the faculty members' discussions of pedagogy, online modalities may make it difficult to recruit students for research projects. Another faculty member shared that the COVID-19 pandemic had changed the capacity in which undergraduate researchers could engage in internships and field placements. Moreover, two participants shared that undergraduate student data collection, such as those that occur within labs, or interdisciplinary social sciences had been halted completely; whereas two other faculty members noted that their face-to-face focus groups moved to an online venue, changing the way qualitative research could be conducted. Lastly, another faculty member shared that their undergraduate student researchers encountered difficulties regarding institutional ethics approvals related to COVID-19 research restrictions: "delays in approval and changing requirements greatly impacted projects."

B3: While undergraduate student research output and participation have changed because of the COVID-19 pandemic, other faculty shared larger concerns related to student health and wellbeing. For example, one faculty member shared: "I [have] pared down my lab and now mentor fewer students than ever. Why? Because 3 students in my lab (out of 10, [e.g.] 30%) have already tested positive for COVID-19 and I have no intention of letting an asymptomatic spreader get me (or anyone else) sick."

The increased risk of teaching face-to-face even with social distancing and other health and safety measures in place has required faculty to consider their health and well-being when engaging in UGR mentorship, such as lab work that can often require working together in close quarters. In line with a faculty member discussing their teaching of undergraduate researchers as “more time-consuming,” this faculty member shared:

Students, like faculty, staff, and administrators, have had to do more with less. Less time and less energy. ... So if anything has changed in light of COVID-19 it is that WE HAVE CHANGED and thus WE must consider this when moving forward with services, programs, activities, advocacy, research, resources, referrals, and the like.

While much of the discussion has revolved around the potentials and possibilities of resilient pedagogy, we would be remiss to leave out the additional emotional burden and labor faculty have taken on to support their students during the COVID-19 pandemic. Despite these difficulties, this faculty member has shared that all aspects of university life have been altered and have required various degrees of resilience and adaptation. Finally, as noted by one faculty member, the university must do away with treating everyone as individuals; instead, a team framework can be helpful and needed during such difficult times: “We are human beings and not human doings. As such, when I work with my students, peers, and colleagues I seek a balance between time, task, and energy management to ensure that our team's goals are met, but not at the detriment [sic] of our team member's wellbeing.”

Reflections on Cultivating Resilience and Engaging Resilient Pedagogy

Reflecting on how the course design and pedagogical changes experienced and implemented due to COVID-19 align with the concept of resilient pedagogy, four subcategories emerged from the data in this category: 1) The importance of faculty support (C1); 2) The relationships with students (C2); 3) The desire to inspire change (C3); and 4) The experience of failure as contributing to and even extending the resilient pedagogy literature (Quintana, 2021; Schwartzman, 2020; Tange, 2020) (C4). These themes will be examined and explored through the experiences shared by the participants. While none of the participants explicitly discussed resilient pedagogy in their responses, all the responses reflected flexibility and redundancy (Quintana, 2021; Tange, 2020), which are two of the guiding principles of resilient design. Participants in this study engaged in cultivating resiliency through and within relationships across and beyond the university.

C1: One participant spoke about the importance of recognizing their limits and relying on relationships established with faculty across and beyond the university. “I am ... constantly learning. I consult with colleagues as needed whose specialties...are not my expertise. In this case, the colleagues come in as a co-mentor on the project.” This faculty member acknowledged that continual learning happens in and with the connection and support of others. By recognizing their limitations and seeking support from others, the participant was reflecting resilient pedagogy’s call for educators to take an inclusive and holistic view of teaching and learning (Quintana, 2021; Schwartzman, 2020; Tange, 2020). From the perspective of resilient pedagogy, courses and projects that are designed to be inclusive are by default more resilient as they can be easily accessed by all students. Moreover, this quote emphasizes the desire on the part of the faculty member to plan, acknowledging that there are limits to their knowledge and scope—they rely on their relationships to support the development and growth of undergraduate student researchers. As Schwartzman (2020, 512) argues, “resilience as endurance emerges in the capacity to acknowledge limitations, withstand adversity, and persevere.”

C2: Another faculty member spoke about the required flexibility and adaptations needed in all areas of teaching and learning. “We've had to [have] more flexibility in terms of everything and just

roll with things. For example, data collection plans changed...We've also had [to] change due dates due to students being sick.” Resilient pedagogy stresses ongoing flexibility: within the context of supporting UGR, the need to navigate research projects while supporting students’ health and well-being is aligned with the central tenets of resilient pedagogy. The call to offer flexibility to students reflects *trauma-informed pedagogies* that respond to changing environments and circumstances. Also mentioned within the resilient pedagogy literature, trauma-informed pedagogy “positions learning within a dual-continuum model of mental health ([e.g.,] addressing one’s deficits and building on one’s strengths are two specific and differentiated pathways for intervention) to address domains of healing and growth in trauma-affected students” (Brunzell, Stokes, & Waters, 2016, 219).

C3: In addition, another participant shared that recognizing the additional stress students were experiencing, in addition to their academic misgivings, guided their efforts to be not only flexible but also concerted: “I got a lot more flexible. Knowing the stress, we were all undergoing I worked with students individually as needed in terms of due dates and adjusted many of my specific tasks and projects.” Several participants noted that providing flexibility did not mean that students were less challenged, or classes were less rigorous. Instead, providing this flexibility meant raising the bar so to speak, and supporting students in achieving their potential, whether that be academic, professional, or creative. As one participant noted, “the skill level of the student should be challenged and raised, but that also means there must be ... flexibility within the instruction/mentoring portions of the course.” Engaging resilient teaching requires all educators to rethink and redesign learning experiences that reflect a deeper understanding of context no matter what modality is being used. Survey participants shared that within the COVID-19 pandemic context they redesigned learning experiences for undergraduate student researchers to provide them with a foundation for success, while also engaging in more personalized course design and collaborative learning. As one participant stated: “I try to meet students where they're at and create goals together.”

