

**Experiences of Students with Autism in Online Postsecondary Education:
A Consensus Building Investigation Using the Nominal Group Technique**

Cailee M. Nelson¹, Susan W. White², Laura Stoppelbein²,

Margaret L. Paul³, Madelyn L. Armstrong¹ and Laura M. Morett¹

¹ Department of Educational Studies in Psychology, Research Methodology and Counseling, The University of Alabama, Tuscaloosa, AL USA

² Department of Psychology, The University of Alabama, Tuscaloosa, AL USA

³ Department of Psychology, Saint Louis University, St. Louis, MO USA

Author Note

Susan W. White: swwhite1@ua.edu

Laura Stoppelbein: lastoppelbein@ua.edu

Madelyn L. Armstrong: mlarmstrong2@crimson.ua.edu

Margaret L. Paul: margaret.paul@health.slu.edu

Laura M. Morett: lmoret@ua.edu

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Correspondence concerning this article should be addressed to Cailee M. Nelson, Department of Educational Studies in Psychology, Research Methodology, and Counseling, The University of Alabama, 520 Colonial Drive, Tuscaloosa, AL 35401. E-mail: cmnelson4@crimson.ua.edu

Abstract

Autism spectrum disorder (ASD) is a neurodevelopmental disorder that is often characterized in existing literature by deficits in social skills and communication. Due to COVID-19, a new issue has presented itself for many students—learning effectively in online education. Despite evidence suggesting many college students with autism prefer online courses, research specifically investigating the challenges these students face in emergency remote instruction is limited. Using a virtually adapted nominal group technique (NGT), this project examined the challenges students with and without autism face in emergency remote and hybrid postsecondary education and inquired about resources available to them. Themes such as struggling to form relationships, poor communication, and a need for increased accessibility emerged from the participants with ($n = 8$) and without ($n = 11$) autism. Ultimately, these findings highlight challenges that postsecondary students with and without autism are facing in emergency remote instruction and supports that would be helpful in these educational experiences.

**Experiences of Students with Autism in Online Postsecondary Education:
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Given that students with autism are enrolling in postsecondary educational institutions at a growing rate (White et al., 2019), it has become increasingly important to understand how postsecondary institutions can better support them in both in-person and online learning environments. As a result of the COVID-19 pandemic, the education of most postsecondary students, including students with autism, abruptly migrated from in-person to online (i.e., emergency remote instruction) or a combination of both (i.e., hybrid learning). The recent experiences of postsecondary students without autism in emergency remote instruction (ERI) highlight an absence of, and need for, online support services that may also apply to students with autism. For example, in ERI, postsecondary students without autism report dissatisfaction with the capacity to practice certain test-taking strategies (e.g., skipping difficult questions and returning to them later; McDaniel et al., 2020), decreased connections to peers, professors, and university communities (Gonzalez-Ramirez et al., 2021), and challenges in concentrating, managing time, motivation, and communication with faculty (Aguilera-Hermida, 2020). Additionally, postsecondary students without autism report a lack of academic (e.g., peer tutoring, study spaces) and non-academic (e.g., time and space for social interactions) support resources during emergency remote instruction (Aguilera-Hermida, 2020). However, it is unclear how postsecondary students with autism felt about the abrupt transition to ERI and if the resources that were reported as lacking by students without autism are also lacking for them. Given that evidence suggests that non-emergency online learning environments can be detrimental to both students with and without autism (Bettinger et al., 2017; Dumford & Miller, 2018), but also that individuals with autism often prefer online learning (Satterfield et al., 2015),

there is a need to understand what challenges are present in ERI and what resources could be provided to help ERI and possibly other online learning environments.

The Postsecondary Educational Environment for Students with ASD

Autism spectrum disorder (ASD), defined as a neurodevelopmental disorder, is characterized by deficits in social functioning and communication (American Psychiatric Association, 2013). Although accommodations and supports may increase the academic and social success of postsecondary students with autism (VanBergeijk et al., 2008), the deficit model is often inherent, ultimately placing the burden to be accommodated on recipients. For example, the College Autism Network (2017) lists resources such as classroom etiquette training and psychoeducational groups as supports that might be helpful in orientation to postsecondary education. Further, while some empirical evidence demonstrates a need for classroom modifications offered by faculty and administrative staff (e.g., breaking down large assignments, providing lecture notes, organizing course materials), the vast majority of research makes recommendations consistent with the deficit model (e.g., registering for disability services, attending counseling sessions to be taught how to handle social situations; VanBergeijk et al., 2008). Further, it has been demonstrated that young adults with autism struggle with skills associated with self-determination (e.g., independence; Elias & White, 2018), which could make self-advocating an even more difficult process.

