2021 PhysTEC Online Conference Evaluation Report

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Executive Summary

The inaugural PhysTEC Online Conference was held March 5-6, 2021. The schedule ran from 11-5:20 ET each day, and included plenary sessions, breakouts, and networking, using the online tools QiqoChat, Zoom, and Gather.Town. [Conference website](#).

**Participation: Good attendance, few first-timers, mixture of institutions.**

Attendance at the inaugural online PhysTEC conference was similar to previous in-person conferences; over 80% of the 119 registrants attended and over 50% were in attendance at any one time. Most survey respondents attended “most” or the “full” conference, but 30% attended half (or less) of the conference. The virtual format did not seem to draw new attendees: only 10% were first-time attendees (compared to 30-40% in previous years). Most attendees (60%) were at formerly or currently funded sites, and attendees were split among primarily undergraduate (30%), master’s granting (21%) and PhD-granting (43%) institutions. Most are tenured or tenure-track faculty (60%) but many are teaching faculty (21%). While about half contributed to the conference (through a talk or a poster), very few (N=4) did so for the first time. While only a few teachers or TIRs responded to the survey, they overwhelmingly felt that the conference was deeply relevant:

- *I found it deeply motivating and inspiring. PhysTEC is such a better fit for me personally than most HS Physics teacher conferences because the broader topics and lens are much more transferable to my classroom.* (K12 teacher)

**Participant and presenter experience: Very positive**

Participants’ experience with the online conference was very positive. Participants were highly satisfied with the technical quality, and the content. Almost all (93%) indicated that they gained knowledge about physics teacher preparation that was worth the time of their attendance. Many specifically commented that they were surprised at how well the online format worked. People indicated learning that ranged from concrete to philosophical and named many concrete plans that arose from their attendance. Particularly appreciated were the Teacher of the Year, NSF Funding Resources, Leveraging Cultural Resources, and Rehumanizing Mathematics. Presenters also indicated they felt well-prepared for the online conference and enjoyed it.

- *This is the best online conference I have attended - well organized, clear communication, transparent navigation in the qiqochat space. It's still not as much fun as an in-person conference, but it's the closest I've experienced. Very worthwhile, and I'm glad I came.*

- *This conference was way better than I thought an online conference could be. As always, inspiring to be around my colleagues!*

**Schedule and technical aspects: Positive, with a few improvements**

Participants indicated a high level of satisfaction with all technical aspects of the conference but Gather.Town was rated less positively and had some difficulties (e.g. video/audio not working). The difficulty of opening links in new tabs in QiqoChat was mentioned. The poster session was appreciated but poorly attended and interacting with the virtual posters had some challenges.
Participants appreciated the conference schedule (starting late, short days, substantial breaks, limited parallel sessions).

I provide a longer quote from a presenter which summarizes all the findings pretty nicely (emphasis mine):

- I know you all are looking for ideas about how to do this even better next time, but for me it was truly great----I got to talk deeply with people whose insights I value; it was so much less stressful than traveling to conferences in person--critical during this super-stressful year; I was impressed at how well you all were able to reproduce the best things about conferences while avoiding the worst parts (travel--I used to love conference travel when I was younger but had come to hate it lately). I hope we go back to face to face soon--it’s critical for young scholars just starting to build networks. But in this hard year, you all did a beautiful job creating something effective.

**Online vs. in-person conferences: There is a place for both**

There is a clear benefit to offering the conference online, but this format has inherent limitations. The in-person conference allowed for better networking and learning, but the online conference is convenient and cost-effective. Reported learning gains are positive for the online conference, but lower than the previous in-person conference. Online conferences reduce the barrier of cost and time: About two-thirds of participants indicated that cost and/or time to travel had been a barrier to attendance in the past. Most indicated that they would attend this conference online again. Most would prefer the in-person conference in the future if offered a choice, but several were very interested in online options. A minority indicated that they would only attend the conference if it were online in the future or that online offerings would increase the frequency of their attendance. However, open-ended responses showed a clear interest in having online options available. There was a clear consensus that in-person conferences allow for better networking and informal, emergent connections. Some people miss the pre-conference workshops. Online conferences were seen as more convenient and cost-effective, which may tip the scales towards attendance for some, depending on what is going on in their personal and professional lives. However, several also indicated that they found it more difficult to focus during an online conference. Thus, each format offers pros and cons, and both are valuable.

