

# Exploring the Potential of Virtual Office Hours for Online Science Students

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## BACKGROUND

- Online learning opportunities at the high school level have proliferated in recent years, however there is a lot of variation in the design and effectiveness of these programs.
- Virtual office hours (VOH) are one way to provide additional support for online students.
- VOH were implemented for blended learning students at EMERGE homeschool group, with the intent of exploring their potential effectiveness for fully online students at UTHS, where I have taught asynchronous science courses for the past three years.
- My observations of low engagement and low passing rates for UTHS students inspired this project.

## TREATMENT GROUP

- Initial attempts to pilot VOH directly with UTHS students did not have sufficient student participation to proceed. Instead, the treatment group was shifted to fourteen high school students enrolled in blended learning classes taught by Dr. John Graves, at EMERGE, a homeschool alternative in Bozeman, MT.
- Prior to the start of the intervention, these four chemistry students and ten physical science students attended in-person classes once a week, and independently completed assigned work between class sessions. Students had access to an asynchronous discussion forum for use between class sessions, but participation in the forums was low.

## INTERVENTION

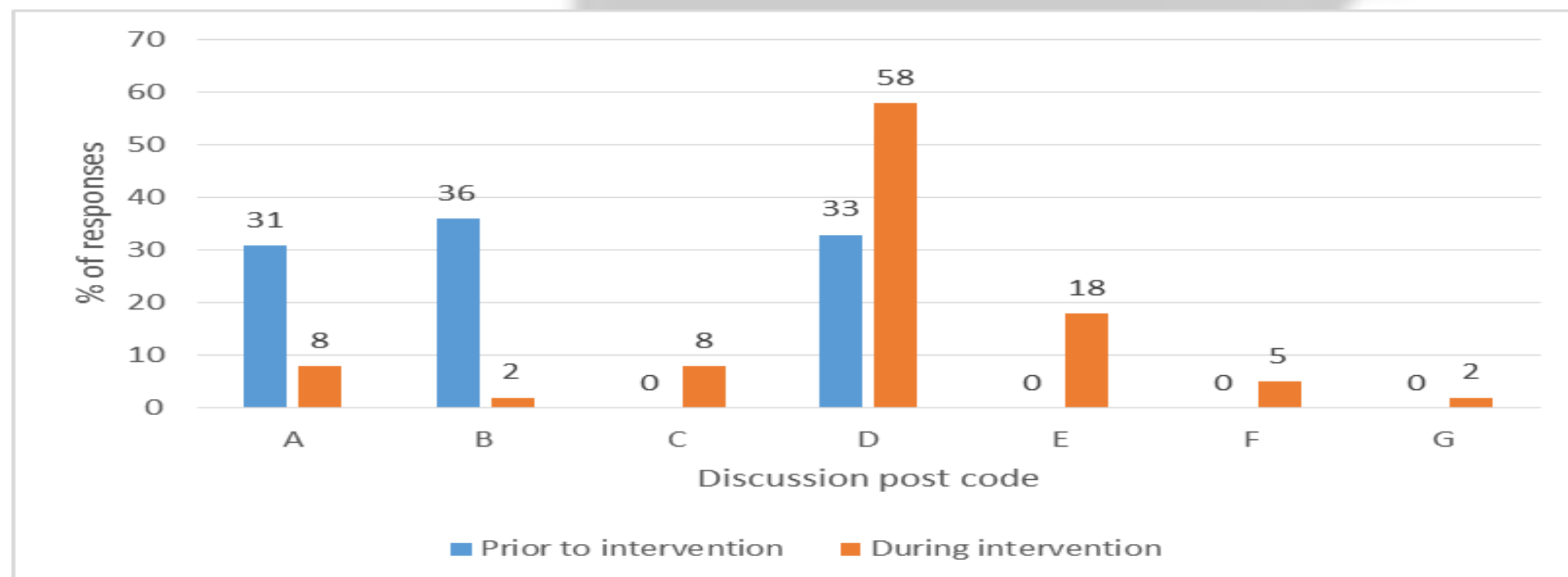
- As a teaching assistant to this class, I hosted weekly VOH for EMERGE students, implemented using Adobe Connect.
- At these optional weekly "webinar" sessions, students could ask questions and receive immediate feedback from myself and from each other.
- In addition, I posted discussion prompts and moderated responses on the asynchronous online forum as a lead up to each week's VOH session

## DATA TRIANGULATION MATRIX

Focus question: Are virtual office hours a meaningful addition to an online or blended learning course?

- How does adding VOH change student's experience of their science course?
- How does adding VOH impact student engagement in their science course?
- What has this project taught me about the conditions needed for successful implementation of VOH?