Disability theorists and many self-advocates with autism claim that the deficit model of ASD is not helpful in advocating for or supporting postsecondary students with autism because it allows educational institutions to continue labeling them and their behavior as problematic rather than the institutions that serve them as such (McGuire, 2016). Although legislation (e.g., Section 504 of the Rehabilitation Act of 1973, Americans with Disabilities Act) has been enacted to

ensure that postsecondary educational institutions and workplaces do not discriminate based on disability status and attempt to minimize the burden on service recipients, it is unclear how successful universities are in providing services that students request, especially in ERI. For example, postsecondary students with autism attending in-person university classes report mixed feelings about support they receive from their educational institution. While some students with autism report satisfaction in the academic domain, several others report feeling underwhelmed by the support provided in the social domain (Cai & Richdale, 2016; Gelbar et al., 2015) and in academic adjacent domains (e.g., time management; Van Hees et al., 2015). Additionally, postsecondary students with autism report encountering an overall lack of understanding of ASD in support services available to all students (e.g., career centers, study abroad offices; Gelbar et al., 2015). This suggests that students with autism may take on a larger burden in self-advocating to succeed in higher education compared to students without autism (Clouder et al., 2020). Thus, absent or limited academic supports typically available to students with autism in many in-person postsecondary educational environments suggest that supports in online postsecondary education may be similarly absent or limited. This may be particularly true for ERI since, by definition, it required postsecondary institutions and its recipients to abruptly move online without any preparation.

In opposition to the deficit model of disability, or ASD more specifically, disability scholars emphasize a social model of disability in which a significant distinction is made between impairment and disability. This model proposes that the term impairment describes a state of body that is non-standard, whereas the term disability describes a disadvantage (Goering, 2015). Scholars who support the social model of disability suggest that it helps highlight that much of what disables individuals is associated with physical, social, and attitudinal institutional

norms that are alterable (Goering, 2015). Instead of asking students to immediately label themselves as disadvantaged to receive accommodations, the social model of disability demonstrates how universities might redesign educational environments to be more inclusive for all types of impairments (Goering, 2015). To adapt this model, especially in online learning, it is important to understand how students with disabilities feel about their postsecondary education and how this differs from the feelings of their peers without disabilities as it may highlight needs for accommodations that may have been previously missing.

Although many postsecondary students with autism report a preference for online learning (Satterfield et al., 2015), we do not know whether it is an academically or socially supportive environment for them more generally, especially in the case of ERI. Research indicates that attendance of in-person universities and colleges is commonly associated with negative outcomes in academic performance, social relationships, and mental health for postsecondary students with autism (Van Hees et al., 2015). In comparison, postsecondary students with and without autism opting into online learning express satisfaction with these environments and gain academic advantages from it (Adams et al., 2019). Indeed, postsecondary students with disabilities report several practical advantages of online learning, such as flexibility of work location and pace as well as avoidance of social pressures (Kotera et al., 2019), which could further explain the preference for online learning among postsecondary students with autism. However, barriers to success in online learning, including disorientation, inability to secure additional clarification of assignments and course tasks, and inefficient study habits, have been noted among postsecondary students with autism (Adams et al., 2019). Further, similar to reports from postsecondary students with autism attending in-person classes indicating loneliness, isolation, and bullying (Gelbar et al., 2014) and students without autism indicating

increased loneliness in ERI (Cairns et al., 2020), postsecondary students with autism attending traditional online programs often wish that their institutions offered additional virtual and/or in-person support services (e.g., academic and social clubs, online tutoring options, etc.) to better equip them for success and diminish feelings of isolation (Ludwig-Hardman & Dunlap, 2003).

The Current Study

While the evidence presented above demonstrates that there are challenges and missing resources in traditional online learning environments, there is very little research aimed at understanding the perspectives of students with autism in ERI and whether it has been more or less accommodating than in-person or hybrid instruction, particularly for students with little or no prior online learning experience or those who did not voluntarily elect online classes.

Therefore, the overarching goal of this study was to better understand the self-identified needs and challenges of postsecondary students with and without autism in online education. More specifically, the research team was interested in uncovering how the perspectives of students with and without autism differ in how they felt challenged and supported in ERI and how that may differ in comparison to in-person or hybrid classes.

The COVID-19 pandemic and the resulting shift to ERI afforded a unique opportunity to assess needs and challenges specific to online learning from a sample of students who experienced both in-person instruction and ERI. To address the research question, the current study implemented a virtually adapted nominal group technique (NGT) to examine the challenges that postsecondary students with autism faced in ERI in comparison to peers without autism and to investigate what resources were available and what resources postsecondary students with and without autism would like to see made available in online education. The NGT is typically used to obtain qualitative information in a procedural manner from target groups

closely associated with a common and significant issue (Van de Ven & Delbecq, 1972). In addition to its well-cited traditional benefits (e.g., limiting researcher and group influence, useful in exploratory settings), the NGT has proven useful in examining topics related to disability because it allows for equal involvement from all participants by obstructing domination of group discussion by certain participants and for participants to decide which issues require further discussion and which issues are the most important relevant to their shared experience (Lakhani et al., 2018; Olsen, 2019). Via the virtually adapted NGT, we anticipated that postsecondary students with autism experienced greater non-academic impediments and felt less supported both academically and non-academically than their peers without autism within ERI. Given the need for self-advocacy among postsecondary students with disabilities and known limitations related to self-determination ASD (White et al., 2021), as well as literature indicating increased social isolation and loneliness in relation to remote learning (Cairns et al., 2020) we also included measures of these constructs for descriptive purposes.