- I was able to attend some of the sessions even though other commitments would have made it impossible for me to go to an in-person conference. Something is better than nothing.

- really missed the in person networking. I did not meet new people and in the past I always met a few new people that became part of my network.

- I strongly prefer the in-person conference experience. However - sometimes the time / cost is prohibitive -- so it’s possible at some point in the future that I would be able to attend online but not in person.

- I can imagine how an online conference would be better for some high school physics teachers.
Institutional differences: PUI’s are under-resourced
Several differences were apparent between those at PhD-granting institutions and those at undergraduate or master’s institutions. Fewer of those at PhD-granting institutions attended the full conference (50% compared to 80-90%). Those at PhD-granting institutions were more likely to have gone to 3 or more previous PhysTEC conferences. Those at primarily undergraduate institutions more often reported not being able to attend the conference previously due to cost or time to travel. These findings seem to reflect the greater resources at PhD-granting institutions, and less value placed on the opportunity to attend the virtual conference for low cost.

Reasons for attending: Community engagement and a spirit of improvement
Based on responses to the 5 Why’s, people attend the conference to stay in touch with a community they care about, learn from others, and out of obligation to / support of PhysTEC. They aim to support program improvement, learn from broad perspectives, and have a personal commitment to improve physics, teacher preparation, and the world. There is a clear spirit among attendees that they need to learn from one another to improve themselves, their programs, and the world. There is a sense that the PhysTEC community is seen as wise and diverse. Those with new teaching tracks sometimes attend the conference to shop for ideas for that new track.

New ideas for PhysTEC: Focusing on Bachelor’s institutions, smaller institutions, and providing ongoing nimble mini-grants.
In a table discussion, participants made the following requests of PhysTEC:
  1. Provide more explicit support and guidance for Bachelor’s granting institutions, especially given their state of threat and contribution to teacher education.
  2. Provide a 5+ club for smaller institutions (e.g. 2+ club) based on institution size.
  3. Provide mini-grants on an annual basis to support ongoing activities.

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Recommendations

Based on these findings I offer the following recommendations.

Offer the conference online on an ongoing basis.
My personal recommendation is to provide it online every other year, and offer all plenaries online during in-person conferences. This can maintain engagement to a broad audience, including teachers and under-resourced institutions (especially PUIs). However, those online conferences need to be advertised differently to draw newcomers. One particularly ripe audience are those with a new teaching track in the department: Is there any way to identify such people? I suggest devoting a few strategy sessions to the planning of future online offerings. Do not permanently replace the conference with an online version however; many irreplaceable benefits were cited for the in-person version.
Make sure there is adequate “new” content.
Given the number of repeat attendees, it is always difficult to find “new” things to offer. I was honestly surprised that so many people felt that the conference was a repeat of last year; I did not feel that this was the case. There was a request for more on making changes to policy at state/national level.

Prioritize the icebreaker and explore additional networking options.
Prioritize the icebreaker: Maintain at least 20-30 minutes for this activity and protect that time. Consider how to support the kinds of “chance” encounters and emergent conversations that occur at the in-person conference. One option is an early networking session (perhaps table topics) to get ideas flowing after the first plenary. Another is to include networking within plenary sessions (where all are in attendance) to reduce the drop-off during the dedicated, less focused networking time.

Make a few changes to the conference schedule and technology.
While the conference went very well, a few changes were suggested:
- Offer pre-conference workshops for deeper learning.
- Provide a walk-through of Gather.Town (e.g. in video, and during plenary), including troubleshooting tips, and how the poster session will work.
- Consider offering a separate set of conference links (for google docs and Gather links) outside of QiqoChat to avoid the problem of opening within the QiqoChat frame.
- List all time zones on the schedule.
- Consider some longer sessions (e.g. 75 minutes).
- Do not schedule more than one parallel session opposite (1) NSF officer presentations and (2) presentations involving multiple funded sites.
- Find a way to draw greater attendance to the poster and table topics.
- Do posters as odd/even to allow presenters to circulate.
- Streamline the presenter preparation a little (fewer emails, targeted emails to presenters with their specific zoom link, technical preparation closer to the time), and offer flexibility in slides.

Provide explicit support for primarily undergraduate and smaller institutions.
Offer programs (within the conference, and the project as a whole) aimed at these institutions. Create a version of the 5+ club aimed at smaller institutions (e.g. 2+ club) based on institutional size.

