

Testing the Concept of a Virtual Alliance for Postsecondary Level STEM Students who are Deaf and Hard-of-Hearing

Summary of PEPNet Focus groups: 10/6/2009 and 10/7/2009

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Introduction

Seventeen individuals participated in the Focus groups held in Boulder Colorado on October 6 and 7, 2009. Involved in the sessions were 11 outreach specialists, three administrators, two technology specialists, and one accounting specialist. Six of the attendees were deaf or hard of hearing, two were male, and two were ethnic minorities. The sessions were scheduled in two, two hour time blocks and took nearly the entire scheduled time.

All the sessions were recorded using CART with interpreters voicing for individuals who used sign language and no voice. Transcripts of the focus groups are attached to this summary.

Prior to the focus groups, a PowerPoint presentation outlined the purpose of the project to create a virtual alliance for postsecondary level STEM students who are deaf and hard of hearing. During this presentation a list of questions was shared with the attendees to initiate thought about the focus group.

- ▶ What are the barriers to education in STEM by students who are deaf and hard of hearing?
- ▶ What do you feel are the benefits associated with creating a cyberinfrastructure to support STEM students who are deaf or hard of hearing?
- ▶ Do you feel a virtual cyberinfrastructure could be created to provide:
 - Social networking?
 - Remote interpreting and captioning?
 - Tutoring and other support?
- ▶ What do you believe are the most significant challenges associated with creating a cyberinfrastructure to support STEM postsecondary students who are deaf or hard of hearing?
- ▶ What features would you like to see incorporated in a cyberinfrastructure system? What features would be of benefit to you?
- ▶ Do you know of any colleges or universities in your states that might have significant numbers of STEM students who are deaf or hard of hearing?
- ▶ Do you have any additional comments that will aid in developing this proposal?

These questions acted as the stimulus that guided the discussion in the focus groups.

Generally, the results of the focus groups can be summarized in four areas: barriers to participation in STEM majors, benefits of having a cyberinfrastructure and its components, challenges to developing such a structure, developing partnerships as part of the project, and

suggestions for related web-based services, and participant's input concerning schools that might have significant numbers of students who are deaf or hard of hearing in STEM majors.

Overall, participants were very supportive of developing a cyberinfrastructure for use by STEM students who are deaf or hard of hearing.

BECAUSE WE DO NOT HAVE VERY MANY STUDENTS WHO ARE DEAF OR HARD OF HEARING ENROLLED IN SCIENCE AND TECHNOLOGY AND MATH AND ENGINEERING OR AS MANY AS WE WOULD LIKE TO HAVE THAT A SUCCESSFUL CYBER INFRASTRUCTURE THAT ENHANCES THE OPPORTUNITY TO SUCCEED IN THOSE ACADEMIC AREAS WOULD BE VERY BENEFICIAL

Barriers

The barrier most identified was access to information presented in the classroom. Even with interpreters and speech-to-text services available to many students, barriers exist for students in STEM majors because interpreters and speech-to-text operators often do not know the vocabulary of the subject area in STEM majors.

I'M NOT A NERD GEEK BUT I THINK IT'S ALMOST IMPOSSIBLE FOR AN INTERPRETER TO COME INTO LIKE A HIGH LEVEL GRADUATE STATISTICS COURSE OR A HIGH LEVEL MATH COURSE. YOU CAN'T INTERPRET YOUR TRANSLITERATING SO IF YOU DON'T UNDERSTAND THE SUBJECT MATTER, YOU KNOW, YOU CAN'T INTERPRET IT FOR THE STUDENT TO UNDERSTAND THE CONCEPT. I THINK THAT'S ONE OF THE BARRIERS.

WHEN I LOOK BACK AT MY COLLEGE YEARS WITH MY MAJOR IN SCIENCE, I, AS A DEAF PERSON, EXPERIENCED CHALLENGES BECAUSE IT WAS HARD TO FIND AN INTERPRETER TO SIGN THOSE TECHNICAL SCIENCE CONCEPTS. MANY INTERPRETERS, YOU KNOW, OH, I DON'T KNOW THE TECHNICAL SIGNS FOR SCIENCE. SO IT WAS VERY DIFFICULT FOR ME AS A DEAF PERSON AND I HAD TO CONSTANTLY BE GIVING THEM THE SIGNS AND A LOT —— THERE WAS A LOT OF FINGER SPELLING AND SO THAT IS THE CHALLENGE.