Method

Participants

Nineteen participants were recruited for the study. The 11 participants without autism were recruited from the same public university in the southeastern United States via a research participant pool where research credits were given as compensation for participating. The eight participants with autism were recruited via email from a registry of participants with autism managed by a research center and a university-based support program for students with autism. The sample with autism was compensated with gift cards. All participants with autism were enrolled in public universities varying in location across the United States. To be included, participants were required to be 18-25 years old, enrolled in some form of postsecondary

education (e.g., community college, university), working toward a degree, and have taken at least two courses virtually (emergency remote and/or non-emergency online course) at some time between January 1, 2020 and August 30, 2020. In addition, participants with autism self-reported their ASD diagnosis.

Both the groups with and without autism were divided into smaller groups of two to four for NGT sessions based on a first-come, first-serve basis. A total of six interview sessions (three with participants with autism, three with participants without autism) were conducted. All participants provided written consent prior to participation and the study was approved by the host university's institutional review board.

Materials

Within interview sessions, participants completed a series of online questionnaires via REDCap (Harris et al., 2019).

Demographic Questionnaire

The demographic questionnaire consisted of 29 multiple choice and open-ended items. Although demographic information on gender, race, and ethnicity was collected, no information about socioeconomic status was collected. In addition, information regarding participants' postsecondary institution, disability services received, and mental health status was collected.

The UCLA 3-Item Loneliness Scale

Given that postsecondary students with autism experience loneliness more often compared to students without autism (Gelbar et al., 2014) and that reports of increased loneliness in ERI have been made (Cairns et al., 2020), the UCLA 3-Item Loneliness Scale (Cronbach's $\alpha = 0.72$; Hughes et al., 2004) was administered to better understand individual differences in loneliness among participants. This survey consisted of three items in which participants

indicated how often they experience subjective feelings of loneliness on a 3-point Likert scale (1 = Hardly Ever; 2 = Sometimes; 3 = Often). Loneliness scores were calculated by summing participants' scores for each item.

American Institute for Research (AIR) Self-Determination Scale

As it has been demonstrated that young adults with autism struggle with skills associated with self-determination (e.g., independence; Elias & White, 2018), ASD severity predicts self-determination (White et al., 2021), and self-determination is an important skill for achieving goals (e.g., succeeding in college courses, self-advocating; Sheldon, 2014), the AIR Self-Determination Scale (Cronbach's $\alpha = 0.93$; Wolman et al., 1994) was used to elucidate individual differences in how participants obtain what they want and need. This questionnaire consists of four subsections, each comprising six items, related to the following categories: things I do, how I feel, what happens at school, and what happens at home. Each item was rated based on how often participants felt similar to it during the past seven days (1 = Never; 5 = Always). Capacity for self-determination was calculated by summing participants' scores for each item in the "Things I Do" and "How I Feel" sections. Opportunity for self-determination was calculated by summing participants' scores for each item in the "What Happens At School" and "What Happens At Home" sections. Total self-determination was then calculated by summing participants' capacity and opportunity scores.

Procedure

Upon contact with participants, a member of the research team described the purpose and procedure of the study in detail and ensured they met inclusion criteria. Participants were then asked to create an alias by which they would be called for the remainder of their participation to maintain confidentiality.

Once enough participants were recruited for each session, NGT sessions began. All NGT sessions were conducted virtually via the Zoom video conferencing platform. NGT sessions were virtually adapted in the following ways. First, as traditional NGT sessions use whiteboards to record discussion points and categorizations (McMillan et al., 2014), the virtual NGT session utilized screen sharing to convey discussion points and categorizations to all participants. Second, typical NGT sessions ask participants to anonymously rank top ideas on paper slips that are given to the research team for tabulation (McMillan et al., 2014). In the virtual NGT session, participants were asked to anonymously rank top ideas via a poll. Other than these adaptations, NGT procedures were not changed. Each NGT session was led by one research team member and observed silently by two others to help with note taking and management of technological issues. In each NGT session, participants were made aware of the research team members' presence and were reminded that the session would be recorded for subsequent data analysis. Videos of NGT sessions were recorded and archived on a HIPAA-compliant cloud storage server for later analysis.

At the beginning of the NGT session, the facilitating research team member led group introductions and reminded participants of the purpose of the study. The sessions followed a structured format consisting of the following steps: silent generation, presentation of ideas, clarification, and voting. Once these steps were completed for the first question, a 20-minute break was given to participants to complete surveys and rest. After the break, the same steps were completed for the second question. Specific procedures for each step are described below.

Silent Generation

After each question, participants were given time to write down their responses to the question posed. Questions were phrased as follows: (1) "What are the relative (or different)

challenges associated with in-person and online instruction in college?"; (2) "What supports would help you be successful in college with virtual or hybrid instruction?". These questions included aspects of both in-person and online instruction as we were interested in understanding how experiences and support services differed among all learning formats both before and during the pandemic. The facilitator explained that participants would have about five minutes to write down their ideas for the question and then would return to the group to present those ideas.

Presentation of Ideas

This step was used to allow each participant time to present the ideas they had written down. Presentation of ideas was conducted round robin style until all participants presented every idea they had. As participants presented their ideas, another research member recorded each idea in a document visible to all participants via screen sharing. Concurrently, a separate research team member categorized ideas in a non-shared document presented in the next round.