Provide annual mini-grants of $1000-5000.
These mini grants would be a valuable way to continue to spark activity at institutions in an ongoing fashion. They suggested an annual RFP for $1000-5000, in early Fall, with a short application, requiring the use of PhysTEC resources, and a simple report. Uses of such mini-grants would include an RET opportunity for a pre-service teacher, supporting a TAG group, buying some equipment, stipends for mentor teachers, and gatherings between in-service and pre-service teachers.
Findings

Methods

These evaluation findings are based upon the following measures:

1. **Participant Stats - PhysTEC 2021** data sheet of attendance
2. Five Why’s icebreaker activity ([Activity as Google Form](#)) ([Results](#))
   a. A total of 50 responses were received
3. Conference survey ([SurveyMonkey form](#))
   a. A total of 47 complete responses were received

About the participants and attendance

**Sixty-percent of registrants attended. Most did not attend the whole conference.**

A total of 117 unique people registered for the conference; only 13 did not attend for a 88% attendance rate. Approximately 59% (N=70) 70 (59%) were in attendance at any one time. Attendance was roughly constant across the conference with the exception of the “talk out” sessions. Most survey respondents attended most (47%) or all (23%) of the conference; 30% attended half or less.

**Attendance was less intensive among those at PhD-granting institutions.** Only about 50% of those at PhD-granting institutions indicated that they attended most or the full conference, compared to 80-90% at PUIs and Master’s granting.

The two with limited attendance, or lack of attendance, gave these reasons why, which indicate both technical issues and a lack of substantial interest.

- Pandemic multi-tasking due to family and just not spending enough time myself figuring out in advance what I should see. I wish that the talk possibilities to attend had been a little easier to look in advance at to see that I wanted to attend. This was a small conference- a single email or single long web-page would have been better. The moment one has to click into anything one starts to lose potential audience (like me). The poster session was the only one I attended.
- Could not get it to work. Tried to open MEET and it looped forever without adding me to a meeting. After trying for 15 mins. I quitted.
The virtual format did not draw new attendees. Only 6 respondents (on the survey, and the Five Why’s), or about 11%, indicated that this was their first PhysTEC conference. This compares unfavorably to the 40% of new attendees in 2019, and 30% in 2018. Those for whom it was their first conference were most often from Member institutions. About half had been at 3 or more previous conferences, and many of these were at PhD-granting institutions.

Most attendees were funded sites (current or former) and member institutions. About one-half are at PhD-granting institutions. Formerly funded: 21%. Currently funded: 38%. Other member institution: 15%. Primarily undergraduate: 30%. Master’s granting: 21%. PhD-granting: 43%.

Most are tenure-track faculty, but many are teaching faculty. Out of 47 responses, 28 (60%) were tenured or tenure-track faculty and 10 (21%) were teaching faculty. Two were K12 teachers, and 7 answered “other”. Those who answered “other” included...
staff, administrator, research faculty, and adjunct. There were no graduate students, postdoctoral fellows, or emeritus faculty.

**Almost half of attendees contributed to the conference, but not for the first time.**
A total of 21 (out of 47) presented a talk or a poster. Only 4 of these did so for the first time. This could be improved for the future. However, all those who presented felt that they were well-supported and prepared.

**Teachers, and teachers in residence, felt that their needs were met.**
We specifically asked if people's needs with respect to the roles above were met. Teachers put in the following comments:

- I found it deeply motivating and inspiring. PhysTEC is such a better fit for me personally than most HS Physics teacher conferences because the broader topics and lens are much more transferable to my classroom. (K12 teacher)
- PhysTEC is one of my favorite conferences as a HS Physics teacher because the larger, broader topics offer me rich experiences to connect to. I would highly recommend PhysTEC to any HS teacher who is not explicitly involved in AP or IB curriculum because there are so many more applicable conversations. (K12 teacher)
- Yes, I found the sessions I attended very helpful to my current position. (TIR)
- Absolutely. (TIR)

**Virtual conference vs. in-person**

**Participants’ overall experience was very positive.**
They found the conference well-organized and informative. Presenters also had a positive experience. Many people (presenters and participants) specifically said that this went as well as an online conference could go, and that they were surprised at how well it worked.

**About two-thirds indicated that they had previously wanted to attend the conference but were unable to -- mostly due to cost, or time to travel.** A greater percentage of these responses were due to those at primarily undergraduate institutions.
Only one of those indicating any of these barriers were attending for the first time.
Participants would attend the conference online again. If offered the choice, most would attend the in-person version in the future, but some would prefer the online conference. These responses (surprisingly) did not differ meaningfully by institution type -- although all who would only attend if it were online in the future were at PhD-granting institutions. I was not able to find obvious defining characteristics of the 5 responding this way.

