A Virtual Academic Community for Deaf and Hard-of-Hearing Students in STEM

Lisa B. Elliot & Benjamin Rubin
Rochester Institute of Technology

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Overview

- Who we are
- Rationale for the project
- Review of model components
- Academic community activities
- Recruiting strategies
- Monitoring community usage
- Future activities
- Q & A

Who We Are

- Deaf STEM Community Alliance
  - Only Alliance targeted to a single disability

- Supported by the National Science Foundation, HRD #1127955

- 3-5 year project (Sept 2011- Aug 2016)
  - Now in our 3rd year

Campus Partners

RIT is the lead institution for this project, with Camden County College and Cornell University as partners.

Project Rationale

- Participation gap in STEM for students who are deaf or hard of hearing (D/HH)
    - National average graduation rate for D/HH bachelor's degree: 23% (vs. 73% at RIT/NTID) (all subjects)
    - Between 1997-2006, 420 out of 265,790 (~.2%) of new STEM PhDs were D/HH
    - Employment differentials in STEM:
        - Hearing 17.9% v 15.5% D/HH
        - Hearing in higher-earning STEM sectors than D/HH

- Contributing barriers:
    - Student preparation (STEM basic skills, concepts)
    - Socialization (peers, role models)
    - Accessible media

Project Rationale

- Solution: Deaf STEM Community Alliance
  - Student preparation
    - Remote tutoring
    - Remote captioning
    - Remote interpreting
  - Socialization
    - Remote mentoring
    - Peer interaction
  - Accessible media
    - Curated collection of STEM resources

Goal and Objectives

- Goal:

  Create a *model* virtual academic community to increase the graduation rates of postsecondary D/HH STEM majors in the long term

  - Iterative and incremental (Cockburn, 2008)
    - Iterative – testing what works and revising what doesn't
    - Incremental – building model in stages instead of all at once
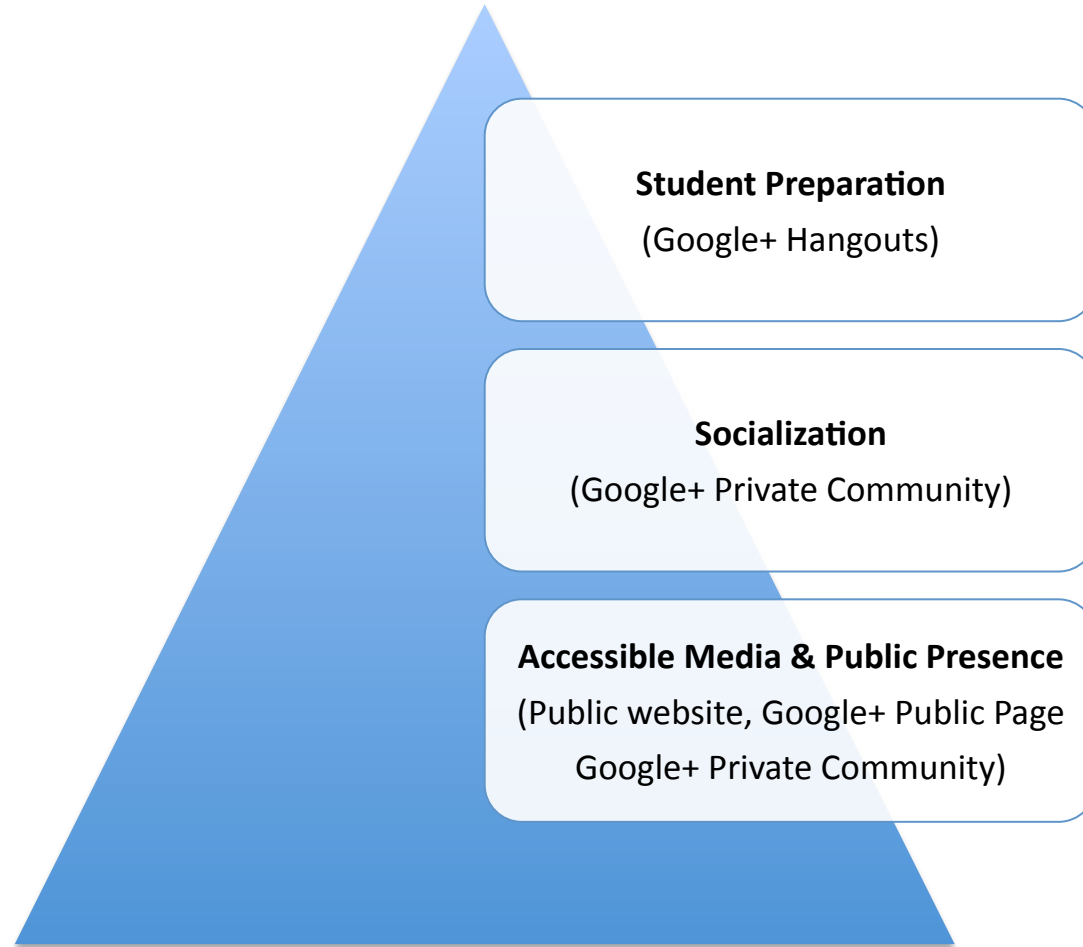
Goal and Objectives

