

## ARTICLE

# Promoting Scientific Exchange and Student Training Through Scientific Meetings; Insights from a Joint Virtual Undergraduate Neuroscience Conference During the COVID-19 Pandemic

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Participation in scientific conferences is a fundamental part of neuroscience and student training. Many conference opportunities have been cancelled, limited, or changed in response to the COVID-19 pandemic. This paper is a conference report from a joint virtual 2021 meeting of two regional undergraduate neuroscience conferences, the Midwest/Great Lakes Undergraduate Research Symposium in Neuroscience (mGluRs) and the Midwest Regional Neuroscience Conference (MidBrains). We discuss our conference planning logistics, benefits and challenges of the

virtual conference format, student feedback on the virtual meeting, additional benefits of a joint meeting, and “take home” messages and considerations for future conferences. We hope insights from our experience can benefit future conference organizers in planning scientific conferences, both for in-person and virtual settings.

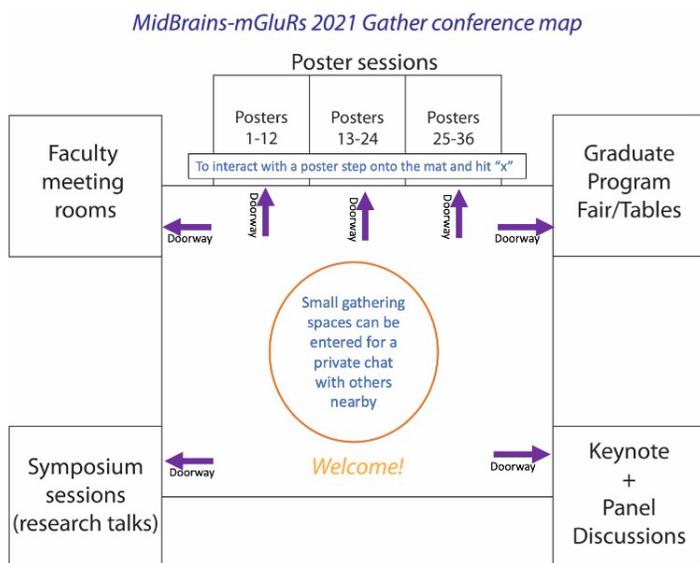
*Keywords: Undergraduate Education; Conference Organizing; Virtual; Professional Development*

There is demonstrated value and importance for undergraduate students to present research findings in a conference setting (Mabrouk, 2009; Potter et al., 2010; Helm and Bailey, 2013; Kneale et al., 2016; Little, 2020). At the individual level, giving a final research presentation is significantly and positively correlated with a student’s overall research experience (Lopatto, 2007). Presenting research helps to develop scientific communication skills (Weston and Laursen, 2015) and is directly associated with personal-professional gains in increasing students’ confidence and sense of identity as scientists (Hunter et al., 2007). Presenting research findings is also a measure in major assessments of undergraduate research experiences, including the widely used Survey of Undergraduate Research Experiences (SURE) as well as the Undergraduate Research Student Self-Assessment (URSSA) required for all NSF BIO REU programs (Lopatto, 2007; Weston and Laursen 2015).

A variety of conference settings give undergraduate students opportunities to share their research, from campus research days to international meetings (e.g., Society for Neuroscience (SfN) Annual Meeting and Faculty for Undergraduate Neuroscience (FUN) undergraduate poster session at SfN). In neuroscience, there are several regional conferences that provide opportunities for undergraduates to present their research, including the Midwest/Great Lakes Undergraduate Research Symposium in Neuroscience ([mGluRs](#)), the Midwest Regional Neuroscience Conference ([MidBrains](#)), the Symposium for Young Neuroscientists and Professors of the SouthEast ([SYNAPSE](#)), the NorthEast Undergraduate Research Organization for Neuroscience ([NEURON](#)), and [SfN chapter conferences](#). Since 2019, many of these opportunities have been cancelled, limited, or changed in response to the COVID-19 pandemic.