There is a clear consensus that in-person conferences allow for better networking and emergent conversations, and focused attention, though online is more convenient. Experienced attendees were asked to compare their experience with the regular face-to-face PhysTEC conference, compared to this virtual one. Out of 35 responses to this question all but two mentioned “networking” or meeting other people as the main benefit of in-person interactions. The benefit of networking included meeting new people, opportunities for side conversations or informal discussions, longer or richer discussions, and creating collaborations.

Most would have preferred to be in person but some preferred this online setting. Full open-ended responses are in the Appendix.
Most mentioned the power of informal networking -- chance conversations between sessions and over food. Also mentioned were the benefit of focusing completely on the conference by getting away from the office (N=5), pre-conference workshops (N=2), and visiting new places (N=2). When asked what was better about the online conference, nearly all responses mentioned cost (N=8) or convenience or lack of travel (N=25). Within the “convenience” factor people mentioned that they were able to attend to family responsibilities, it was easier to fit into their schedule, they did not have to make arrangements to travel or undergo the physical fatigue of travel. Two mentioned that there is a better archive of the conference information through the notes documents, and two indicated that it was nice that nobody could see them crying when the Teacher of the Year spoke. Several presenters also said they prefer the in-person but it is very useful to have the online option when needed. Below are a few representative quotes:

- I was able to attend some of the sessions even though other commitments would have made it impossible for me to go to an in-person conference. Something is better than nothing.
- Convenience - no travel and felt I could really pick and choose sessions I was interested in going to, and could skip other sessions I wasn’t interested in.
- I could go for a run during the break and I could see my family. Mostly I didn’t have the physical and mental wear of traveling.
- I did not have to put the rest of my life, and job on hold while I travel. And it cost next to nothing...so I did not have to go beg for money from my Provost or use significant amounts of grant money.
- I’m often out or low on University travel funds by March so online is more affordable if I need to pay some/all out of pocket. This has deterred me from going to some on-ground PhysTEC conferences event though I really like these conferences and want to attend.
- No one could see me bawling when the Teacher of the Year spoke.

Offering online and in-person seems an important future direction.
While there is a clear loss in offering the conference online, it also enabled many people to attend who could not otherwise, reducing barriers to engaging in physics teacher education. There is a loss in the hands-on aspect, which could be partially ameliorated through providing some pre-conference workshops as done in the face-to-face. Comments regarding the comparison of online versus face-to-face showed a variety of opinion, showing that each option is important to offer.

Conference content and learning
Participants learned new things in this online format, and 93% agreed that what they learned merited the time of attendance.
Many commented specifically that they were surprised how well the online format worked. The vast majority agreed that the knowledge gained merited the time of attendance (see graphic below).
Those at non-PhD-granting institutions were more likely to strongly agree with this question, as were newcomers; but agreement was positive across all types of attendees (see graphics next page).
Learning outcomes were positive, especially for recruiting and creating a professional community. However, gains were lower than in the 2019 conference. On the next page are the learning outcomes; followed by display of the results by institution type. Gains were most positive for recruitment (59% medium or large gain), creating a professional community, and advocating for physics teacher education -- and many of these gains were larger for those at PhD-granting institutions. Gains were lower for the 2019 Conference across the board: For example, “Recruitment into teaching” had 83% with medium or large gain in 2019 vs 59% in 2021, and “Professional community” had 74% with medium or large gain in 2019 vs 43% in 2021. I suggest these lower gains represent the limitations of the online format.
At this conference, to what degree did you gain knowledge that will help you to effectively implement the following program elements?

