

# Collaborative Research: PROfessional Development and Uptake through Collaborative Teams (PRODUCT) Supporting Inquiry Based Learning in Undergraduate Mathematics

## Evaluation Report: 2020 Online Workshops

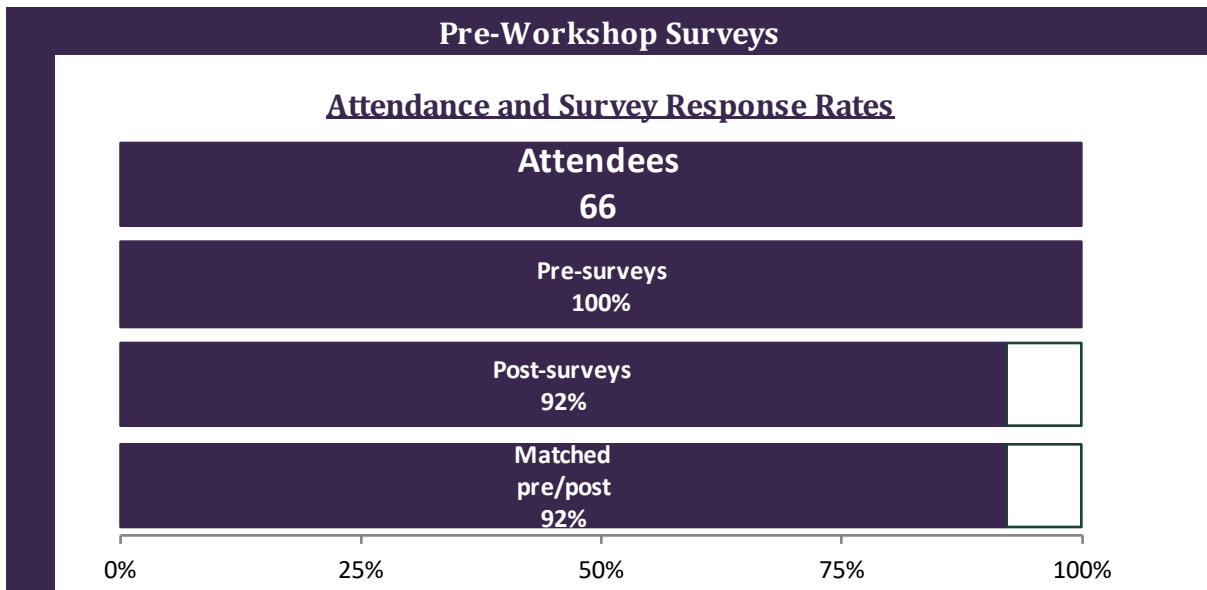
**April 2021**

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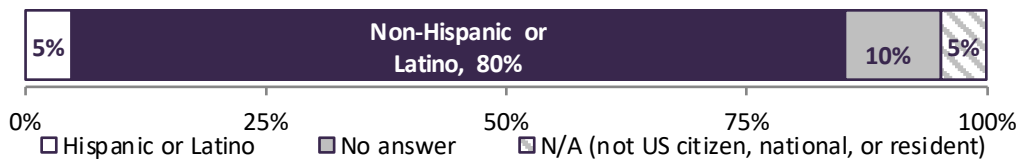
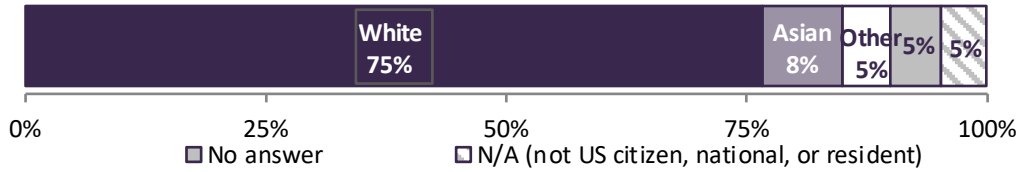
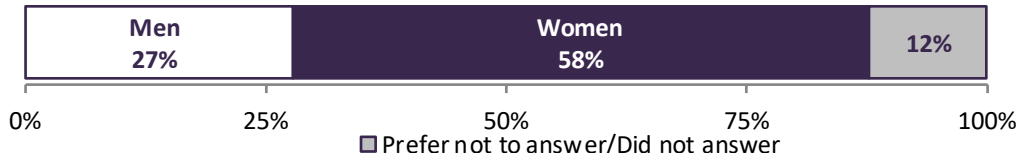
This evaluation report covers combined data from pre- and post-workshop surveys for 3 intensive, online workshops (IWS): 1 extended mini-course held June 16-July 2 (“Lake SCIBL,” for Summer Camp IBL, IWS 12), and 2 four-day intensives, held June 23-26 (“JEDIBL,” IWS 13), and July 6-9 (“JULIBL,” IWS 14). Participants were asked to pre-register online and complete a brief survey; a similar survey was administered online during the final day of the workshop. For a full description of data collection and analysis methods, please see the “PRODUCT Project Methods” document (available from the authors).

