

# Breaking Grounds: A Qualitative Analysis of Online Tutoring Sessions

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## ABSTRACT

The Deaf and Hard of Hearing Virtual Academic Community (DHHVAC) provides support for online tutoring sessions. One of the project's goals is make sure that participating students are able to access academic resources without barriers such as time, distance, location, and communication. Access to online tutoring will help students to maintain their academic progress and move on to become professionals in STEM fields. This research is a qualitative analysis of recorded online tutoring sessions focusing on communication, content, and technical issues. The DHHVAC has supported more than 160 tutoring sessions with 35 participants averaging 60 minutes in length. This project is a preliminary analysis of 12 recorded tutoring sessions focusing on STEM topics (Focused on mathematics, biotechnology, chemistry, physics, etc) . In the future, our objectives are to expand tutoring topics offered, recruit more tutors, and adapt to use new video conference technologies that may be more user friendly. Accessible technology provides new and innovative ways to meet the academic needs of deaf and hard of hearing students, our ongoing data analysis will discover more about what happens during these sessions and how they can be improved in the future.

## METHODS

A research group including both students and DHHVAC staff is reviewing excerpts from recorded tutoring sessions. Videos are coded for communication strategy, conversation content, materials used in the tutoring session, and technical issues. Examples of the codes are shown in Table 1 below.

Table 1. Synchronous Tutoring Video Content

Content Trend	Student	Tutor	Code	Example
Communication Style	ASL	Sign Language; Facial Expression	LISL, LAQ	Student signs "What do you mean?"
Conversation Content	Providing Information or Expressing Understanding	Providing Information or Expressing Understanding	LISL, LDEC	Student signs "Oh, I understand now!"
Materials Used	Hardcopy homework	Hardcopy homework	LWR	Student is looking away from webcam to read textbook.

## CONCLUSIONS

The DHHVAC's objectives are to help deaf and hard of hearing students overcome barriers in STEM education, one of those barriers is access to qualified tutors. Preliminary research shows that concerns related to technology failure or lack of contact did not impact the overall quality of tutoring sessions that were recorded. However, continuing research is needed. The DHHVAC staff hope to continue to research asynchronous and synchronous online tutoring to improve the online academic experience for deaf and hard of hearing students.

Given that the DHHVAC is a research project with a private community of members, there are limitations related to participation. As a whole, the DHHVAC hopes to continue to collaborate with another tutor programs (i.e. NTID Learning Center, academic departments, and other campus partners) to recruit more tutors and students to join our program. We would like to provide more options for participants in regards to content, availability, and technology used.

## RESULTS

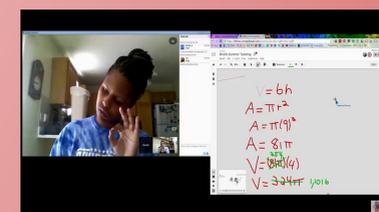
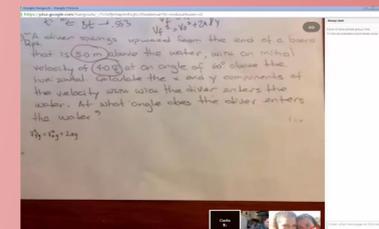
Students and their tutors have engaged in 160 sessions of 15 minutes-3 hours in length (average 63 minutes). The 12 videos analyzed focused on Physics, Mathematics, and Biochemistry. The average length of videos analyzed is 42 seconds and the total length tutoring content coded is 8 minutes.

Twelve videos have been coded thus far, representing approximately 35% of all the video excerpts. To date, the analysis has identified the following trends:

- **Communication style:** Students used ASL the most while the tutors showed a preference for Simultaneous Communication and spoken language with similar frequency. Both groups of participants also used facial expressions without ASL.
- **Conversation content:** For both students and tutors, the primary conversation content focuses on providing information or expressing understanding about the topic being discussed.
- **Materials used:** While tutoring may utilize a wide variety of materials, the sessions analyzed thus far have predominantly used hardcopy homework documents. Students have also used text-based chat to discuss tutoring issues.
- **Technology issues:** Out of the 12 videos analyzed, observation was done for technical issues. There is one documented technical problem during a conversation with between the tutor and student, the tutor sees the student frozen on the webcam. It is unclear if the tutor or student's equipment causes the problem.

## BACKGROUND

Online support for academic subjects is widely available for the general postsecondary student population in both asynchronous formats (e.g., [1]) and synchronous systems (e.g., [2]; [3]; [4]). Academic support is especially valuable for postsecondary students who are deaf or hard of hearing because many of these students arrive at college or university underprepared for their coursework [5];[6]. However, many of the generic resources are not accessible for students who are deaf or hard of hearing (DHH) because generic online resources do not match DHH students' communication preferences. One solution for making tutoring more available to students is to provide it online. Until recently, most research on online tutoring pertained to satisfaction studies [7]. Studies of what actually happens during tutoring sessions are much less common (e.g., [8]). This study is meant to examine what takes place during online tutoring sessions for science, technology, engineering and math (STEM) courses with DHH students and their tutors.



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