

Thematic Notes From the PEPNet Focus Groups

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Question # 1: What are the barriers to education in STEM by students who are deaf and hard of hearing?

Interpreters

- Lack of qualified interpreters, especially in rural areas
- Lack of qualified interpreters who are also familiar with the subject matter, concepts and terminology in STEM courses (i.e. have background in STEM themselves)
- Lack of standardization and consistency in use of signs for STEM courses (which is exacerbated when there are multiple interpreters for the same course or when interpreters are rotated every 20 minutes as often occurs in remote interpreting)
- Lack of access to the texts and other materials for the course.
- Need training, resources and support in STEM areas
- So much visual information is used in the classroom, it is hard for students to follow the interpreter (or captionist) and view the media at the same time. (Note: this is also an issue for Instructors who may fail to wait while students shift from the interpreter to the visual material). Also it would help to have the interpreters near the visual to minimize shift of eye gaze (similarly have captions displayed near visual)
- Idea- open source model for developing new signs—people could post or contribute or seek the site for signs.
- Student needs to work in partnership with interpreter(s)

Captioning

- Lack of familiarity with the subject matter, concepts, and terminology in STEM courses.
- Lack of ability of most captioning services to capture formulas, equations and other symbols that are not traditional text.
- Lack of standardization of vocabulary for all captioning programs.
- Lack of access to the texts and other materials for the course.
- Need training, resources and support in STEM areas
- Student needs to work in partnership with captionist(s)

Instructors

- Instructor attitudes are often a barrier (even with a perfect interpreter and/or captionist)
- May be unwilling to make adaptations in the class
- May be resistant to trying different teaching strategies
- May be unaware of principles of universal design in education

Pre-college preparation

- Students often not exposed to quality STEM education in elementary, middle or high school (in both separate or mainstream programs). As a result, many do not make it into postsecondary education, or if they do attend college, they are less likely to enter or succeed in the challenging STEM majors.
- Too much emphasis in earlier education on speech, literacy and language skills resulting in reduced exposure to content work, especially in STEM. Result is lack of foundation for further study in these areas.
- Relatedly, they may not even be aware of the possibilities for careers in STEM areas.
- Question raised about whether we know how many students are qualified for higher education in STEM areas, and whether we have breakdowns by gender, ethnicity, etc.
- Promote camps for younger students (i.e. Tech Girls) to develop interest and skill in STEM areas.

Internships

- Access issues may be worse when out in the field doing an internship or practicum; harder to find interpreters in these settings, and to convince the internship company to pay for it.

Accessible media

- Often media is inaccessible... not captioned

Inclusion of both deaf and hard of hearing and with other disability

- Need to be sure that materials are equally accessible for hard of hearing and oral deaf students.
- Need to be sure that there is also access for deaf-blind students
- Hard of hearing students may be unaware of what is available to them, or unwilling to self-identify
- Hard of hearing students will not use something that has the “deaf” label.

Question # 2: What do you see as the benefits of a cyberinfrastructure to support deaf and hard of hearing students in STEM and what would be the most important parts of such a structure?

Social Networking

- Some existing Internet models like one that exists in medical areas where students who are preparing to be a nurse or doctor can meet to discuss challenges.
- Will need different forums to draw in deaf versus hard of hearing students, cued speech, etc.

- Need a universal design
- Need to keep up with the changes in Internet options... constantly evolving. We don't want to create something that will not attract young adults. Need to build in the potential for the product to evolve.
- Create links to existing social networking tools like Facebook
- Mentoring as a resource... may include a list of deaf mentors in various fields to advise with job seeking, professionalism, etc.
- Social network, emotional support is important.
- Must be designed with input from students to be sure it is attractive for them.

Remote interpreting and captioning

- Will the service be free to the student/college? Big issue because if the school will have to pay for it they may not want to participate; would prefer to use a cheaper interpreter or staff interpreters (even if they aren't as qualified or skilled in the content area)
- Problem with remote interpreting of turnover every 20 minutes—adds to inconsistency issue
- A possible resource for interpreters who can use it to help them improve in STEM interpreting... a repository for signs (noted that PEPNet has something like that “Closer look”)
- Students could also look up signs as well on the site as well a create and demonstrate signs they use already
- Sign database should be flexible so that it can change as new signs are developed

Tutoring and other support

- Students will prefer direct communication for tutoring... maybe peer mentoring from a deaf student who has been through the program and communicate directly with student.
- Have access to existing captioned videos on various core STEM topics and develop new videos where needed. Include an option to turn on interpreting for the video if preferred. An online video library. Make available to instructors as well to use in their classes.
- Information on how to work with instructors to overcome attitudinal barriers and create more awareness

Partnerships with other groups (overarching theme)

- Partner with National Interpreter Consortium on sign development or STEM certification
- Partner with AG Bell and SHHH to ensure that there is info and resources for hard of hearing or oral students
- Partner with deaf professional groups like Deaf Lawyers list serv and the American Association of Medical Professionals with Hearing Loss for mentoring and networking

Question # 4: What are the challenges with developing this kind of online cyberinfrastructure?

Accessibility

- Making sure the materials are accessible to users
- Rural students may not have internet access
- Be inclusive (not just a signing focus but inclusive of all forms of communication used by deaf and hard of hearing students)
- Need to partner with a range of organizations, including AGBell and HLAA (formally SHHH)

Infrastructure

- Firewalls at some postsecondary institutions
- Lack of internet at schools
- Some schools don't have the bandwidth to support internet signing
- Many students may not have access to internet at home, especially in rural areas

Usage

- Will need monitoring... if it is open it can get out of control. Some students will not use appropriately... not mature enough

Question # 5: Do you know of any postsecondary school that may have significant numbers of deaf and hard of hearing students (as potential partners)?

Schools

Clemson

University of Maine

University of Michigan

University of Illinois

University of Washington (Seattle)

CSUN

University of Wisconsin (Madison)

University of Minnesota (Twin Cities campus)

University of Arizona

U Cal Berkley

UC Davis

Michigan State University

Ohio State

Other comments:

Disability services may not really be able to tell you how many D/HH students they have. Maybe use the college guide to locate schools.