### Context

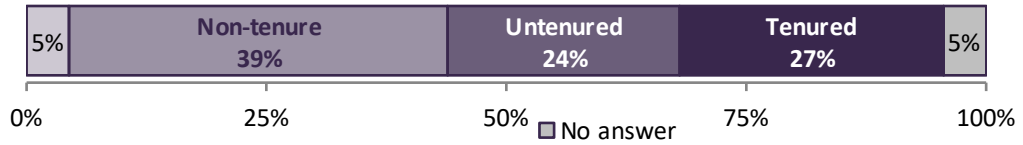
These 12th, 13th, and 14th ProDUCT workshops served 66 participants. Because of the COVID-19 pandemic, the workshops were adapted for online delivery based on the model developed during the previous SPIGOT project and refined under this project. The model includes 4 main types of sessions: (1) Literature to Practice sessions - where participants read and discussed research about IBL and active learning, (2) Video sessions - where participants watched and analyzed IBL classes, (3) Nuts & Bolts sessions - where participants and staff discussed how to structure and run an IBL class, and (4) Course Content sessions - where participants worked individually or in small groups, with staff guidance, to develop materials to use in their own courses. In 2020, some of these activities were asynchronous and some synchronous, and some versions of the workshop blended multiple strands for the sake of time.



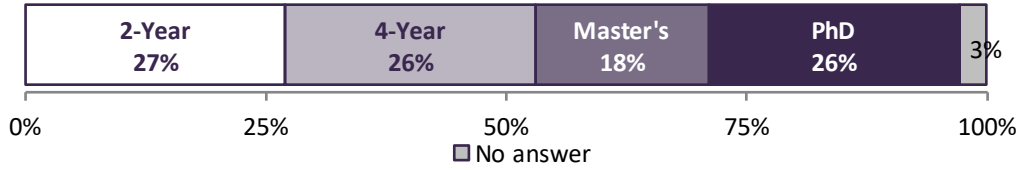
### Demographics



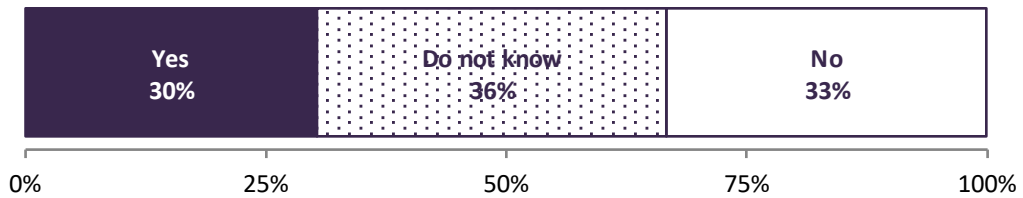
### Appointment



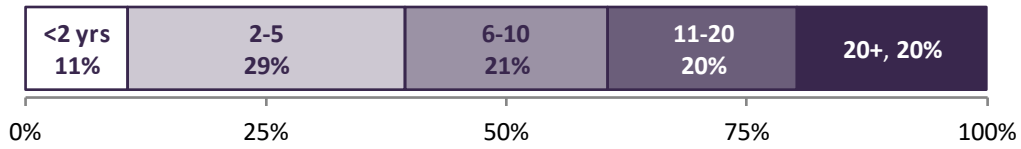
### Institution type



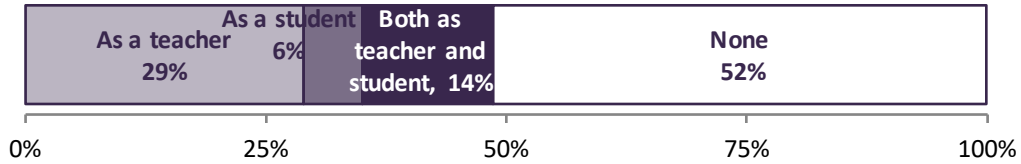
### Minority-serving institution



*Years of teaching experience*

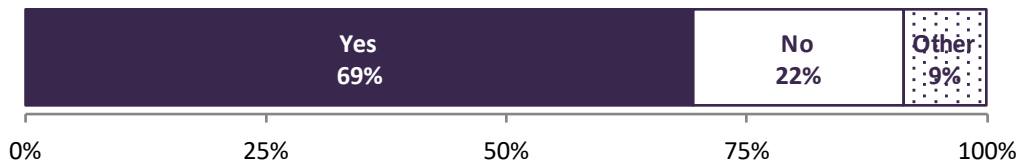


*Previous experience with IBL*

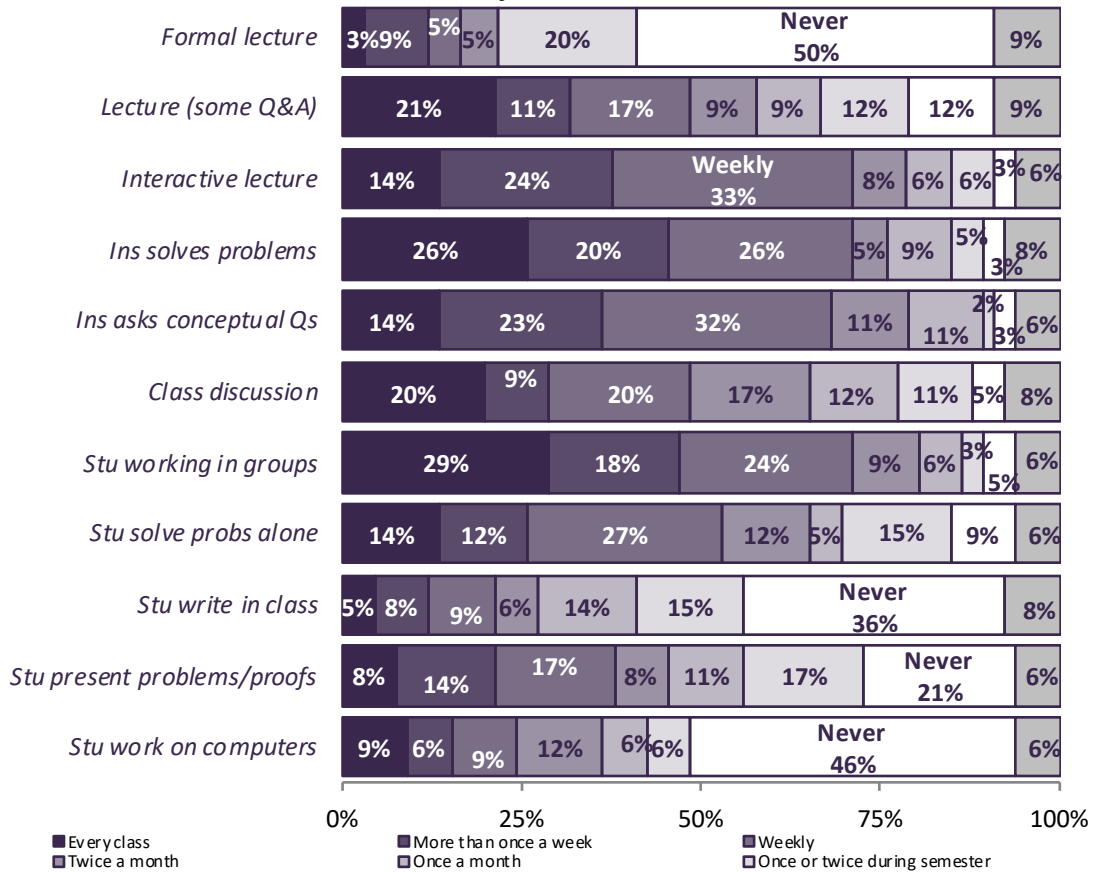


**Initial Teaching Practices for Target Course**

*Taught class before? ("No" responses skip frequency & duration questions below)*