This paper is a conference report from a joint virtual meeting of mGluRs and MidBrains to help inform planning and participation in future undergraduate conference opportunities, both virtually and in-person. In the fall of 2021, both MidBrains and mGluRs were planning to hold in-person, regional undergraduate neuroscience conferences at the University of Wisconsin Eau Claire (UWEC) and the College of Wooster, respectively. However, as the COVID pandemic continued to disrupt travel and large group in-person gatherings, both groups began to consider a virtual meeting. Given the recognized value of student participation and presentation at conferences, and the lack of many such opportunities during the COVID-19 pandemic, we were committed to providing an excellent, synchronous conference experience for undergraduate students. Since both conferences are typically held in the fall semester and the organizers were colleagues, we began plans for a joint virtual conference.

The traditional format of the MidBrains and mGluRs conferences was similar: both conferences included undergraduate research poster sessions, a keynote address from an established principal investigator, a graduate school question and answer panel, and graduate school sponsorships and recruiting. In addition, mGluRs typically hosted a career panel with alumni, and MidBrains contained short research talks by the graduate school sponsors. Therefore, drawing these two conferences into one virtual meeting did not require major changes to their traditional schedules but did require careful planning to promote student engagement in the virtual format. Planning the virtual meeting involved similar timing and milestones to an in-person meeting (e.g., months in advance = scheduling speakers and events; weeks in advance = abstract submission and conference registration deadlines, creating



**Figure 1.** Schematic of 2021 MidBrains-mGluRs virtual conference spaces. This map of virtual conference space was shared with participants; each component was created in a separate virtual room. A central Welcome room was created that served as an initial starting point from which individuals navigated into breakout rooms designed for each component of the conference. For example, poster sessions were held in smaller rooms that could be accessed by walking through virtual doorways in the top section of the Welcome room, while the room used for the Keynote Speaker could be accessed by walking through a doorway on the bottom right side of the Welcome room. The size and components in each room were customized based on the number of participants expected for each activity based on platform recommendations.

conference booklet; Arcila Hernández et al., 2022).

Our meeting benefited from the efforts of colleagues who previously hosted a virtual meeting during the pandemic. In fall 2020, colleagues from Augustana College hosted MidBrains as a virtual meeting due to COVID restrictions. They successfully drew together 27 undergraduate research posters, hosted a keynote, and continued the graduate panel and recruiting opportunities (<https://www.midbrains.org/past-meetings/2020-meeting-with-augustana/>). The faculty organizers of this conference generously shared templates and budgeting materials to inform our planning. In addition, in the summer of 2021, FUN hosted the Neuroscience Undergraduate Research Virtual Symposium (<https://www.funfaculty.org/NURVS>) because the annual Society for Neuroscience meeting, and therefore the FUN poster session, had been canceled in 2020. Therefore, we had experience participating in virtual meetings, examples of virtual conference elements, and colleagues to work with that could help us be successful in hosting our own virtual conference.