<table>
<thead>
<tr>
<th>Program Element</th>
<th>PhD_Granting</th>
<th>Non_PhD_Granting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advocacy for physics teacher education regional/state</td>
<td>75%</td>
<td>75%</td>
</tr>
<tr>
<td>Advocating for physics teacher education in institution</td>
<td>53%</td>
<td>67%</td>
</tr>
<tr>
<td>Assessment of physics teacher education program</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coursework for preparing physics teachers</td>
<td>81%</td>
<td>70%</td>
</tr>
<tr>
<td>Developing or implementing LA program</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interfacing with HS teachers</td>
<td>71%</td>
<td>81%</td>
</tr>
<tr>
<td>Mentoring by HS teachers</td>
<td>81%</td>
<td>80%</td>
</tr>
<tr>
<td>Professional community of teachers</td>
<td>56%</td>
<td>60%</td>
</tr>
<tr>
<td>Providing early teaching experiences in physics</td>
<td>75%</td>
<td>75%</td>
</tr>
<tr>
<td>Recruitment into physics teaching</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seeking funding for physics teacher education</td>
<td>76%</td>
<td>71%</td>
</tr>
</tbody>
</table>

Percentage

Response: No Gain | Small Gain | Medium Gain | Large Gain

100 50 0 50 100
In open-ended responses (see Appendix) mentioned many new ideas gained, from the practical (e.g. an online Master’s, improving an LA program), to the inspirational (e.g. Teacher of the Year, physics identity, inclusive teaching). As in previous evaluations, people seem to appreciate a mixture of practical and philosophical sessions. The comments indicate the depth of intellectual engagement in the content for at least some attendees.

**Participants left the conference with concrete plans.**
Participants mentioned a wide variety of things they plan to do at their home institutions (see Appendix), including new licensure pathways, inclusive teaching strategies, recruitment strategies, changes to the pedagogy class, applying for new grants, the PTEPA rubric, explore physics identity work, and engage further in equity work.

**Particularly popular sessions were Teacher of the Year, NSF Funding Opportunities, Leveraging Cultural Resources to Address Trauma, and Rehumanizing Mathematics.** We did not include ratings on sessions, but several people mentioned these sessions as popular. Also mentioned were GFO and Periscope. Other sessions requested included pre-conference workshops, hands-on sessions, and strategies to change policy at the state/national level.

**One person made an additional comment about the potentially political ramifications of some of the conference content, and I would like to include this for consideration by the PMT.**
“Not sure where to include this thought. Topics of diversity are inherently emotional, personal, and (unfortunately) political. This conference feels like it is moving from information providing and support to borderline coercion into “acceptable” viewpoints (acknowledging native american tribes used to be mentioned but now takes 1/3 of a speakers time, gender discussions moving from acceptance and inclusion to instructions to avoid the word “male”, ...). The environment does not feel welcoming to healthy discussions of these topics; it felt as though non-conforming opinions are not welcome, much as these very groups felt in the past. I support the APS statement on the Capitol riot. However, people were killed and businesses and police stations were burned in my state last summer, and there was no statement. That makes it political. This did not keep the conference from being useful, but the topics are no longer primarily about supporting physics teachers.”

**Virtual conference: Format and Schedule**
**Participants were satisfied with conference elements.** As shown in the graphic below, participants were satisfied or highly satisfied with technical quality, communication, ease of finding information, plenary and breakout sessions, as well as the 3 conference platforms (Qiqochat, Zoom and Gather). Poster sessions, talk-outs and table discussions were not as positively rated but many did not attend these sessions and their “N/A” responses account for many of the missing responses.
Below are results from open-ended responses. All open-ended responses are available in the Appendix.

**Participants suggest keeping Qiqo.Chat, Gather, and Zoom, but Gather had significant technical difficulties.**

A few participants and several presenters suggested keeping QiqoChat specifically, and many said the overall format worked well. One indicated that it was difficult to open items in a new tab. I noticed it was annoying to be stuck in the QiqoChat frame and difficult to find Google Doc direct links. Participants liked Gather.Town, but some experienced technical issues (typically around video/audio not working and not knowing to exit and return to fix it). Many appreciated having the Google Docs for notes. Thus, some ideas for the future include:

- Making it easier to access items from outside QiqoChat (e.g. in a web-based set of links)
- Giving troubleshooting tips for Gather in advance.
- Using Gather for more structured informal networking (e.g. make appointments to meet up in Gather).
- The only issue I ran into was that gathertown and the tabs in Qiqo Chat didn’t play together well. I had difficulty using notes and gathertown without getting kicked out of gathertown. (Presenter)

**Presenters were also pleased with the format, and felt well-prepared, but offered a few improvements.**

Most presenters were pleased with the online structure and felt well-prepared, but a few suggested some improvements. Suggestions included reducing the number of pre-meeting emails, allowing presenters to use their own slide format and advance their own slides, giving presenters their own direct zoom link, using a visual timer during lightening sessions, providing 75 minutes per session, using longer breakouts, and holding the technical orientation closer to the meeting time. However, none of these improvements were mentioned by more than one person, and most responses were very positive, with several appreciating Annelise/Skylen:

- The Qiqochat interface was terrific - made it really easy to get around and find everything I needed. The collaborative google docs were great. Gathertown was nice for the informal space.
- It was absolutely wonderful! It was such an easy space to access and navigate, Skylen did a fantastic job of orienting us to both zoom and qiqo, and gave ample time for
talks/resources to be submitted.