Clarification

Upon completion of the presentation of ideas, the research team member responsible for categorizing ideas screen-shared their categorization for all participants to see. This step was used to ensure that participants, as a group, understood the categories created by the research team. In addition, this step aimed to clarify which participants' ideas fit under each category. The facilitator explained the categories and asked participants if they agreed with them, and if so, to attend to categorization of ideas. The facilitator then focused on each idea and asked participants if they agreed with its categorization. If participants did not agree with the categorization of an idea, the facilitator initiated a discussion to correctly categorize the idea. Group consensus was obtained for each idea and category before moving on to the next step.

Voting

Once participants agreed with the categorization of ideas, they were asked to individually rank how well each category answered the original question. The purpose of this step was to better understand how important participants found each category for the question posed. The facilitator emphasized that each category could only receive one ranking. As the facilitator created the poll, participants were asked to write down their rankings on a piece of paper to facilitate correct ranking of the categories. Once the participants and facilitator finished, the poll was made available so that participants could vote. Upon completion, the facilitator presented the ranked results to the group.

Data Analysis

Because sample sizes varied between the groups with and without autism, questionnaire data were analyzed using Welch's *t*-tests. To analyze the qualitative data, two main approaches were used, following the NGT procedures in Denning et al. (2012) and McMillan et al. (2014). First, for both questions posed, individual rankings of categories were collated within each individual NGT session to create summed session rankings for each category. Second, each NGT session was transcribed and qualitatively analyzed to determine similarities in emergent themes across all sessions (i.e., similarities in responses from participants with and without autism).

Scoring of Group Rankings of Themes

To better understand the rankings for each category within an NGT session, scores were assigned to each individual's ranking based on the number of categories generated in each session (i.e., if there were 5 categories, any category that was individually ranked as the most challenging issue or most helpful support would receive a score of 5). A total session score was then created for each category by summing the individual rankings for that category for both questions in every session.

Qualitative Content Analysis

Qualitative themes were identified in the data through two rounds of coding conducted by three research team members. The first round of coding for each interview utilized the categories generated by participants in each session as the codes for statements participants made. As language used by participants within each individual NGT session among the diagnostic group was not exactly the same, a second round of coding was conducted to produce more cohesive themes across the groups with and without autism. In this second round of coding, the research team jointly created more general codes by collating first-round categories based on socially typical patterns across sessions and then re-classifying responses based on these broader and more general codes. To ensure inter-rater reliability among the three raters, Fleiss' kappa was calculated for both rounds of coding. Agreement for all NGT sessions was greater than 0.81 for the first round and 0.75 for the second round, demonstrating strong inter-rater reliability.

Results

Participant Characteristics

Table 1 provides an overview of demographic data for participants. Mean age for the participants with autism ($M = 21.75$, $SD = 2.76$) and participants without autism ($M = 20.82$, $SD = 1.89$) did not differ significantly, $t(11.62) = 0.824$, $p = 0.43$. GPA among participants with autism ($M = 3.59$, $SD = 0.46$) and without autism ($M = 3.23$, $SD = 0.48$) also did not differ significantly, $t(15.46) = 1.616$, $p = 0.13$. Both groups were largely in their third year of undergraduate education at the time of the interview (participants with autism: 37.5%, without autism: 54.5%). For both groups, most participants resided off-campus during the academic year (participants with autism: 62.5%, without autism: 54.5%). Although both groups reported using

disability services (e.g., extended test time, note taker, text-to-speech) in some capacity within higher education, 62.5 % of the group with autism reported currently using these services in comparison to 0.09% of the group without autism. The group with autism reported significantly greater loneliness than the group without autism (see Table 2). In addition, the group with autism reported significantly less capacity for, opportunities to practice, and total self-determination than the group without autism (see Table 2).

Group Rankings

Question 1: The Biggest Challenges in Online and In-Person Classes

Overall, both groups varied in their identification of the greatest challenge (see Figure 1). For example, participants with autism reported distractions and engagement and communication and understanding as their biggest challenges in ERI. In comparison, participants without autism reported lack of connections and communication and difficulty in learning as their biggest challenges in ERI.

Question 2: The Best Supports to Be Successful in Virtual or Hybrid Learning

Rankings for the second question also varied across groups (see Figure 2). Participants with autism reported consistent announcements as well as communication and accessibility resources as the supports that would be most helpful in their online and hybrid courses. Participants without autism believed an increase in meetings and virtual study rooms as well as professor support and availability had the potential to offer the greatest support.

Emergent Themes

Question 1: The Biggest Challenges in Online and In-Person Classes

Distractions and Engagement. Overall, both participants with and without autism talked about distractions as a major concern and challenge for their college experience. However, one

striking difference between their responses was that participants with autism discussed their ability to stay engaged in online course material as part of being distracted, particularly when observing how their peers maintained engagement. In comparison, participants without autism, when discussing distractions in their online courses, did not mention engagement or other classmates' influence. Instead, they discussed distractions in their online classroom as elements that they felt they had some control over (e.g., temptation to open other tabs on their browser, check their phone, or lie in bed).