### Creating a Joint Virtual Conference: MidBrains-mGluRs 2021 Meeting Logistics

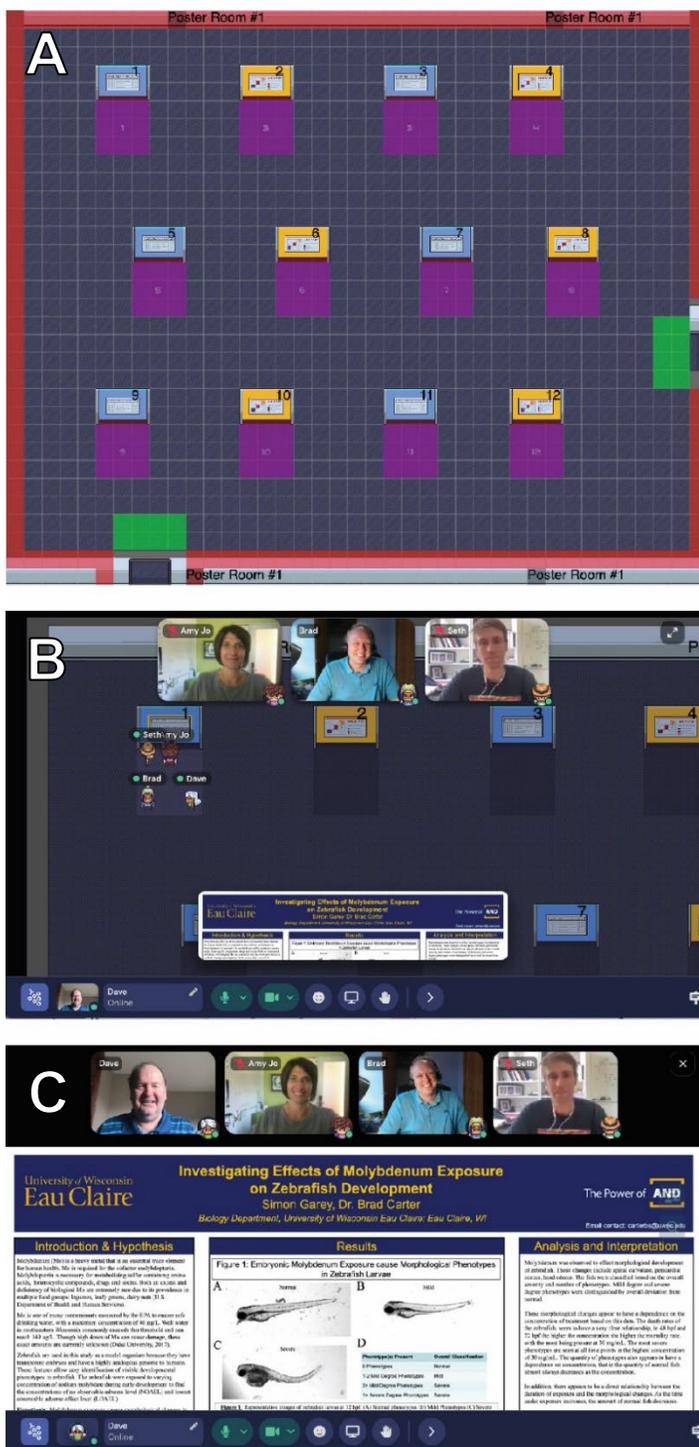
We wanted to structure the virtual conference around promoting synchronous community and scientific exchange. As we reflected on our own experiences with conferences, we sought a virtual platform that would allow us to maintain the essential components of the conference and promote

interactions among attendees. During the COVID pandemic, many conferences shifted to virtual formats, and we were exposed to a variety of platforms, such as Zoom, Gather, and Remo. Based on colleague recommendations and personal experience, we selected Gather ([gather.town](https://gather.town)) because it creates a virtual conference hall that individual avatars can navigate like an in-person conference. The 2021 MidBrains/mGluRs conference Gather meeting space is diagrammed in Figure 1.

The Gather platform also enabled real-time, synchronous interactions between conference participants like those of an in-person conference setting. When avatars are near each other in Gather, they enter a private, real-time video space where all participants show up in a live video/audio feed as an overlay at the top of the Gather screen. This interactive component made virtual interactions more conversational, which was particularly helpful for poster presentations. The presenter could talk with a small group of audience members, much like an in-person poster presentation, and because all members in the private video space could interact, a back-and-forth dialogue could take place (Figure 2). This format was also a benefit at the graduate school recruitment tables. As students approached each table, a live video feed began, and the graduate school representative could talk directly with interested students. In all instances, when participants wanted to explore other opportunities, they simply moved their avatar away, allowing simple ways for participants to begin and end interactions. The platform also allows for virtual microphone stands that broadcast an individual's screen to all in the room; we used this feature for presenters and audience Q&A in the symposium talks. Gather also has extensive online instructions and videos to help participants navigate using this platform (<https://support.gather.town/help>); we sent these training links to registrants a week before the event. We also had 1-2 hosts who were positioned at the entrance to the Gather space to welcome and orient attendees to the setup. Avatars enter a live video space when they are near one another, allowing the hosts to simply ask if the participant needed help and then provide the necessary instructions. One limiting factor with using Gather for a large conference was a technical limit to the number of participants who could be in a single conversation (i.e., <100 for our conference); Gather does, however, allow for easy integration of an external videoconferencing link for larger presentations (e.g., we used Zoom add-in), which allowed for up to 500 participants simultaneously at the time of our meeting. We used this feature for our all-participant events at the conference (i.e., keynote address, graduate school panel, and career panel).

We maintained the schedules of our previously hosted in-person conferences as much as possible, including designated break times and integrating the unique components of each (<https://www.midbrains.org/past-meetings/meeting-2021/>; Table 1).