*Frequencies*



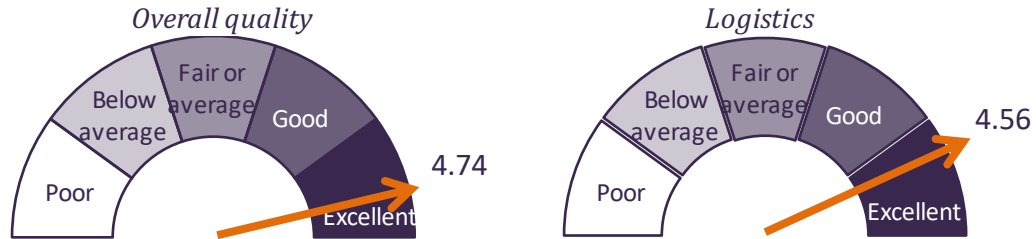
Consistent with prior workshop cohorts, the majority of participants were women. Participants were more experienced as teachers than most other cohorts; over half had have been teaching 6 years or greater. About half of the participants said they had experience with IBL methods as a student and/or in their teaching prior to the workshop. Roughly a third were from minority serving institutions.

Based on frequencies of teaching practices in target courses, participants were already making some efforts to use more student-centered techniques including small group work, class discussions, and students solving problems alone. Participants also reported relatively high frequency of use of non-IBL teaching practices including lecture and instructor presentation of problems.

## Post-Workshop Surveys

*Bulleted lists in this section are from open-ended prompts. They list the most frequent responses and the number of participants (in parentheses) who mentioned each item.*

### Quality of the Workshop



- Logistics positives: breaks helpful (18), organized (9), timing/schedule (9)
- Modeling: general and online-specific (11)
- Logistics negatives: sessions too short/not enough processing time (8)
- Technology positives: general (5), specific tools (4)

### Workshop as a Learning Experience

#### *Best aspects*

- Community & interaction with peers (24)
- Content/information provided (21)
- Facilitators (20)
- Resources provided (19)
- Video session & discussions (9)
- Modeling of IBL techniques: general & online (9)
- Logistics: organization (3), use of technology (3)
- Equity session & emphasis (5)

#### *Needs improvement*

- Timing/length of sessions: more time to process (15)
- More practical emphasis, e.g. course planning (13)
- N/A (10)
- Interaction: more community building, mixing up groups, time for collaboration (9)
- Clearer expectations (4)

Feedback about the workshops was generally positive with some suggestions for specific areas of improvement. The most commonly cited “best” aspect of the workshop was the sense of community and ability to interact with like-minded individuals and faculty from different locations and institutions. Some participants explained that they would have preferred the groups to be mixed up more regularly and to have more time for collaboration. Many comments noted that the facilitators’ knowledge, enthusiasm, and attention to community-building greatly enhanced the workshop experience. One participant stated: “The facilitators enthusiasm to discuss and think and share ideas was/is infectious... It was energizing to be part of these activities.” Participants also appreciated the facilitators’ modeling of IBL, particularly in the online format.

The content of the workshops was commonly described as one of the best features, with participants stating that there was a wealth of information on IBL on a big-picture scale as well examples of specific implementation tools. In terms of practical tools, the resources provided were frequently cited as a helpful feature, including the IBL Toolkit, course materials, and readings. Participants noted that the video sessions likewise provided useful concrete examples of IBL in action. However, 13 participants stated they would have liked more emphasis on the implementation side, including additional time for course planning.

### **Comparative Logistics**

Each of the workshops had their own structure and schedule, including a 3-week mini-course format in the case of the SCIBL workshop. Through comparing comments between workshops, we were able to gather insight into which aspects of the different models’ logistics were appreciated by, or challenging for, participants. One common complaint that has appeared in previous years’ feedback has been feeling that there is too little time to fully process all of the information presented. This appeared in this year’s feedback where participants specifically stated that 45-minute sessions felt too condensed, particularly in the online format where extra time is needed for tasks such as moving participants in and out of breakout groups. One way that teams were able to take the time pressure off this year was by having longer sessions (60-75 minutes), as well as having the content spread out over three weeks in the case of the SCIBL mini-course workshop. Participants also noted that it was beneficial to have consistent breaks, particularly when they were enforced by workshop leaders and did not have other activities bleeding into that time. Along with additional processing time, participants noted that these breaks also provided them with time to take care of other responsibilities at home.

### **Concerns About Implementing IBL**

Participants shared concerns on both pre- and post-workshop surveys. Raised concerns were mentioned on post- but not pre-, Dispelled concerns were mentioned on pre- but not post-, and Lingering were mentioned on both.