Another notable difference between participants with and without autism in their discussion of distractions was that participants with autism found in-person classes to be as, if not more, distracting than ERI. In addition to participants with autism stating that campus can be overstimulating, one such participant discussed how group work became easier in the online transition because of fewer distractions. They said,

This [group work] is one of the things that actually got better when I went online because you could go into different breakout rooms on Zoom and not have to hear other people, but when we were in person, it became incredibly distracting and overwhelming to be hearing a bunch of different groups' conversations at once when we were all stood up. And there was one point where I had to leave the room because it became so jarring just to try to concentrate on the person sitting in front of me. Like, it's already hard enough to keep up with three different people who might have different ideas to contribute inside the group when you had multiple sets of these conversations going on at once; it was chaos to try to come up with any of it.

Although participants both with and without autism considered distractions to be a significant challenge in their college courses, they reported experiencing distractions in different ways. Specifically, participants with autism suggest that ERI might have some benefits in limiting distractions that are problematic for them in in person classes. This demonstrates a need for universities to better understand perspectives from students with diverse learning needs to help design classes that are more accommodating.

Technology and Classroom Setting. In general, both participants with and without autism discussed technology and the learning environment as challenges in their online courses. However, while participants without autism were in consensus that online classes were worse and caused more problems than in-person classes, participants with autism had mixed opinions. For example, participants without autism reported the lack of group work, poor internet connections, and headaches from too much screen time as major challenges they faced online. Although participants with autism shared similar challenges, they reported benefits of technology for their online coursework. For example, one participant with autism said,

I would say that, along the lines of having recordings and things, it's a lot easier to make up classes for whatever reason, and I think it makes it more accessible, at least physically, when you can go to the living room instead of having to actually go to campus.

Thus, despite widespread issues with technology and virtual learning environments, some aspects of ERI made learning more accessible for participants with autism. Therefore, these technological accommodations might be important for universities to consider when designing in-person courses as well.

Communication, Socialization, and Forming Relationships. Both participants with and without autism discussed challenges with communication, socialization, and forming relationships in their online courses. Interestingly, all participants indicated that this was a challenge both in ERI and non-emergency online instruction. Participants without autism largely discussed difficulties in asking questions during pre-recorded lectures and online exams, receiving communication from professors in a timely manner, and forming relationships with professors and classmates.

Although the majority of participants with autism discussed challenges similar to those reported above, one participant discussed these challenges in connection to disability and their own mental health. For example, they said,

...when I'm in in-person classes, it's a lot easier to kind of voice your opinion about if certain rhetoric is being—maybe this is hyper-specific—but if certain rhetoric is being used that I think is ableist or is not super great. It's kind of hard to shut that down virtually when you can't see anybody or when, you know, it's just you talking, because it doesn't feel like it'll change the atmosphere. So, I guess on a broader scale, I don't like to talk because I don't think anybody's listening, especially when I can't see anybody.

In discussing the impact of this further, they said,

...I find that in classes where everybody has their screens off. I just feel a little bit more anxiety because I cannot read how people react to—I feel like I'm the only one reacting the way that I am, or if I do say something, I can't see how everybody else reacts to it. I get anxious about if I said something wrong, if that makes sense, because usually, if you're in a small classroom or even a lecture hall, you can see people nodding, which you could see virtually, but it's just not the reality. You could see people nodding or you could see them audibly or you could audibly hear like, “hmm” like, but that's just not a thing.

As made apparent by this dialogue, difficulties with discussion and communication in ERI can be distressing to certain students with autism and impact their mental health on a larger scale—especially when the ERI is implemented more similarly to traditional online instruction rather than in-person instruction. As participants without autism discussed difficulties with forming relationships in traditional online courses as well, this might be an area that needs to be transformed across all online learning platforms.

Learning Difficulties. Although only one participant with autism discussed learning difficulties as a major challenge in online learning, both groups described them in the same way. For the most part, both groups claimed learning online was not the same as learning in person. Additionally, participants without autism clarified this difficulty was present in both ERI and non-emergency online instruction. For example, one participant without autism claimed that

math was more difficult to understand online in general, while another claimed that having to adjust to COVID protocols made learning difficult for everyone. In addition, participants without autism argued that managing assignments and homework was more challenging online than in-person. Similarly, the participant with autism said,

For online, not being able to fully learn the topics because if you're not [in] a Zoom class, you're doing it on your own, and I know one of my classes right now that's fully online, we're just given a book and that's it. There's no, like, lectures or, like, PowerPoints to follow or anything. It's kind of hard to learn that way.

Thus, it may be the case that students in all types of online classes sometimes fail to receive the proper material, quality of education, or guidance for managing course work that they do in in-person classes.

Resources and Accommodations. Only participants with autism discussed resources and accommodations as a major challenge. In general, participants reported difficulties requesting accommodations online. For example, in discussion of all online work, one participant said,

I found that trying to request and work with professors on disability accommodations is a lot more difficult online, especially with the lag that I was talking about. Because if you don't get a response before whatever exam or time that you need an accommodation, then it can be difficult to try and get those set up versus in person where you can go actually just talk.