In terms of pre-conference planning, we invited participants through established mGluRs and MidBrains email lists and advertised to both websites, resulting in a total of 230 registrants. Conference registration was free to



**Figure 2.** Screenshots of MidBrains-mGluRs 2021 poster presentation interactions. (A) *Poster room layout.* Individual posters were inserted as a PDF into each numbered virtual poster board. Avatars interact at each poster by entering the designated conversation space (purple tiles) and move between rooms by stepping on the doorways (green tiles). (B) *Participant interaction in poster room.* Participants can see and talk to each other when their avatars are in virtual proximity (top of screenshot). Standing near a poster provides a poster preview (bottom of screenshot). (C) *Participant poster interaction.* While in the private chat, participants can view and manipulate the full poster PDF on their own screen to follow the presentation.

Time (CDT)	Scheduled Event(s)
9:00am-9:15am	Welcome and announcements
9:15am-10:15am	Keynote Address by Dr. Damien Fair
10:15am-10:30am	Break
10:30am-11:15am	Poster Session (odd numbered posters) + Grad Fair #1
11:15am-12:15pm	Graduate Program panel
12:15pm-1:00pm	Break (lunch)
1:00pm-2:00pm	Symposium Sessions (graduate program research talks), Faculty meetings
2:00pm-3:00pm	“Beyond the Bench” Neuroscience Career Panel
3:00pm-3:15pm	Break
3:15pm-4:00pm	Poster Session (even numbered posters) + Grad Fair #2
4:05pm-4:15pm	Send off

*Table 1.* MidBrains-mGluRs 2021 conference schedule.

attendees as expenses were covered by financial sponsorship from neuroscience graduate school programs and Nu Rho Psi. Participant registration was due one week before the conference date so that we could send Gather links and an informational packet containing logistical information. Online poster abstract submissions were due two weeks before the conference date. Abstracts required a faculty sponsor. Lastly, a full PDF of each poster was due one week before the conference date so that it could be uploaded into the appropriate poster presentation space in Gather. In terms of creating the virtual space, we built the site using Gather templates and input from colleagues. We were able to visit a previous virtual conference space that a colleague had available on Gather to inform our designs. Based on the number of poster submissions, we made three poster halls containing ~12 posters each that were organized by SFN theme.

Overall, we successfully joined two regional undergraduate neuroscience conferences into a virtual one-day event. This event allowed both conferences to successfully navigate the evolving COVID-19 restrictions that could have caused last minute cancellation of an in-person event. The conference provided an opportunity for over 50 student authors to share their research in a total of 36 poster presentations. Twelve graduate programs in Neuroscience sponsored the event and participated in the graduate program fair; 5 primary sponsor programs contributed symposium speakers. We maintained program elements common to both conferences (keynote, undergraduate poster presentations) and enabled unique elements to be shared (included the graduate school panel discussion and symposium sessions held at MidBrains and the career panel discussion held at mGluRs). Amid the disruption of the pandemic, our conference provided students and faculty with the scientific exchange and community that is a core part of modern neuroscience. In

the remainder of this paper, we will reflect on our experiences, challenges, and successes in hosting a joint, synchronous, virtual conference.

### Benefits and Challenges of Virtual Conference Format

Virtual events and in-person events differently address factors involved in community exchange. While individuals may have personal preferences, each format can provide successful conference events. Importantly, the virtual format allowed our conferences to occur when in-person events were not an option. We were initially skeptical if we would be able to facilitate an effective virtual conference for our students. Through the planning process, we came to appreciate how many conference elements can be done well in a virtual setting. While there will always be a place for in-person gatherings, we found the benefits of a virtual conference useful and worth considering when planning future events. Through post-conference reflections and discussions among the organizers, we identified benefits and challenges that can inform and promote future conferences, both virtual and in-person (Table 2 on the next page provides a summary).

