Improving STEM Retention with an Online Community of Practice

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For Your Consideration

Do you have students who are:

• Underprepared for STEM coursework?
• Underrepresented and isolated (STEM-wise)?
• Seeking role models who are STEM professionals?
• Looking for connections between course content and “real world” topics?
• Interested in pursuing internships, research opportunities, or STEM-related jobs?
Overview

• Who we are

• Rationale for the project

• Describe the online community infrastructure

• Tutoring, mentoring, and STEM dissemination activities

• Tracking engagement

• Q & A
Who We Are

• Deaf STEM Community Alliance
  • Only Alliance specifically for D/HH students

• Supported by the National Science Foundation, HRD #1127955

• Ongoing project (started Sept 2011)
  • Now in our 7th year
RIT is the lead institution for this project, with Camden County College and Cornell University as partners.
The Narrow STEM Pipeline

Barriers to Success in STEM Prior to Postsecondary Education

Lower Enrollment in STEM Majors
28% Bachelor’s Degree/20% Associate’s Degree

Lower Retention – Within 6 Years:
48% leave Bachelor’s/69% leave Associate’s

Lower Graduation Rates at All Degree Levels
13.4% Bachelor’s Degrees/13.8% Associate’s Degrees

Fewer STEM Professionals

Chen & Soldner, 2013
DHHVAC Model
Barriers & Strategies

Student Preparation
Remote Tutoring
Remote Mentoring
Using G+ Hangouts or Zoom

Socialization
Remote Mentoring
Peer-to-Peer Interaction
Using G+ Private Community & Facebook Secret Groups

Accessible Media
Accessible STEM Information
Using Website, YouTube, G+ Private Community, Facebook Secret Group & G+ Public Page
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

• Objectives
  1) Document and disseminate a description of the process of creating a model VAC for replication
  2) Increase the GPAs and retention rates of D/HH students in STEM majors
Importance of Social Networks

- Opinion & behavior more similar within groups (Burt, 2004)
- Regulators of behavior (Easly & Kleinberg, 2010)
Importance of Social Networks

• Resource for social capital (Burt, 2004)

• Resource for innovation (Burt, 2004)
Model Infrastructure

G Suite for Education (Enterprise) Account & Facebook Secret Group (@dhhvac.org)

Deaf & Hard of Hearing Virtual Academic Community (DHHVAC)

Website (www.dhhvac.org)

YouTube Video Library (www.youtube.com/user/dhhvac)
Online Tutoring

• FAQs:
  • More than 160 sessions with ~35 different students
  • Avg. 60 minute sessions
  • Google Hangouts or Zoom

• Benefits:
  • Better accommodation of student schedules
  • Easy to share documents
  • Good for observing student homework, watching for mistakes, providing faster feedback
  • Good for classes with heavy online component

• Challenges:
  • Scheduling appointments
  • Strong Internet connection
  • Technology (e.g., camera, tablet, etc.)
(Mostly) Online Mentoring

• FAQs:
  • 18 DHH STEM professionals
  • One-to-one (email, video or FaceTime)
  • One-to-many (social media, YouTube videos)

• Benefits:
  • Support
  • Career development (academic/vocational)
  • Personal development
  • Role modeling
  • Individual (intergenerational continuity, new colleagues, future collaborators)
  • Institution (alumni engagement, increased student success)
Social Media Platforms

2012

• FAQs:
  • G+, all members
  • FB, about 2/3
  • M-F postings (STEM, opportunities, member news)

• Benefits:
  • Mitigates social isolation
  • Intergenerational community (social capital)
  • Awareness of STEM information
  • Language modeling

• Challenges:
  • Documenting engagement

2015

facebook
Student Successes

- 61 students enrolled
- 25 graduated
- 7 left prior to graduation
Conclusions

- Underrepresented populations benefit from positive role models
- Students can benefit from either direct or indirect mentoring
- Intergenerational cooperation and support can further BOTH personal and institutional objectives
- The DHHVAC is a model that attempts to implement this solution
Contact Information

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Select References