In addition, another participant described a time when a professor simply ignored an accommodation request during ERI. They said,

But it [another participant's response] caused me to think of a time when my professor didn't really follow the accommodations to give me a bit [of] extra time. Because she's, like, it's online. You have so much time, etc., etc.

From these two examples, it is clear that requesting accommodations online may be a difficult process. In addition, faculty may believe that online classes are accessible enough and refuse to provide accommodations.

Question 2: The Best Supports to Be Successful in Virtual or Hybrid Learning

Improved Communication. As both groups mentioned communication as a major challenge, it follows that a major support discussed among both participants with and without autism was improved communication. Discussion of improved communication mainly revolved around professors clearly communicating course expectations and promptly responding to emailed questions. For example, participants with and without autism noted that it would be really helpful if professors communicated days and hours when they answer emails. Despite most responses following this one closely, one participant with autism mentioned that they desired professors who are understanding and know how difficult online learning, especially ERI, can be for students. Taken together, it seems that all students desire more consistent and frequent communication from professors in online and hybrid classes as well as communication aimed at understanding each student's situation and helping them succeed in the course.

Change in Classroom Structure and Design. Interestingly, both participants with and without autism held very similar discussions regarding virtual and hybrid learning environments that recognized that these classes cannot and should not be structured in the same way as in-person classes. For example, participants mentioned that online classes should include one-on-one Zoom meetings with advisors or professors to ensure students are understanding course material. Participants also discussed how it would be helpful if an online space were available for students to get together and study for their courses. Additionally, participants spoke about flexibility concerning assignments. More specifically, they mentioned adding more group assignments to lessen workload, creating a more specific syllabus and course schedule at the beginning of the semester, and allowing for more flexibility concerning deadlines. Finally, participants spoke about drastically changing the nature of online and hybrid courses. For example, one participant without autism discussed removing the hybrid option altogether

because it is difficult to attend class in-person on some days and virtually on other days.

Participants with autism suggested shortening classes or incorporating more scheduled breaks to reduce the amount of time spent online. For example, one participant with autism stated,

So, this might be kind of radical, but I think it could solve a lot of other issues. So, I have a professor right now who, we're in person, but he doesn't have use of a whiteboard because of the space that we're in. But he's keeping all of his lecture materials, the same amount of lecture that he would if he had a whiteboard, so our classes are about 20 minutes long, but he prefaces it with, I'm not going to give you more because that's not fair. Whereas a lot of other professors because they're online, just do a ton of information, which is way more than they would be able to do in person. So, my support that I think would help success is that all classes be 50 minutes, like classes that are three hours long over Zoom, because—or even an hour and 15 minutes—because professors are taking advantage of it and just overwhelming us with information because they can get through it faster. Because they're not having to write on a board, you can put everything in slides and then go through 100 slides in an hour, which is just—in my opinion, it's just ridiculous.

Thus, many students expressed dissatisfaction with ERI and hybrid instruction. Given the dissatisfaction, universities may want to consider encouraging instructors to limit the amount of material presented in one online session or implement more interactive instruction. Additionally, a more consistent format (e.g., in-person or online) might be helpful in getting students to show up to class. Despite individuals with autism suggesting that ERI is less distracting than in-person classes, it seems that there are still areas where the online learning environment can be improved.

Increased Accessibility of Resources. Most of the discussion surrounding increased accessibility of resources occurred among participants with autism. However, several participants without autism stated that access to free tutoring for more academic subjects would be helpful in their virtual and hybrid learning experiences. Despite participants with autism suggesting that online learning provides technological advantages (e.g., recorded lectures), they still believe that accessibility in virtual and hybrid courses can be improved. Among participants with autism, supports that fell under increased accessibility of resources ranged from video

captioning and professor training to increased mental health support. Indeed, most participants with autism felt that video recordings with captions and lecture transcriptions should be required for virtual and hybrid classes. Additionally, a participant with autism believed that most professors are not aware of the sensory sensitivities (e.g., flashing lights, loud noises) of some students and that broad training on this topic would increase accessibility in online and hybrid classes. Finally, in discussing mental health support, one participant with autism said that better access to such resources would be helpful and that it was a deeper, structural issue that may align with the deficit model of disability. It is important to highlight that although most of the discussion concerning accessibility of resources came from participants with autism, participants without autism also demonstrated a desire for it. As such, this may be an important topic for consideration in structuring online and hybrid classes.

Mentorship and Support/Accountability. While all participants discussed support groups to some degree, they differed significantly in their description of such groups. The main type of support group that participants without autism thought would be helpful in online and hybrid learning was accountability-oriented and included peers, professors, friends, and family. In contrast, participants with autism spoke about support groups serving more of a mentorship role. For example, one participant with autism said:

...it would be helpful to have some mentors that can teach students with autism and stuff various skills to be able... Well, maybe not just students with autism but people in general to mentor and teach others how to thrive in online classes. Because when I had the support of mentors in college, they were able to help me adjust to being able to better manage my time and my energy, and so that's how I managed to thrive in spite of the difficulties.

Another participant with autism agreed with this statement and spoke of a program implemented at their university to help neurodiverse students. Thus, in-person mentorship

programs at some universities can serve as models that can be adapted for online learning, helping to prepare all students for success regardless of modality of instruction.