#### *Benefits of Virtual Conference Format*

The virtual format can increase accessibility for

<b>Benefits of Virtual Format</b>
Increases accessibility (decreases time/cost/liability of driving)
Major components can translate to virtual interactions (e.g., posters, speakers, graduate fair)
Lower attendee costs (decreases transportation, hotel, printing)
Lower host costs (e.g., food, reserving space, speaker travel; 5x-10x less expense)
Broader keynote speaker options
Registration/abstract submission can be closer to conference date
<b>Challenges of Virtual Format</b>
Promoting and sustaining engagement - ease of distraction/disconnection
Lower attendee commitment; divided focus of attendees
Reluctance to engage in another remote meeting over a weekend
Introducing newer students to format (isolated interactions online vs. common experiences in-person)
Promoting social interactions online
Lower incentive for hosting; less benefit to host than in-person meeting (e.g., host institution able to include more students in person)

Table 2. Specific benefits and challenges of virtual conference.

undergraduate neuroscience students and faculty members to participate in this event because the barrier of travel is eliminated. Our conference was attended by students across the Midwest, and other virtual conferences have enabled national attendance (e.g., NURVS). We had 165 undergraduates register for the conference from 30 different institutions in 8 states. While in-person conferences typically involve students involved in research who are presenting at the event, a virtual conference can allow for a broader range of student participation including newer laboratory students and students who are not yet involved in research (e.g., attendance part of a course assignment). Ironically, this ease of access may also connect with the challenge of committing to attend after registration.

The total number of institutions with undergraduates participating was less than the combined number of institutions involved in the last in-person iterations of these conferences but more than each conference individually (undergraduates from 30 institutions vs. undergraduates from 22 institutions for in-person MidBrains 2019 and 13 institutions for in-person mGluRs 2019). Having less institutions per conference participate compared to in-person events could have happened for reasons unrelated to the virtual format (e.g., not participating due to COVID), such as the limits COVID had placed on research participation or feeling burnt out on virtual format meetings in general. We considered that a virtual conference could allow for institutions that are new to these conferences, less well-known, and/or serving more diverse student populations to participate. In practice, most of our attendees came from institutions who had previously participated. We hope the virtual conference format enables additional institutions to attend but think that participation comes down to connecting with individual faculty at institutions to invite and support student participation which could be improved with better dissemination and an advance meeting schedule.

During the meeting, we had a faculty breakout session to discuss initial perceptions of the online conference and pros/cons of virtual and in-person formats. Our conversation identified accessibility and travel expenses as major factors influencing conference attendance. Faculty raised travel logistics as a limiting factor of attendance for in-person events; the further away an event is, the fewer participants will travel that distance to attend. Faculty identified tiers of distance as well; for example, most attendees come from within a 3-hour drive for an in-person event. An online event also negates the possibility of weather-related challenges that could cause some parties to cancel. Faculty also mentioned that some students work on the weekends, which in this case allowed them to attend parts of the conference when they would have missed an in-person, all-day event. Conference attendance and participation of faculty and students that also have weekend childcare or eldercare responsibilities may also be increased when a virtual conference option is available.

Though not necessarily a benefit of a virtual conference, we saw no negative impact on the attendance and participation at the student poster sessions. Poster engagement was high; the organizers rarely observed a

student presenter without an audience, and students reported appreciating the interactions they had with faculty at their posters. Prior to the conference date, each faculty registrant was assigned to attend 2-3 student poster presentations to ensure that all students engaged with an audience had a chance to present their findings and received feedback on their work, which has been suggested as best practice (Arcila Hernández et al., 2022). This decision was made in part because faculty attendees were less able to “look around” in the virtual Gather space as they navigated the poster rooms and online interactions were less spontaneous. We also asked faculty attendees to focus on conversations with students; this priority contrasted with previous in-person meetings when we had faculty focused on poster judging. The Gather platform worked very well for interactions among individuals at the posters. The participants entered a private real-time, video space where they could talk to one another as in any other Zoom or live video space. Though this video room removed them from the virtual space of Gather for a short time (until they walked their avatar away), it also provided a quiet and focused space for a conversation which overcomes some drawbacks of other virtual platforms (Holt et al., 2020). In addition, participants in the poster area could manipulate the full-sized poster on their own computer, allowing them to zoom, reread, or simply follow along as needed to fully appreciate the poster. This experience is similar to how participants would peruse a poster at an in-person session.