	Pre and Post survey comparison	Stand-alone post intervention survey questions	Asynchronous discussion artifacts	VOH artifacts	Student interview	Instructor interview	VOH Journal	UTHS student survey
1. How does adding VOH change student's experience of their science course?	x	x			x	x		
2. How does adding VOH impact student engagement in their science course?			x		x	x		
3. What has this project taught me about the conditions needed for successful implementation of VOH?		x	x	x	x	x	x	x



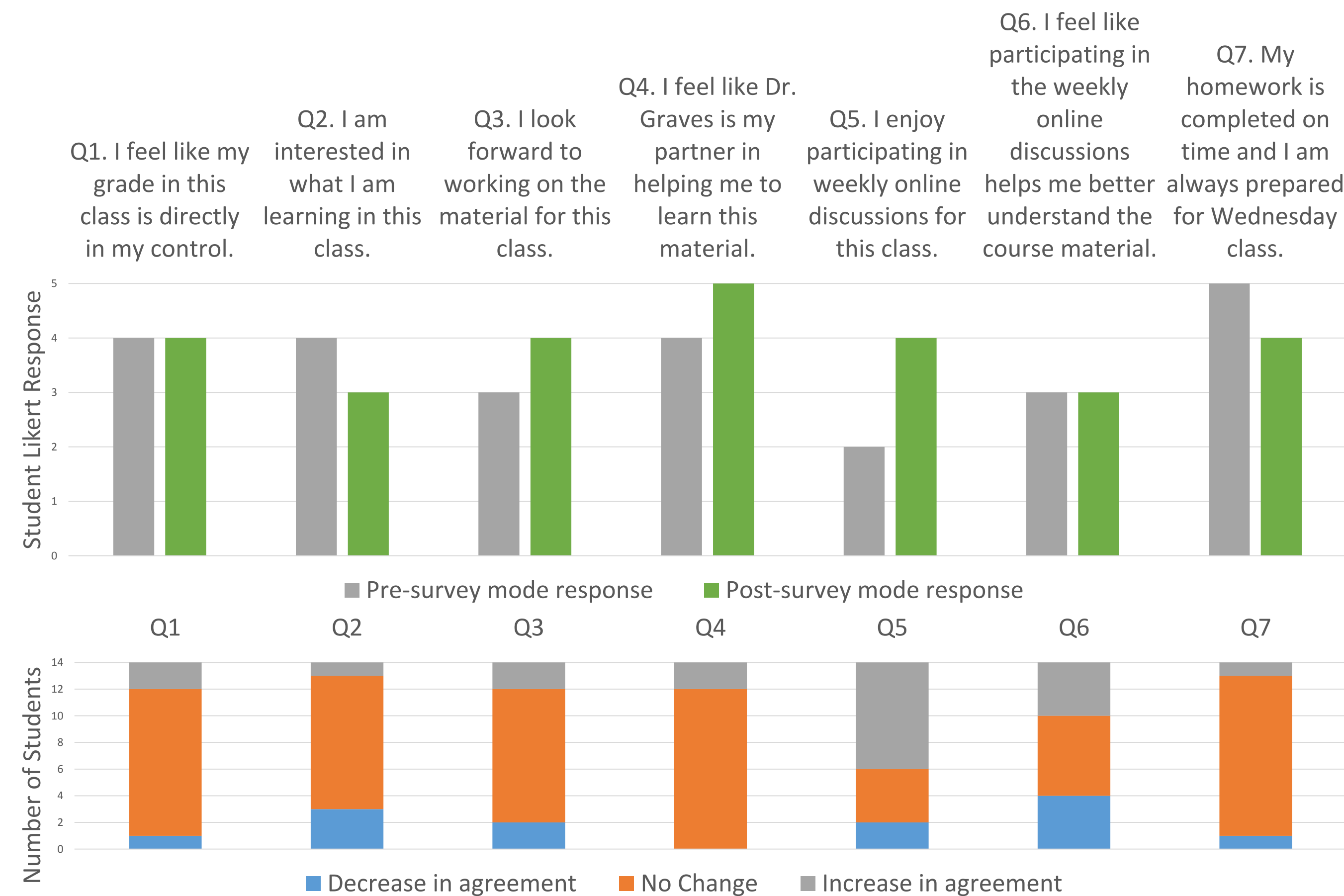
Change in type of discussion post for physical science students prior to vs. during the VOH intervention. A = non-contributing response, B = incomplete response, C = agreement without elaboration, D = direct answer to prompt, E = other post or comment that moves the discussion forward, F = help seeking, G = help providing. (N=10).