Discussion

Online education has been commonplace in postsecondary education and is likely to be a mainstay in years to come. It is unclear if qualities of ERI (e.g., video conferencing) will be adapted for online learning or if ERI will need to be used again. Therefore, it is important to understand how it impacted students with and without autism. To do so, we explored self-identified challenges and effective supports experienced by students with and without autism to help educators and institutions better understand the perspectives of the growing number of postsecondary students with autism. In doing so, we posed two questions to participants with and without autism that aimed to generate discussion surrounding common struggles in ERI and in-person postsecondary classes and highlight the need for services in virtual and hybrid courses. It should be noted, however, that these questions may have been too broad, as evidenced by discussion covering topics related to non-emergency online courses as well. Future research may therefore benefit from narrower questions revealing the nuances between experiences with these types of courses.

There were commonalities with respect to perceived challenges between students with and without autism. For instance, both groups identified communication problems within the top three ranked challenges. The most challenging issue identified by students with autism was distraction during class, which was also a highly ranked challenge for students without autism. The nature of the challenge seems to differ between groups, however; whereas students with autism described getting distracted by other students and sensory stimuli, students without autism remarked on approach-based distractions (i.e., wanting to do something else). Other

challenges identified include technology failures or glitches and communication problems. Regarding the latter, it seems that both students with and without autism miss out on socialization in ERI. This is in line with recent research investigating the effect of ERI on postsecondary students without autism suggesting that remote learning changes the way relationships are formed (Cairns et al., 2020) and leads to decreased connections to peers, professors, and university communities (Gonzalez-Ramirez et al., 2021). However, given that participants with autism rated themselves as significantly lonelier in this study, the loss of socialization online might be more challenging to students with autism.

Finally, despite students with autism describing advantages to ERI compared to in-person classes, they also reported experiencing loss of supports, resources, and accommodations when moving to online education. With respect to supports that have been or would be helpful in ERI learning, here too, there were similarities across students with and without autism. Clear, transparent communication from instructors was ranked highly, especially for students with autism. This finding aligns with research investigating traditional online experiences indicating that postsecondary students with autism report interactions with professors as important but still struggle to remain consistently in contact (Adams et al., 2019). Restructuring online courses (e.g., by integrating comprehension checks) was generally agreed upon as a helpful strategy. Accessibility of resources was discussed by students with and without autism, though with different foci. Whereas students without autism suggested more supports for academic learning, for students with autism, accessibility supports were more related to the instructor's accommodation of ASD-related needs (e.g., sensory issues). Similarly, with respect to support groups, students with autism indicated that peer-to-peer mentoring on success in online learning would be helpful, whereas students without autism commented on a need for externally imposed

accountability, similar to coaching. Indeed, a brief peer-to-peer mentoring program implemented during ERI for students without autism was demonstrated to be helpful in maintaining GPA and developing connections to others (Krause & Moore, 2021). As in-person peer-to-peer mentoring has also been helpful in improving academic outcomes, motivation, and social relationships for postsecondary students with autism (Siew et al., 2017), a similar program implemented online may help accommodate all students.

Taken together, postsecondary educational institutions may need to consider adding to the existing support structure in a way that is more consistent with the social model of disability. This is further evidenced by responses made by participants with autism suggesting that the loss of supports may be a deeper, structural issue. While the accommodation process must continue to follow existing legislation and could not have possibly been adapted seamlessly to ERI, postsecondary educational institutions in agreement with the social model of disability (Goering, 2015) and the results of this study might consider including individuals with a wide range of impairments in the design of future online support services (e.g., clubs, resource pages, seminars for academic adjacent topics).

This study is not without its limitations, foremost of which is the small sample and resultant limitations to generalizability of findings. All of the students without autism, moreover, came from a single university, reflecting a homogeneous educational experience. It is possible that with a larger, more diverse sample, more themes would have emerged. Related to this, it is noteworthy that participants with autism were mostly female, which is unusual based on the diagnostic gender ratio (Loomes et al., 2017) and may also limit the generalizability of the findings. Additionally, it would have been ideal to have in-study diagnostic confirmation. This was not possible due to distancing mandates during the COVID-19 pandemic.

As the NGT is a consensus method that aims to achieve convergence of opinion on a given topic, it would have been ideal to have one session with all of the participants in each diagnostic group to help develop a true consensus. This was not possible in the current study due to scheduling constraints but should be pursued in future research. Similarly, because the second round of coding of NGT sessions involved collating participant-determined categories via socially typical patterns of responses, biases in the development of new categories may have been present. Having one session with all participants in each diagnostic group may have helped reduce any biases, as well. Finally, with respect to student-identified challenges, it is impossible to disambiguate the degree to which they are inherent to non-emergency online learning versus ERI as we did not ask participants to indicate the number of online courses they had taken within each format. In ERI, universities, instructors, and students had to quickly pivot with almost no time to plan, and the challenges these participants faced might be unique to this type of instruction. Nevertheless, some students made comments about experiencing challenges during non-emergency online classes; thus, we believe there might be some generalizability of certain challenges and resources, and future research could help tease out nuanced differences between the two.