Another barrier was having access services available to students who are involved in practicums and internships.

WHEN THE STUDENTS FINISH THEIR STUDIES, THEY OFTEN NEED TO GO OUT AND FIND A PRACTICUM, AN INTERNSHIP AND OFTEN THAT IS WHERE THEY FACE A LOT OF BARRIERS. ... IT'S HARD FOR THEM TO CONTINUE THEIR PROFESSIONAL TRAINING WITHOUT SERVICES. THAT'S A BIG CHALLENGE.

A number of people also noted that significant barriers exist in preparation at the high school level. Many students who are deaf or hard of hearing do not have exposure to information about STEM careers and do not have access to STEM courses that would prepare them for entry into college STEM majors.

MANY STUDENTS WHO COULD BE INTERESTED IN STEM CLASSES MIGHT NOT BE AWARE OF THOSE CAREERS OR — BECAUSE OF LIMITED CLASS OPTIONS THAT DEAF SCHOOLS CAN'T OFFER.

Benefits

Interpreters and speech-to-text operators could have access to vocabulary of the courses they are supporting in a central location. It was also suggested that these “dictionaries” could be “open source” so that as new vocabulary came on line or new signs were developed they could be added. This open source approach would allow for dynamic evolution of the dictionaries that support interpreters and speech-to-text operators.

There needs to be standardization of signs/dictionaries to support STEM courses.

YEAH, PREP MATERIAL, TRAINING BEFORE THEY GET INTO THE CLASS SO THEY ARE READY TO INTERPRETER WHEN THEY SET FOOT INTO THE CLASSROOM.

SO THE OTHER PART OF THE PROBLEM IS THAT A NEW RESOURCE NEEDS TO BE CREATED TO ADDRESS WHAT ARE THE ACCEPTABLE TECHNICAL SIGNS FROM THE DEAF STUDENTS, FROM THE DEAF ADULTS WHO ARE IN THOSE FIELDS. WE NEED TO GATHER THAT INFORMATION AND CREATE A RESOURCE THAT WILL ADDRESS THAT NEED.

A website to support STEM students could be beneficial to supporting interaction among students in these majors.

I'M GOING TO STATE THE OBVIOUS BUT THIS IS OPEN SOURCE AND IT'S FREE, WHICH MEANS THAT THERE SHOULD BE NO HESITANCY ABOUT ANYBODY THAT IS AWARE OF IT REFERRING STUDENTS TO PARTICIPATE IN THIS BECAUSE IT'S NOT GOING TO COST THE SCHOOLS ANYTHING. OR THE INDIVIDUALS ANYTHING.

THEY LIKE FACEBOOK BETTER THAN ME (LAUGHTER) IN OTHER WORDS, IT'S VERY POPULAR WITH THE DEAF COMMUNITY AND WITH A LOT OF PEOPLE, IN GENERAL. SO THAT TYPE OF FORMAT, THAT TYPE OF SOCIAL NETWORKING, IF YOU WILL, I THINK WOULD BE SUCCESSFUL WITH A UNIVERSAL DESIGN

Challenges

Make the site desirable and accessible to students with all levels of hearing loss. This was emphasized by a number of respondents. Specifically, the respondents emphasized not focusing only on students who use American Sign Language but students with various communication preferences

HARD OF HEARING SUDENTS DO NOT IDENTIFY THEMSELVES AND THEY MAY BE IN THESE PROGRAMS AND STRUGGLING. THEY MAY NOT HAVE ACCEPTED HEARING

LOSS. THEY MAY HAVE RECENT HEARING LOSS, THEY MAY HAVE PROGRESSIVE HEARING LOSS. THEY OFTEN DON'T IDENTIFY THEMSELVES. THEY DON'T KNOW WHAT IS AVAILABLE TO THEM. THEY DON'T WANT TO STAND OUT BY ASKING FOR ANY OF THOSE THINGS. IT'S A HUGE PROBLEM.