<i>Concern (face-to-face)</i>	<i>Raised</i>	<i>Dispelled</i>	<i>Lingering</i>
Resistance/buy-in	5	16	8
Coverage	12	5	7
Confidence/skill in implementing IBL	5	11	5
Time to prepare	3	6	0
Materials	3	3	1
Success of specific students (e.g. cultural differences, shy students)	2	4	1
Creating an equitable classroom	5	0	1
<i>Totals</i>	<u>35</u>	<u>45</u>	<u>23</u>

The highest proportion of concerns were reported after the workshop (“raised” and “lingering”), which is a trend also seen in previous in-person workshops. Some raised concerns in particular may indicate participant learning rather than a fault of the workshop, because as participants gain knowledge, they become more aware of nuances and pitfalls. The greatest “raised” and “lingering” concern was coverage.

A higher number of concerns were dispelled versus lingering, indicating that the workshop was beneficial in alleviating many concerns that participants had prior to attending. Notably, a high number of concerns about personal implementation ability were dispelled after the workshop, which has often been a raised concern in the past as participants begin thinking more about implementation specifics at the workshop. It is also worth noting that this is the first time we are seeing equity appearing as a concern. The fact that the majority of these concerns were “raised” indicates that they were likely a response to the intentional focus on equity at the workshops, which drew attention to equity-related issues participants may encounter in their classrooms.

**Concerns About Implementing IBL Online**

Participants shared concerns on both pre- and post-workshop surveys. Raised concerns were mentioned on post- but not pre-, Dispelled concerns were mentioned on pre- but not post-, and Lingering were mentioned on both.

<i>Concern (online)</i>	<i>Raised</i>	<i>Dispelled</i>	<i>Lingering</i>
Less interaction/sense of community	8	12	7
Technology: instructor use, student access	13	5	3
Student engagement & participation	12	5	3
Translating specific activities into online format: group work, presentations	6	9	2
IBL in asynchronous format	9	1	2
Time	7	2	2
Student buy-in	1	7	0
Lack of experience teaching online	0	6	1
<i>Totals</i>	<u>56</u>	<u>47</u>	<u>20</u>

Given that many courses have been shifted to an online format, we additionally asked participants about their concerns specifically related to teaching online. The highest proportion of these concerns were reported after the workshop (“raised” and “lingering”), with the highest reported raised concerns pertaining to technology, including equal access for all students, and student engagement/participation. As with in-person raised teaching concerns, these may indicate an increase in participants’ awareness of the specific challenges of implementing IBL rather than the workshop not addressing the concerns. Additionally, the raised concern around equal access to technology among students may be related to the emphasis on equity at the workshops.

The greatest number of dispelled concerns related to interacting with students and creating a sense of community online. These concerns were likely dispelled as the workshops themselves modeled effective strategies for building community among the participants.