The virtual conference also allows for more diversity and flexibility with keynote speakers, allowing geographically-distant speakers to contribute to the conference (e.g., with no travel scheduling, the conference host can invite a speaker from anywhere; Dr. Steve Ramirez from Boston University gave a wonderful keynote address at the virtual 2020 MidBrains conference). Our keynote speaker was Dr. Damien Fair from the University of Minnesota, who could have attended in-person but ended up being able to participate while traveling with family. This setup also allowed the students in the mGluRs group to hear from a graduate program further afield from their home region.

Cost for both hosting and attending the conference were considerably reduced for virtual format compared to in-person format (e.g., 5x-10x reduced host costs; additional travel savings for attendees for transportation and lodging). While some elements of scientific exchange may be unique or preferable to in-person events, many can be accomplished in a virtual setting. The order of magnitude difference in expense between virtual and in-person conferences is worth considering to promote cost-effective scientific exchange for our students (e.g., combined conferences, every other year virtual vs. in-person, smaller virtual meetings for newer students).

Logistically, conferences hosted on a virtual platform also allow for more flexibility in timing related to registration and abstract submission. In-person conferences often require abstract submission and registration well in advance of the conference to prepare catering orders and printed abstract booklets. A virtual conference allows for later registration deadlines since there is less lead time needed for abstracts/posters (virtual “poster boards” can be added

with a simple mouse click) and omission of many logistics needed for in-person conferences (e.g., food order, room reservation, printed materials, name tags). The joint MidBrains/mGluRs conference abstract deadline occurred two weeks prior to the event and the registration deadline was one week prior to the event.

### *Challenges of Virtual Conference Format*

While there are clear upsides to a virtual conference, one of the biggest challenges of the virtual format was sustaining engagement for both students and faculty. First, we had twice as many people (>200) register for the virtual conference than were present in the Gather platform at any single time point during the conference (<100). Although a small percentage of registrants typically do not show up to an in-person meeting, absences have never been over 10% for a MidBrains or mGluRs conference. Second, as we well know from 2+ years of personal experience, having a virtual conference, training, or meeting open in a browser tab makes it easy to click away to something else for short periods of time, particularly for an all-day event. Over 60% of participants in meetings longer than 180 minutes report multitasking and 36% report that multitasking leads them to lose track of the meeting (Cao et al., 2021). By dividing their attention, participants get less out of the conference, perhaps leaving them with a feeling that the day was not as beneficial as it might have been (Cao et al., 2021). In addition, multi-tasking is ubiquitous and often is not perceived as negatively impacting learning or engagement (Lang, 2020). For example, one colleague logged into the conference from their office on campus, which allowed easy shifting of attention into email like a typical workday. Importantly, while faculty with experience in virtual conferences may be able to overcome these distractions, students attending their first conference will likely have a different experience.

Learning how to attend conferences is often a mentored activity, and faculty noted that they did not find students as interested in attending a virtual conference. Traveling to a conference site can help focus attention on the meeting in part by removing us from our daily environment and routines and by providing a stimulating environment where all individuals are focused on a specific topic. In addition, participating in person adds a sense of group comradery and allows for observational mimicry that is missing in virtual settings. Lastly, social interactions, the opportunity for faculty to catch-up with distant colleagues and for students to meet others with similar interests, is a strong motivation to attend and a large benefit of attending a conference in person. Social interactions online can be challenging as there tends to be less spontaneous and organic conversation. Though the Gather platform allows for these interactions, the physical cues of seeing a name badge with a familiar institution or glancing at the title of a poster across the room that sounds engaging are missing in the virtual environment.

Overall, this issue of engagement may be the single greatest factor influencing conference format decisions. We recommend thoughtful consideration of engagement to enable a productive virtual conference. Some potential

ideas for improvement included focused messaging to students in preparing for the conference (how to prioritize/block out time), reserving common space at the home institution with computer access (classroom/computer lab) to have a community component to attending the conference, and actively inviting students to participate (e.g., make part of class or student club activity, have students set goals during meeting such as attending a certain number of posters or asking a question in a talk). In terms of suggestions for improvement from our faculty breakout session, faculty recommended taking out the small, informal meeting rooms in the center Welcome space (no one was using them) and shrinking the center space to make transitions between activities easier for the avatars. We also recommend orienting the participants to the map of the space and the functionality of the areas in the first event within the conference.