I SHOULD SAY THAT MANY HARD OF HEARING STUDENTS ARE NOT GOING TO PARTICIPATE WITH SOMETHING THAT IS LABELED DEAF. THEY ARE NOT GOING TO DO IT. AND SO — BECAUSE THEY DON'T VIEW THEMSELVES AS DEAF. THEY DON'T VIEW THEMSELVES AS EVEN HAVING A DISABILITY. THEY HAVE A HEARING LOSS. THAT'S IT. SO I THINK THAT IT WOULD BE IMPORTANT AND ALSO SOME OF THE ISSUES FOR HARD OF HEARING AND DEAF, SOME ARE THE SAME, YES, BUT MANY, MANY ARE DIFFERENT, ESPECIALLY WITH LANGUAGE BARRIERS AND THE LANGUAGE AND COMMUNICATION PROBLEMS.

WHAT I AM KIND OF ENVISIONING WOULD BE LIKE TO HAVE ... A HOME BASE AND THEN TO HAVE PORTALS, SO YOU WOULD HAVE A CUED SPEECH HOME PAGE THAT YOU GO IN. SO ALL USERS OF CUED SPEECH WHO ARE IN ENGINEERING ARE ABLE TO INTERACT TOGETHER. IF THEY WANT TO GO ON IN DEEPER AND TALK TO OTHER ORAL DEAF THAT ARE ENGINEERING, FINE, THEY CAN, OR TO ASL DEAF WHO ARE IN ENGINEERING, THEY CAN. BUT IF THEY GO INTO A HOME PLACE — A CUED SPEECH STUDENT GOES INTO A HOME PLACE WITH ASL, ORAL, SIGNED ENGLISH, WHATEVER, THEY ARE GOING TO — BECAUSE IT'S NOT THEIR IDENTITY.

SO ONE OF THE THINGS THAT MAYBE THIS COULD DO IS TO DEVELOP SHORT BUT SPECIFIC WEB OR VIDEO CLIPS THAT IS SPECIFIC — THAT ARE OPEN CAPTIONED, BUT ARE VERY VISUAL AND HAVE A MODE TO TURN ON INTERPRETING OR NOT. DON'T HAVE IT AUTOMATICALLY THERE. HAVE CAPTIONING AUTOMATICALLY THERE FOR ALL, YES, BUT INTERPRETING, ADD OR NOT. DON'T HAVE — I WOULD ADVISE THAT ANY VIDEO THAT IS ON IT NOT TO AUTOMATICALLY HAVE AN INTERPRETER. TO BE AN OPTION.

Technical issues will need to be considered. Issues such as sufficient bandwidth and immunity from firewalls must be considered in the development.

THE OTHER IS IF YOU GET ACCESS TO THAT KIND OF SITE, MANY COLLEGES DON'T HAVE THE SUFFICIENT BANDWIDTH TO SUPPORT SOMETHING LIKE THE VIDEO SIGNING. I KNOW AT UALR, WE REALLY STRUGGLE TO HAVE THE BANDWIDTH INCREASED JUST SO THAT WE CAN USE VIDEO PHONES, BUT IT COSTS MONEY TO DO THAT AND MANY COLLEGES CAN'T AFFORD TO DO IT.

I MEAN IT'S A BIG ISSUE AND STUDENTS MAY HAVE IT [access] ON CAMPUS, BUT THEY CAN'T GET IT AT THEIR HOME BECAUSE THEY LIVE IN A VERY RURAL AREA IN THE COUNTRY, THERE'S NO ACCESS TO CELL PHONES OR INTERNET IF THEY COULD EVEN AFFORD TO PAY FOR INTERNET SERVICES IN THEIR HOME.

ONE IS THE FIREWALLS ON CAMPUS. MANY INSTITUTIONS BLOCK FACEBOOK AND OTHER PROGRAMS LIKE THAT SO YOU HAVE TO KIND OF NEGOTIATE AND WORK WITH COMPUTING SERVICES TO BE ABLE TO ALLOW ACCESS TO THOSE KINDS OF

SITES.