These limitations notwithstanding, this is the first consensus-building study to identify challenges and supports experienced by postsecondary students with autism in relation to ERI. Our hope is that the findings will spur more research in this area and ultimately facilitate optimization of online postsecondary education, particularly for students with autism.

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Table 1*Sample Demographics by Diagnostic Group*

Demographic Variable	ASD (<i>n</i> =8)	TD (<i>n</i> = 11)
	Percentage	Percentage
Birth Gender		
Female	87.5	100
Male	12.5	-
Current Gender		
Female	75	100
Male	12.5	-
Other	12.5	-
Sexual Orientation		
Heterosexual	50	100
Homosexual	25	-
Bisexual	12.5	-
Asexual	12.5	-
Ethnicity		
Non-Hispanic or Latino	100	90.9
Not Indicated	-	9.1
Race		
White	75	72.7
Black	12.5	18.2
Asian	12.5	-
Two or More Races	-	9.1
Current Living Situation		
Living with Roommates	25	72.7
Living with Parents/Family	50	18.2
Living with Partner/Spouse	25	9.1
Currently Employed		
Unemployed	62.5	36.4
Part-Time	37.5	36.4
Full-Time		27.2
Currently Enrolled in a Degree Seeking Program		
Yes	87.5	100
Residence When Not Enrolled in Classes		
Off Campus Local	62.5	72.7
Off Campus Non-Local	37.5	27.3
Employment Status When Enrolled in Classes		
Unemployed	50	36.4
Part-Time	50	36.4
Full-Time	-	27.2
Received Disability Services in Past		
Yes	87.5	18.2
Difficulty Concentrating		
Yes	87.5	36.4
Received Mental Health or Psychiatric Services in Past		
Yes	100	9.1
Currently Receiving Mental Health or Psychiatric Services		
Yes	75	9.1

Table 2*Mean Loneliness and Self-Determination Scores with Welch's t-Test Results*

Survey Measure	Mean(SD)	<i>t</i>	df	<i>p</i>
Loneliness		2.431	12.05	0.03
ASD	6.38(2.0)			
TD	4.36(1.43)			
Self-Determination – Total		-2.626	12.69	0.02
ASD	79.38(17.30)			
TD	98.70(12.94)			
Self-Determination – Opportunity		-2.540	12.11	0.03
ASD	40.12(10.08)			
TD	50.80(7.05)			
Self-Determination – Capacity		-2.470	13.38	0.03
ASD	39.25(8.03)			
TD	47.9(6.49)			

Figure Legend

Figure 1. *Question One Session Rankings of Categories by Diagnostic Group “What are the relative (or different) challenges associated with in-person and online instruction in college?”*

Figure 2. *Question Two Session Rankings of Categories by Diagnostic Group*

“What supports would help you be successful in college, with virtual or hybrid instruction?”

ONLINE LEARNING IN AUTISM

Figure 1

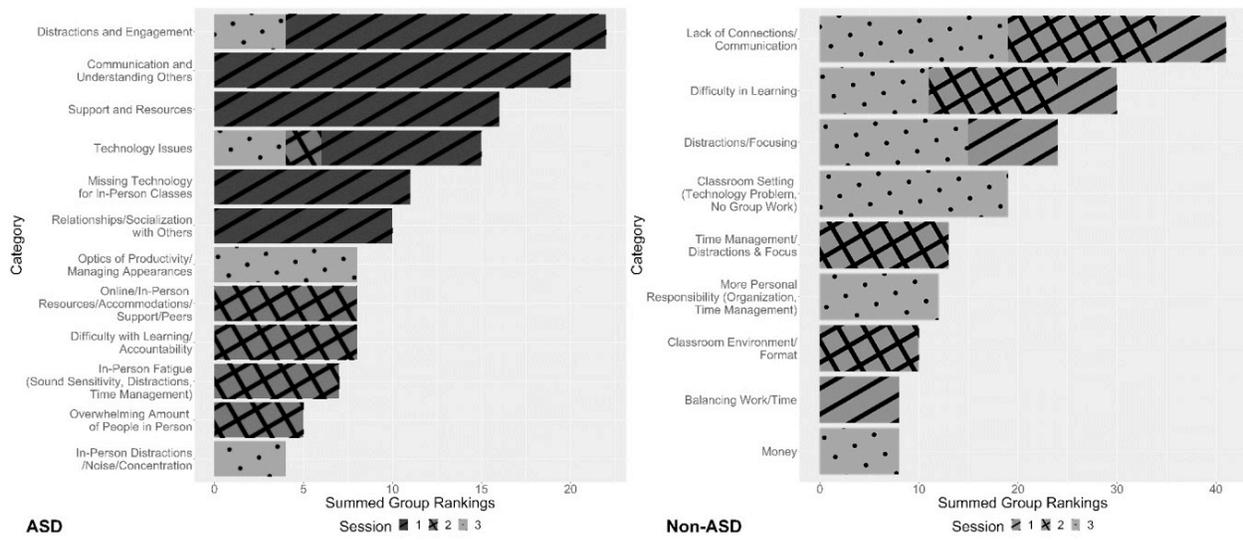


Figure 2