We sent a post-conference survey to graduate school sponsor representatives to gather their feedback on this virtual meeting as well. All sponsors were grateful to have participated in the conference while also looking forward to returning to in-person interactions for recruiting. Overall, the virtual Grad Fair was not perceived as being as effective as in-person. Some of this issue might have been logistical in nature as few students entered the separate rooms that were created for the Grad Fair space, leading to lower interaction than was anticipated. This situation might be remedied by having Grad Fair tables in the same rooms as the poster sessions (which would better mimic the traditional MidBrains in-person format) or designating time during the conference exclusively for the Grad Fair.

### **Student Feedback on Virtual Conference Format**

One of the organizers (Dr. Carter) had students in his upper-level neuroscience class attend the conference. Many of these students had not participated in laboratory research or attended a conference yet demonstrated important learning gains from their conference experience. Students were asked to share a reflection on their experience at the conference, including (1) two neuroscience-related topics they learned about at the conference, including one from a poster they attended and (2) something that they learned about the scientific enterprise (e.g., something that surprised you, something that affirmed/reinforced a point).

Students can gain perspective of science in areas measured by major assessments of undergraduate research. For example, the Undergraduate Research Student Self-Assessment (URSSA) measures four constructs: Thinking and Working Like a Scientist, Personal Gains Related to Research Work, Skills, and Attitudes and Behaviors (Weston and Laursen 2015). While all four constructs may have been experienced in the conference setting, student feedback from the class focused primarily on thinking and working like a scientist. Many students indicated gaining greater understanding of the research process:

*"I loved the experience and opportunity to learn more about neuroscience research. The posters and speakers*

*were all excellent."*

*"While going to many different posters and getting to speak with all the research students at the conference, there was one common theme that stood out to me. Many research projects did not go perfectly as planned, but pretty much everyone I got to talk to told me about how they are going to improve their results in their next experiment. It was really inspiring to see how no one was giving up on their research, but just finding new methods and ways to learn more on their topics."*

*"Something that surprised me was how lots of the posters did not find significant results. While all data is good data, I'm sure some researchers were disappointed in these results. It reinforced to me how difficult science can be to conduct, it seems like most of what we see in science is the successful experiments, so it was interesting to be exposed to the other side of things. I think it is important to talk about these results though as to not make science seem as something that has to be significant to be important or helpful to the world of science."*

Some students also emphasized feeling connected to the scientific community through their interactions with peers, knowing presenters, and learning how research connects with careers:

*"I think the format of this conference was interesting as well. When I got into the conference website, I was greeted by someone who directed me to the room I needed to be in, and it was like I was in a whole other space & able to interact in real time with the people around me."*

*"This conference was not only educational but entertaining as well. I thoroughly enjoyed watching all the presenters talk about their research without having to decipher it on my own. It helped clarify difficult parts of the experiment that I might not have been able to understand on my own. It was also cool seeing classmates present their own posters."*

*"Something that I learned that surprised me was that graduate schools want to give students the chance to have diverse career fields, and how to make those connections to get you to where you want to be. From the poster presentations, the students presenting were able to plan what they were going to do for their next experiment from the results that they had gotten from the experiment that they presented. This was really cool because whether they do that right now or once they go off to grad school, they will be able to grow in ways that allow them to learn more."*

Overall, these insights indicate the value and importance of the conference experience to our undergraduates, one of the primary goals of these meetings. Their experience emphasized the value of attending conferences for all

students, including those not currently involved in research.

### Collaborating to Promote Scientific Exchange: Benefits of a Joint Virtual Conference Format

Hosting an undergraduate neuroscience meeting requires substantial effort and resources from organizers and host institutions. Finding volunteer hosts for these events may be challenging. Though we have outlined above some challenges to virtual meetings, we also identified a set of benefits of a joint virtual meeting (Table 3).

The virtual format allowed organizers for two meetings to combine our resources and time, which helped share the responsibilities needed for conference planning. If there are similar conference formats, elements can be split up between organizers and enable a lower per-organizer effort while maintaining the benefits of conference hosting. We were able to combine resource bases to gain broader recruitment for career panel speakers. We were able to include ideas from each conference schedule (MidBrains; graduate program talks, mGluRs; career panel discussion), which may have long-lasting impact on future in-person events as well. The expanded geographical interactions were also seen as generally helpful for everyone. Students had access to a wider range of graduate neuroscience programs, and the graduate sponsors had access to a larger network of undergraduate students for recruiting. Having a joint meeting may also provide unique outcomes (e.g., interactions between broader groups of students/faculty/sponsors) that add worthwhile benefit to the substantial time and effort of conference organizing.