- Objectives
    - Document and disseminate a description of the process of creating a model VAC for replication
    - Increase the GPAs and retention rates of D/HH students in STEM majors

DHHVAC Model Components

Student Preparation
(Google+ Hangouts)

Socialization
(Google+ Private Community)

Accessible Media & Public Presence
(Public website, Google+ Public Page
Google+ Private Community)

Student Preparation Elements

- Remote Tutoring (Years 1-5)

- Remote Captioning (Years 4-5)

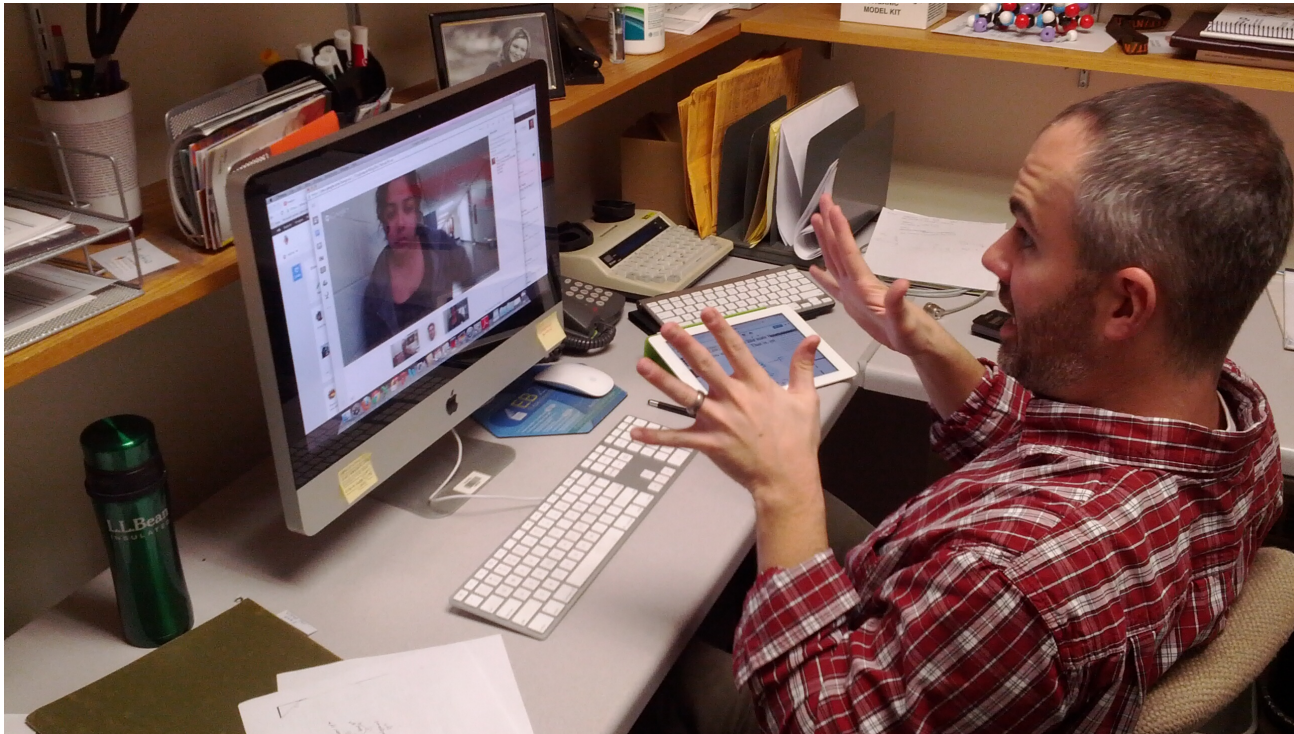- Remote Interpreting (Years 4-5)

Remote Tutoring

Photo of student receiving tutoring. Student is seen on computer screen, tutoring professor pictured sitting at his desk in front of the computer.

Tutoring Models

- RIT Faculty/RIT Students:
  - (RIT-RIT) Faculty in office, students in nearby learning center
  - (RIT-RIT) Faculty in office or other space on campus, students at home

- RIT Grad Student/Camden Students
  - Only remote!