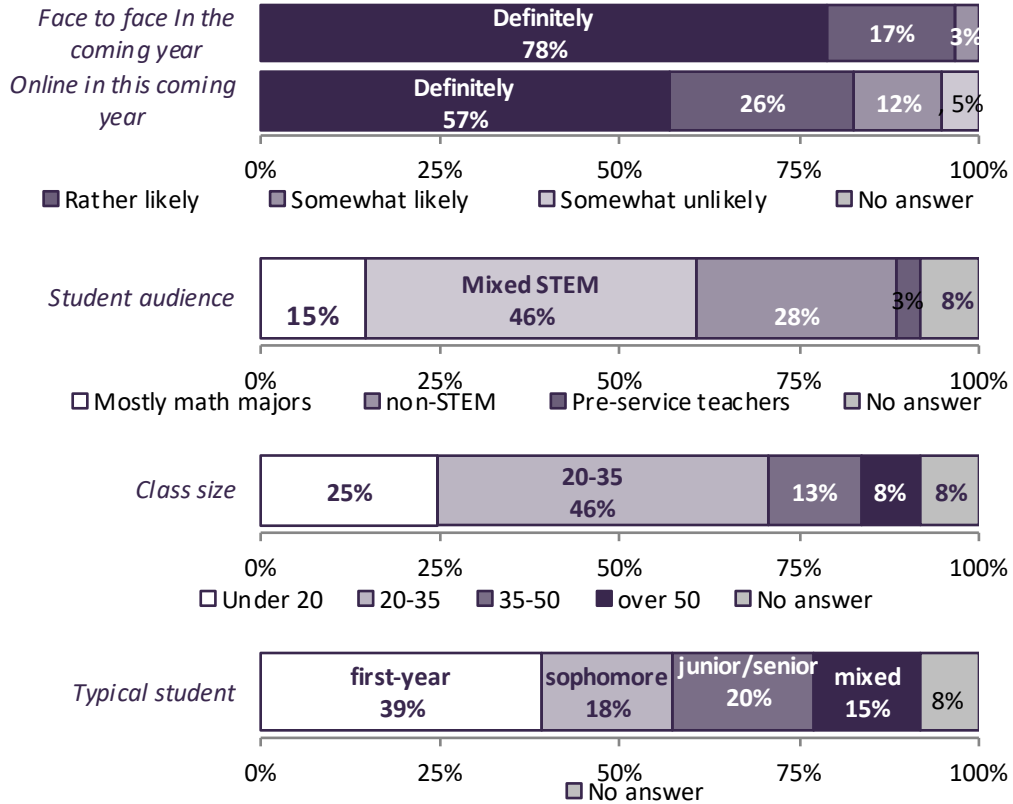


### **Other Ways Teaching Will Be Informed by Workshop**

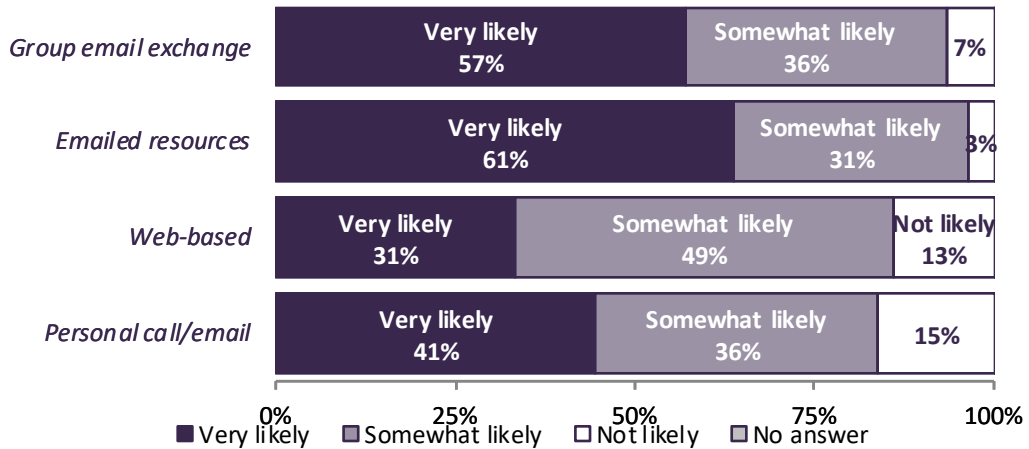
- Attention to equity, creating an inclusive classroom (20)
- Specific classroom techniques (12)
- Emphasizing human side of mathematics instruction (6)
- Focus on students (6)