## DATA AND ANALYSIS

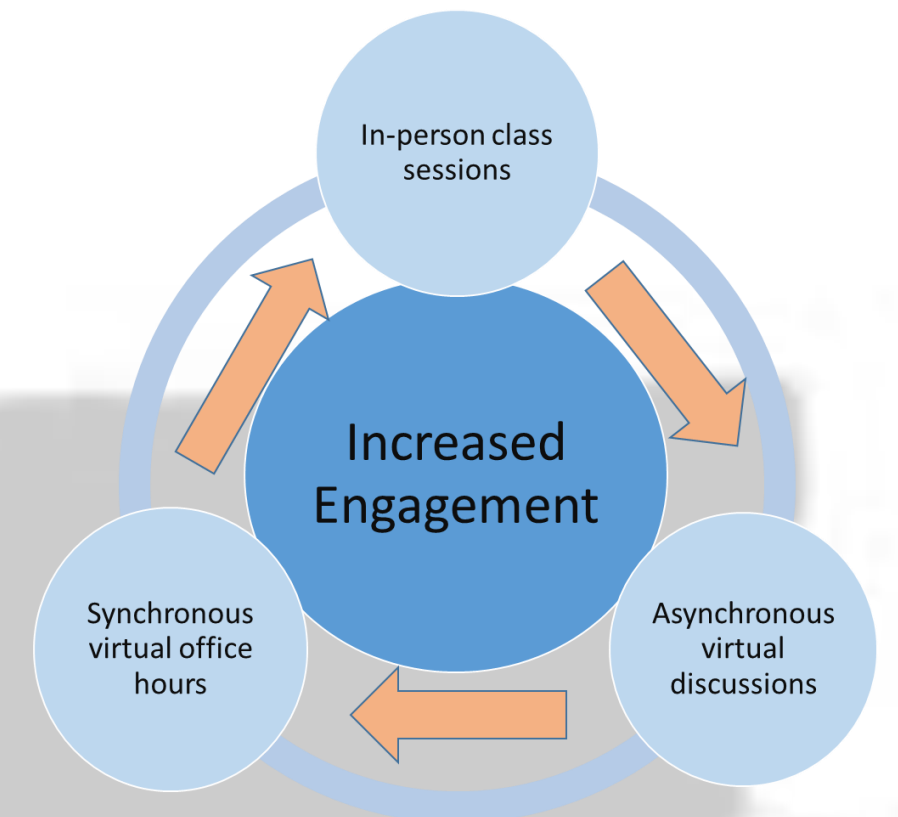
- Survey results did not reflect any significant differences in student experiences of their course pre versus post intervention. However, student and instructor comments reflected an overall favorable response to the addition of VOH to the course.
- An analysis of the asynchronous discussion forums did support that the VOH intervention led to increased engagement. This was also supported by instructor and student comments.
- The remaining data sources revealed that conditions needed for success of a VOH program include selection of an appropriate platform and student education about the benefits of participation. Further factors to consider, depending on the specific goals of the program, include the role of the instructor, supporting asynchronous discussion forums, and the number of students participating in weekly sessions.

## TRENDS IN RESPONSES FOR STUDENT INTERVIEW QUESTIONS

Theme	Number	Example
<b>Role of other students</b>		
Students helped answer my questions or shared different perspectives in the discussions	5	"We were able to help each other." "It was nice to talk with other students about how they understood things."
Students asked questions I hadn't thought of or that I forgot to ask	4	"Sometimes people would say things that I'd never even thought of and that gave me more of a view on the subject we were learning." "It was useful to have other students there to ask questions that maybe you hadn't thought of asking."
<b>Role of discussion threads</b>		
The discussion threads directly led to questions for the webinar, which was helpful	4	"The discussion helped a lot because it got everyone thinking about more things than just the homework that was assigned. And that carried over to the webinar, too."
<b>My role as an outside teacher</b>		
The pictures, examples, or way Heather explained was different from Dr. Graves	4	"Sometimes the way you explained it made more sense to me and sometimes the way Dr. Graves explained it made more sense to me." "I liked the pictures and examples concerning what we're talking about"
<b>Logistic and technical concerns</b>		
The timing of the VOH was hard to fit into my schedule	3	"It was hard to do in the evenings - I would have preferred days or more flexibility"
The chat function was hard to use - I wish we could have just had a live discussion	2	"Typing is annoying"



Comparison of pre and post survey responses to Likert-type questions. 5 = Strongly Agree, 4 = Agree, 3 = Neutral, 2 = Disagree, 1 = Strongly Disagree. Whiskers on the upper graph represent range of responses. (N=14).



## INTERPRETATION AND CONCLUSION

Overall, VOH were a meaningful addition to the blended learning courses at EMERGE, and likely could be meaningful with my UTHS students. Of particular note was the cyclical way that the in-person class sessions, asynchronous virtual discussions and synchronous VOH sessions together led to increased engagement. In an online-only setting, allowing for more teacher-student and student-student contact through the use of group VOH sessions could also lead to increased engagement and possibly improved student understanding.