C4: Participants highlighted the guiding principle of redundancy and flexibility (Quintana, 2021; Tange, 2020) in resilient design as critical factors in the learning process for students. Learning takes time and supporting undergraduate student researchers, often through skills building, demonstrates perseverance to the individual student, faculty mentor, and the larger educational context. Echoing the guiding principles of resilient design of flexibility and redundancy (Quintana, 2021; Tange, 2020) one participant shared that “learning how to interpret and integrate data is a learned trait, and it doesn't come immediately to many undergrads. With time (and multiple iterations of integration), they eventually get it.”

The reflections we gathered from participants revealed how the COVID-19 pandemic created a new context for faculty supporting undergraduate researchers, requiring them to innovate and discover new means of working with students. While the questions posed to faculty did not include references to resilient pedagogy specifically, many of the narrative responses from participants reflected key concepts from the literature on resilient pedagogy. Furthermore, some of these innovations resulted in the exposure of inequities that already existed within the undergraduate student population, such as students’ educational training and research knowledge, as well as their learning styles and socioeconomic status, thus begging the question: might it benefit students if their teachers applied the principles of resilient pedagogy all the time?

Moving Beyond the Pandemic: Resilient Pedagogy in Practice

Following faculty reflections on teaching during the COVID-19 pandemic and their resulting pedagogical challenges, we end this paper with some recommendations for educators in higher education. As we have suggested, resilient pedagogy calls for educators to take an inclusive and holistic view of the learners in our courses. This includes acknowledging the trauma that many of our students

have endured throughout their lives. Trauma-informed pedagogies are those that draw from the science of how trauma affects humans and seek to mitigate the effects (Imad, 2020). Recognizing and acknowledging that trauma influences how students learn is the first step in working to overcome the barriers that trauma places in front of our students. Additionally, responses highlighted other areas with room for improvement that were perhaps more fully exposed by the experience of the pandemic. We discuss recommendations in the areas of trauma-informed pedagogy, accessibility, and general course design below.

Trauma: A resilient pedagogical approach takes into consideration how COVID-19 has caused a lot of trauma in our lives; we are reminded that students come to class with their unique experiences and engagements with the world. The data gathered suggest faculty pedagogy was modified to meet students where they were at and support their learning by taking into consideration their health and well-being, work-life balance, as well as knowledge/skill level. Faculty shared that responding to trauma allowed them to enrich their pedagogical approaches to provide more students with opportunities to be successful.

Accessibility: The pedagogical lessons learned during the COVID-19 pandemic may offer a more accessible educational experience to historically excluded and marginalized groups. The educators' reflections have shown how resilient pedagogy can support more students, providing multiple opportunities to engage in the research process. For example, one participant noted "flexibility within the instruction/mentoring portions of the course" and "lots of email check-ins with students as well as live video chats." We encourage faculty members to engage in these pedagogical strategies well beyond the current COVID-19 pandemic.

Course Design: Faculty reflections on course design suggest that the courses they teach should work in any format (instead of revising them when disruption occurs)—these reflections stem from the resilient pedagogy literature. Faculty spoke about the work involved and changes required when courses shift modality and suggested that the courses they teach can reach students, whether they have children, full-time jobs, or sick parents. All students, no matter their experience, receive the same educational outcomes. We suggest that these resilient pedagogical strategies are necessary for building a sense of belonging and a growth mindset for student success within and beyond the classroom. Dweck (2015) argues that a growth mindset does not presume that student assets, talents, or strengths are innate; rather, students through their strength, work ethic, grit, and resilience can build upon their existing strengths and develop new problem-solving strategies. When faculty diversify content, develop assignments that are flexible and accessible, and integrate student success within their courses, students can be successful and learn to develop new pathways to learn and be successful beyond just earning a grade.

Conclusion

While the current study brings to light valuable knowledge regarding faculty perceptions and experiences during the COVID-19 pandemic, several limitations should be noted. The sample was drawn from one public university in the Southeastern United States, and the results may not be generalized to a larger population. Furthermore, while we did not connect demographics such as race, age, and gender with qualitative responses, these data were gathered, and we know that the sample is homogeneous concerning race (predominantly white cisgender women). This is representative of the faculty population at the institution studied but we acknowledge and note that minority faculty members likely have unique experiences that are not necessarily reflected in this data. Future research should engage a larger, more diverse faculty sample to investigate these questions.

Second, the focus of this study was faculty perceptions and strategies, but the focus on faculty meant that the student's voice was not included here. Faculty do not make decisions about course

design and pedagogical strategies in a vacuum, but rather incorporate student feedback and experiences as they refine teaching practices. The current study does not consider how students reacted to the strategies that the faculty discussed. Future research should bring together student and faculty voices to elucidate a more holistic view of how these flexible and resilient pedagogical strategies work (or do not work).

Despite these limitations, the study provides a space to consider how negotiating the COVID-19 pandemic in all its disruptions required faculty members to reevaluate their pedagogical strategies, particularly when supporting undergraduate researchers. Utilizing qualitative survey data, this paper contributes to the existing and ever-growing body of scholarship on resilient pedagogy in higher education. We contend that resilient pedagogy is a best practice to foster and build student success and well-being beyond receiving a letter grade. The COVID-19 pandemic has provided an opportunity for faculty to reevaluate their pedagogical strategies, no matter the course modality or discipline, and learn new pedagogical methods, which have effectively, even if not named, reflected the essence and purpose of resilient pedagogy.

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