- RIT Off-Campus Adjunct/RIT Students
  - Only remote!

- Cornell Student Tutor/Cornell Student
  - Tutor in office, student in nearby learning center

Remote Tutoring

- Framework based on traditional, face-to-face model used at NTID
  - 2011-12, RIT/NTID provided more than 14,000 hours in STEM tutoring to D/HH students registered in courses in 8 STEM-related colleges at RIT (Applied Science & Technology; Computing & Information Science; Engineering; Imaging Arts & Sciences; Science) (~500 students)
  - Faculty members provide individual and small group sessions to support students outside of class
    - Appointment-based (not walk-in)
  - Synchronous vs. asynchronous models

Remote (Synchronous) Tutoring Strategies

- 1:1 or 1:several tutoring sessions
- Google+ Hangouts as videoconference/chat platform
- 15 min-3 hr sessions
- Appointment-based scheduling
- Homework-oriented (vs. basic skills)
- Macs, PCs, desktops, laptops, Chromebooks

Synchronous Tutoring Benefits & Challenges

- Benefits
  - Good tool for sharing documents
  - Easy to search & highlight key phrases with student
  - Good for observing students' homework and watching for mistakes, providing faster feedback
  - Good for classes with heavy online component
  - Better accommodation to student schedules
  - Meet multiple students at same time
- Challenges
  - Digital whiteboard
  - Unannounced changes in Google+ interface
  - Eye contact & turn-taking different online

Remote (Asynchronous) Tutoring Strategies

- 1:1 tutoring sessions
- eMail & VP messages, photos, diagrams, handouts, shared documents
- Homework-oriented (vs. basic skills)
- Macs, PCs, desktops, laptops, Chromebooks

Asynchronous Tutoring Benefits & Challenges

- Benefits
  - Provided flexibility for travel when there were time differences between tutor and student or other schedule conflicts
  - Allows students to process material at their own pace
- Challenges
  - Helping students to problem-solve

Remote Tutoring – Lessons Learned So Far

- Tutoring strategies
  - Synchronous v asynchronous
- Scheduling
  - Appointments v "walk-in"
- Challenges
  - Network/browser inconsistencies
  - Training & technical assistance
  - Google+ UI changes
- Strategies
  - Ethernet connection/Chrome browser
  - Ongoing feedback & technical assistance
  - On-line guides
  - Google Educational Enterprise account

Socialization

- Remote mentoring
  - D/HH STEM professionals
    - Personalized recruiting
    - Application including background check
    - Google+ presence
  - Mentoring platforms
    - Google+ private community
    - Google+ Hangouts
    - Email
    - Face-to-face meetings

Socialization

- Peer-to-peer (community) interaction
  - Google+ private community
    - STEM articles of interest
    - Share student schedules
    - Announcements (events, internships, scholarships)
    - Open forum for mentors to provide 1-to many mentoring in forms of
      - Information sharing (e.g., pictures of work)
      - Job opportunities
      - Offers for assistance

Socialization – Lessons Learned Thus Far

- Someone to facilitate engagement
  - Encourage through personal contact
  - Weekly newsletters
- Critical mass of participants
  - Started Google+ Private Community with about 25 participants (January, 2013)
  - Activity increased with approximately 55 participants (December, 2013)
  - Current membership 62 participants

Accessible Media

- Curated STEM Resource library on our public website: www.dhhvac.org
  - Project publications and presentations
  - Relevant work by others
  - STEM ASL dictionaries (e.g., ASL-STEM Forum)
  - Links to accessible STEM resources (e.g. Khan Academy, Math for College)
- STEM-relevant articles and videos in Google + Private community

Accessible Media— Lessons Learned Thus Far

- Importance of being assertive!

  – Not all videos are captioned

  – Sometimes, captioned versions are available, but haven't been posted

Recruiting Strategies

- Tutors
  - Department Chairs
  - Individual contacts
  - Professional development training session
- Students
  - Tutors
  - Individual contacts
- Mentors
  - Recommendations from administration
  - Alumni association
  - Individual contacts

Monitoring Community Usage

Communication Channel	Tracking Method
Google+ Private Community	Relatively easy--manual
Hangouts	Somewhat easy—need notification of hangout
Enterprise email account	Somewhat easy, but inconsistent use
Chat	Difficult

Future Activities

- Remote Captioning

- Remote Interpreting

- Manual on Remote Tutoring

- Manual on Remote Mentoring

Discussion

Questions?

Answers!

Contact Information

Deaf STEM Community Alliance

http://www.dhhvac.org

Thank you!