It was also suggested that direct communication should be used wherever possible since students prefer this mode whenever possible.

ON THE TUTORING SIDE FOR THE LOW INCIDENCE POPULATION, OFTENTIMES WHAT I HEAR FROM DEAF INDIVIDUALS IS THAT THEY WOULD PREFER DIRECT COMMUNICATION. SO IF IT COULD BE FROM, SAY, A DEAF STUDENT THAT HAS ALREADY GONE THROUGH THAT PROGRAM OR, YOU KNOW, KIND OF A MASTER MENTOR, THEN WHERE THEY CAN PROVIDE THE DIRECT COMMUNICATION PROBABLY WOULD BE MORE IDEAL.

Another challenge with developing a cyber network would be establishing a financial structure for the services provided to users. Questions were raised concerning the cost of the services provided through the network, and who would pay for the services.

BUT I THINK THEY HAVE TO CONSIDER THE FINANCIAL ISSUES WHEN THEY ARE PLANNING BECAUSE MY EXPERIENCE, EVEN ENCOURAGING STUDENTS IN RURAL — OR COLLEGES IN RURAL AREAS TO USE REMOTE SERVICES, THEY OFTEN PREFER TO JUST GET BY WITH SOME CHEAP ALTERNATIVE IN THEIR AREA. SO I THINK THAT'S GOING TO BE AN ISSUE THAT — I MEAN, IT'S NICE TO SET UP THE SERVICE, BUT THAT FINANCIAL ISSUE WILL BE BIG.

AND RELATED TO THAT POINT IS FUNDING FOR THOSE SUPPORT SERVICES. SO INSTITUTIONS HAVE TROUBLE ENOUGH TRYING TO PAY FOR THE — YOU KNOW, THE ONE SERVICE. THEN WHEN THEY ARE GOING TO ADD TWO SERVICES, CART AND INTERPRETING, SO FUNDING IS AN ISSUE, TOO.

Partnerships

Participants suggested that the project partner with organizations that represent the full spectrum of the deaf and hard of hearing community. It was suggested that AG BELL and HLAA be involved in the planning and development of the system. These organizations can be helpful when reaching out to students especially those who are not ASL users.

I THINK THAT'S THE GOOD POINT IS NOT WORKING IN ISOLATION AND INVOLVING MORE EXPERTISE AND ORGANIZATIONS AND THAT WOULD MAKE A GOOD STRONG PROPOSAL.

Also, it was suggested that students be involved in the development of the system.

I WOULD LIKE TO RECOMMEND THAT THEY CONTACT AND PICK OUT SOME STUDENTS AND GET FEEDBACK FROM THE KID THAT IS SITTING IN THE CLASSROOM. GET IT STRAIGHT FROM THE HORSE'S MOUTH.

DOES THE GRANT HAVE ENOUGH FEEDBACK FROM STUDENTS, NOT US, FROM STUDENTS TO DESIGN IT IN A WAY TO MAKE IT ATTRACTIVE FOR THEM.

Schools with STEM Students

The following schools were suggested as possibly having a “significant” number of students who are deaf or hard of hearing in STEM majors.

University of Washington
California State University at Northridge
University of Wisconsin Madison
University of Minnesota Minneapolis
University of Arkansas at Little Rock
University of Michigan
Michigan State University
Louisiana State University
University of Illinois

Key issues

- Funding is an issue for schools providing services
- Need to provide students choices of service
- Should think beyond the classroom and think about support for students doing practicums and internships.
- Provide information to promoting careers in STEM
- Gender and ethnicity issues must be considered
- Mentoring should be an important part of design
- Develop an open source sign and speech-to-text dictionary
- Online chat with others in STEM majors
- The system should promote direct communication
- Access for deaf and blind students
- Must get deaf students involved in the design of the system
 - Deaf Lawyers list serve
 - American Medical Professionals
- Must find ways to get beyond university firewalls
- Insure that system is sensitive to communication styles of all STEM students who are deaf or hard of hearing.
- Incorporate concepts of Universal Design throughout the system.
- Issue of payment for services should be thought of during the design .