The poster session was appreciated but could be improved. The poster session was appreciated but often difficult due to technical issues with Gather, people felt awkward breaking into a Gather “bubble” and had trouble reading non-verbal cues as people moved through their space, and presenters weren’t able to roam. One person felt they wished they had been better informed about how the poster session would work. One person suggested splitting the posters into odds/evens to allow presenters to circulate. Another suggested doing posters as a “speed dating” exercise (3 minute overview, 1 question). Poster session attendance was also sparse.

Participants appreciated the overall conference schedule. Particularly mentioned were breaks between sessions, limited choices between concurrent sessions, a late start for the east coast, and not running the conference for a full day. Most commonly mentioned were the substantial breaks. A few suggestions for improvement were made:

- Listing all times as ET on the schedule
- Offering a full day pre-conference training
- Add more “hands on” presentations.
- Make it clear whether presentation recordings will be available, and where, since people could not attend all sessions.
- A few requested longer sessions.
- A few requested more time for networking.
- A few mentioned that the sessions were very similar to last year and asked for more “new” content.
- I noticed that a few sessions were highly-attended, and hijacked participants from other sessions: Particularly the NSF officer session (which was popular) and that session sharing ideas from supported sites (which were the majority of attendees). Often, 2 parallel sessions would have been adequate.
- I felt the table topics worked well, but there could have been fewer topics, and perhaps participants could have voted on their topics.
The Five Why’s activity

This is the second year the Five Why’s activity has been used as an icebreaker. Participants are asked why they attended the conference, and then asked to read what they just wrote and ask themselves “Why is that true?” This process repeats through 5 total levels of “Why?” A total of 50 unique responses were received from this activity, with the majority from currently or formerly funded sites (Comprehensives - 26; Recruiting - 8; Fellow - 6; Targeted - 1) or Member institutions (17). Last year responses were coded responses into a series of categories (see 2020 report). I did not code every response but examined for trends. I consider the first “Why” to be a surface reason for attending, the 3rd why to get to some personal or contextual reasons, and the 5th “Why” a deeper, end-chain reason. The findings are below.

<table>
<thead>
<tr>
<th>Surface reasons (1st Why)</th>
<th>Mid-chain reasons (3rd Why)</th>
<th>End-chain reasons (5th Why)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Summary:</strong> To learn, stay in touch, and because I made a commitment to PhysTEC.</td>
<td><strong>Summary:</strong> Because I care, because this is a place to gather ideas, to improve.</td>
<td><strong>Summary:</strong> To make some aspect of the world better.</td>
</tr>
<tr>
<td>To stay in touch with the community (N=12). These people want to stay in touch with other physics teacher educators, see what is happening in PhysTEC, and meet up with friends and colleagues.</td>
<td>Because I have a personal commitment to the cause (N=11). These people stated personal concerns and beliefs about the importance of preparing future teachers.</td>
<td>To improve physics (N=5). These people want all people to have access to learn physics, or to prepare the next generation of physicists.</td>
</tr>
<tr>
<td>Because I was invited (N=9). These people are presenting or were invited to attend.</td>
<td>To support program improvement (N=9). These people focused in needed improvements to their programs, mostly in recruiting.</td>
<td>Because there is a national teacher shortage (N=5). These people specifically indicated the need for more physics teachers.</td>
</tr>
<tr>
<td>Because of the obligation or support of PhysTEC (N=6). These people want to support PhysTEC’s mission, or are at supported sites and fulfilling their obligations.</td>
<td>Broad perspectives are useful to everyone (N=7). These people specifically indicated that new and diverse perspectives are available within the community, and that this helps lifts all boats.</td>
<td>To improve the world or public literacy (N=5). These people want an informed public, and positive impacts on the world.</td>
</tr>
<tr>
<td>To see what others are doing (N=5). These people want to see what others are doing in their programs and to get ideas from other sites.</td>
<td>A few others cited institutional commitment, or a desire for personal growth, or to support excellence in physics as a discipline.</td>
<td>Broad perspectives are useful to everyone (N=5). This theme arose again at this level, indicating that hearing from others is important in learning.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>To give students access to fulfilling career choices (N=4). These people want students to be able to fulfill their potential as teachers.</td>
</tr>
</tbody>
</table>
Thus:
People attend the conference to stay in touch with a community they care about, learn from others, and out of obligation to / support of PhysTEC.