### Summary: “Take Home” Messages and Considerations for Future Conferences

Conferences are an essential part of scientific exchange and student training in the neuroscience community. The COVID-19 pandemic has promoted the development and normalization of virtual versions of conferences and professional interactions using a variety of platforms (e.g., Gather, Remo, Zoom, Padlet, Mozilla Hubs). The setup of virtual poster sessions can be diverse and complex to fit your goals; for example, the virtual meetings for the Society for the Advancement of Biology Education Research in 2020 and 2021 included asynchronous and/or synchronous interactions, extended audience interactions pre/post conference, had video recordings of speakers, and included comment boxes for feedback (Arcila Hernández et al., 2022). Virtual presentations can also be used to involve the general public in classroom activities (e.g., open-source Mozilla Hubs; (Holt et al., 2020)). Virtual/hybrid events are part of future professional interactions for students and faculty going forward. As mentors, how do we continue the value and importance of conferences for undergraduates in virtual space? We have reviewed some benefits and challenges related to our experience organizing a joint virtual conference during the COVID-19 pandemic. Despite having no personal experience planning a virtual conference before this event, we organizers were able to have a successful conference – and you can too!

For virtual events, we suggest mimicking the best in-person conference experiences to promote attendee

Benefits of Joint Meeting
Graduate schools had access to students from a broader US population (i.e., graduate sponsors from upper Midwest typically only have access to MidBrains participants but were able to pull from two conference pools).
Students access to graduate programs from a broader geographic area.
Meeting organizers shared planning responsibilities and did not need to reserve/coordinate space
Additional perspective/exchange of ideas and events

Table 3. Summary of benefits of joint virtual meeting

interactions. Our conference prioritized real-time, face-to-face interactions and found Gather to best support that endeavor. For example, putting tables for a graduate program fair in a poster room can allow students to wander between posters and tables. Organizers should invest in virtual conference planning; one suggestion would be to find a way to share virtual templates. After our meeting, a FUN colleague requested a copy of our virtual space but we were not able to share our virtual space setup. Current Gather instructions, however, appear to indicate spaces can be cloned and given shared administrator access (<https://support.gather.town/help/copying-a-room-or-space>), so this issue may be resolved.

One fundamental challenge and opportunity for conference organizing is participant focus. Virtual meetings enable both unprecedented access and easy disengagement. Traveling to a physical location focuses our attention and removes us from our regular routine to engage in scientific exchange. With the rise in virtual interactions through devices, email, and social media, the challenge of actively promoting focused attention and opportunities to interact with other attendees may be similar for conferences for both in-person and virtual formats. This is a professional development opportunity for our students if a mentoring session precedes the conference.

The necessity of a virtual meeting gave us new perspective on scientific meetings and how we could further promote scientific exchange and community. For future benefit of students and faculty attending virtual conferences, we need to progress the mindset that virtual conferences can be excellent scientific meetings. While the prevalence of virtual meetings has grown out of necessity during the pandemic, virtual meetings can enable valuable scientific exchange for students and faculty. We encourage thinking about virtual meetings as a different kind of interaction rather than “alternative” or “inferior” conferences; their benefits can complement in-person events. With the rise in virtual professionalism, students now need to learn to interact in virtual space. We can provide an opportunity to learn and practice such interactions with virtual meetings. We hope insights from our experience can benefit future conference

organizers in planning scientific conferences, both for in-person and virtual settings.

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Received July 19, 2022; revised October 03, 2022; accepted October 5, 2022.

The authors would like to thank colleagues who laid the groundwork for our virtual meeting, particularly Dr. Shara Stough, Dr. Rupa Gordon, and Dr. Ian Harrington (Augustana College) for their thoughtful advice and materials from the virtual 2020 MidBrains conference. We thank Dr. Sarah Hankerson (University of St. Thomas) for recommending and giving input on using the Gather platform as a virtual conference format. We welcome colleagues interested in hosting virtual meetings to contact us for more detailed input and materials we created to help with virtual meeting planning.

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