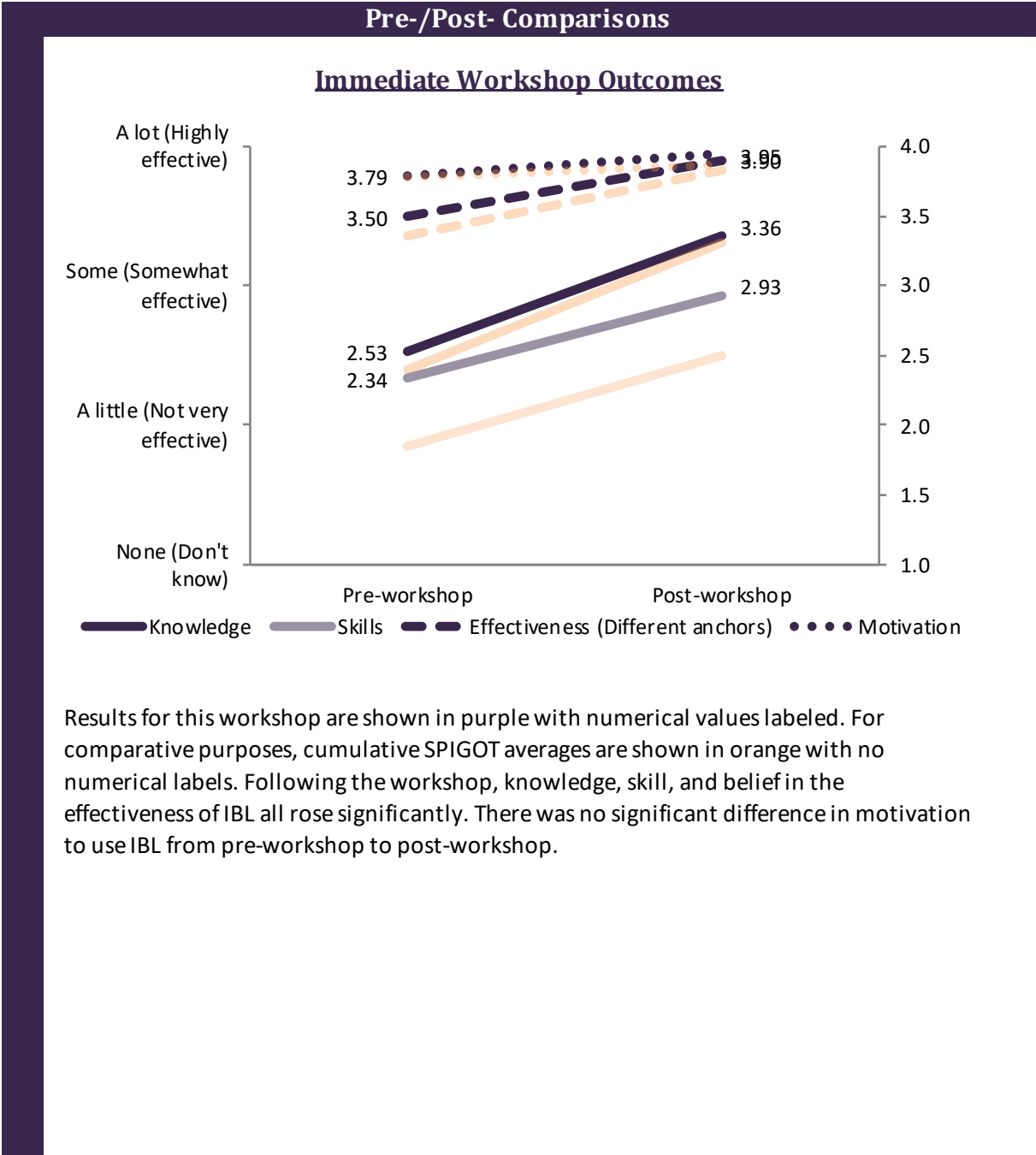
The workshops' emphasis on equity was evident in participants' comments about how their teaching will be informed by the workshop beyond incorporating IBL methods. One participant stated, "I have never paid so much attention to equity before this workshop." The abundance of comments related to equity is a new finding for this year's workshops and appears to reflect the explicit emphasis on equity and inclusion of equity-focused sessions. Timing may have additionally played a role in participants' receptivity to this topic given current events at the time of the workshops, including George Floyd's death in police custody and ensuing public protests over systemic racism in policing. Some participants also noted that the workshop will contribute to their increased awareness of the "human side of mathematics," including building a sense of community and providing a supportive environment, as well as a focus on student thinking and participation in the learning process.

### Plans for Implementing IBL



### Support and Keeping in Touch





Results for this workshop are shown in purple with numerical values labeled. For comparative purposes, cumulative SPIGOT averages are shown in orange with no numerical labels. Following the workshop, knowledge, skill, and belief in the effectiveness of IBL all rose significantly. There was no significant difference in motivation to use IBL from pre-workshop to post-workshop.

## Conclusion

Participant feedback was strongly positive for all three workshops. Participants expressed appreciation for the facilitators' management of the workshop in the online format, and much of this year's feedback is aligned with that of previous in-person workshops, indicating that the facilitators were able to maintain the high quality standards of the workshops in this novel format.

In particular, participants appreciated the thoughtful logistics, intentional community-building, workshop content, and modeling of IBL practices that could be applied to both face-to-face or online teaching. Comments in open-ended feedback also suggest that the online format provided benefits in terms of accessibility for participants managing other responsibilities at home, such as childcare, and by eliminating travel costs.

Participant concerns likewise mirror those reported in in-person workshops, and we do not see any red flags in the concerns that are raised or lingering. This year's feedback additionally showed an increase in comments about equity, which has been a growing feature of the workshops and was most explicitly addressed this summer through the inclusion of equity sessions and facilitators' intentional weaving of equity topics within other strands and activities.

Overall, feedback points to the success of facilitators in translating the workshops to an online format and to potential benefits of an online workshop format going forward.