They aim to support program improvement, learn from broad perspectives, and have a personal commitment to improve physics, teacher preparation, and the world.

What strikes me in these results in particular is the focus on learning from one another, broadening perspectives, and improving one’s self, program, and institution. PhysTEC attendees are very *improvement* focused and attend to harvest ideas from what they see as a wise and diverse community. The strength of the community is in the shared commitment and expertise. I notice that the new attendees tended to have more general reasons for attending (a few had started a new program, and mostly were looking for ideas). I wonder if there is an opportunity to identify departments with new teaching tracks to induct into the community via conference attendance in the future?

Below are a few sample reasoning chains to give a sense of the results.

Participant A: (Comprehensive site)
1. To be more connected with the community
2. To help support us in our endeavors as a physTEC comprehensive site
3. To get ideas about how to be better at recruiting and retaining students into our secondary ed program
4. To graduate more secondary ed students from our university
5. To help support the need for physics teachers across the country

Participant B: (Member institution)
1. Asked to host a session and looking forward to learning about what folks are currently doing in physics teacher efforts.
2. I always get lots of great ideas about effective physics teaching and learning that I have brought back to my institution - have some knowledge of the topic we are hosting a session on.
3. There is alot of great collective expertise in this community.
4. I think these are folks that share certain values that lead them to this type of work.
5. this is tougher - i think everyone comes to this work from a different space and for a different reason - so while the values might be the same ... not sure of the reasons.

Participant C: (Recruiting site)
1. Because we are a recruiting site, I want to meet up with the friends/colleagues I've made here, and to learn ways to support our pre-service physics teachers
2. Because I learn something from these colleagues every time I meet with them and I miss having social interactions like this, and because our pre-service teachers need different support than other physics majors
3. Because my colleagues are in the same boat as me, because the pandemic has forced me to be less social, and because our physics majors are usually taught assuming they will go to grad school for a physics PhD and are not provided the support needed to learn how to teach
4. Because we all want to produce more highly qualified physics teachers
5. Because we need more highly qualified physics teachers

Participant D: (Member institution; new attendee)
1. We just recently started B.A. physics leading MAT program
2. I want to know more about the program supporting PHYS TEC from other colleagues.
3. Phys TEC seems like an interesting project and I am here to learn more tips.
4. Meeting with colleagues and learn from their experience
5. That how to make this program more successful.

A few participants commented that they enjoyed the activity and that they learned a lot from talking in the small groups. A few requested more time in breakouts (it was shortened to less than 5 minutes). I suggest allowing no less than 20 minutes, and perhaps longer, for 5 Why’s in the future, to allow ample time for the breakout discussions. This is an important part of welcoming newcomers, and allowing for early networking. An additional idea is to have a coffee break / networking immediately after the first plenary to allow for that networking.

Idea Buffet outcomes

I ran a table discussion called “idea buffet,” where we asked participants what PhysTEC should offer to help you. We had 4 people come share ideas. Here are the results of that discussion.

PhysTEC needs to support Bachelor’s granting institutions.
This is a missed opportunity for the project, given the contribution of PUls to teacher education. They suggested having a dedicated session in the conference for Bachelor’s granting institutions, and offering particular supports outside the conference -- recognizing that many of these institutions are now under threat (but the R1 schools are not).

PhysTEC needs a 5+ club for smaller institutions.
David May was present at this discussion, and we discussed offering a 2+ and a 5+ club award, and using undergrad institutional enrollment as a filter to determine which award an institution is eligible for.

PhysTEC could provide small, nimble chunks of money.
The group was very interested in the idea of mini-grants which I proposed, indicating that this would be a valuable way to continue to spark activity at institutions in an ongoing fashion. They suggested an annual RFP for $1000-5000, in early Fall, with a short application, requiring the use of PhysTEC resources, and a simple report. Uses of such mini-grants could include an RET opportunity for a pre-service teacher, supporting a TAG group, buying some equipment, stipends for mentor teachers, and gatherings between in-service and pre-service teachers.