Background & Related Literature

- Community colleges serve an important role in increasing the numbers of STEM degree recipients and skilled workforce.
- Associate’s degree recipients from all types of academic institutions increased from 26,500 in 1985 to 45,700 in 2005. Among these degree recipients, the number of associate’s degree recipients in engineering in 2005 was 2,072, the highest number since 1995.
- The number of associate’s degrees awarded in computer sciences increased rapidly from 9,627 in 1995 to 27,641 in 2005 (NSB, 2008).
- An increasing number of ethnic minority students are also evident among associate’s degree recipients.
- The number of S&E associate’s degrees among students with Hispanic origin increased from 2,498 to 5,205 in the decade from 1995 to 2005 (NSB, 2008).
- Federal agencies, such as the National Science Board (2003), and the National Academy of Engineering (2005) have recognized the role of community colleges in increasing workforce competency. Other federal agencies, such as the National Science Foundation (NSF), have supported the advancement of transfer function at community colleges in STEM fields. Tsapogas (2004) also found that community colleges are important institutions in the educational lives of science and engineering graduates.

Purpose of the Study

To propose a notion of STEM Student Success Literacy to better understand the effect of advising approaches for transfer, institutional and community characteristics and/or social and educational dynamics of female students in STEM at community colleges.

Methodology

- Case study & qualitative field work
- Two separate guided group interviews were conducted in Spring 2007 at two community colleges in Washington:
  - Pacific Willow Community College
  - Pacific Metro Community College

Both community colleges are part of the Northwest Engineering Talent Expansion Partnership (NW-ETEP) with other partner Washington postsecondary institutions to provide an opportunity for every student who is motivated and prepared to earn an engineering degree in the State of Washington.

- Faculty and program coordinators of NW-ETEP programs at HCC and SCCC identified six females to participate in the interviews.
- Female facilitators guided group interviews to create a safe and comfortable space for the participants to express their opinions.

- Data from the guided group interviews were tape recorded and transcribed. The researchers reviewed and coded the transcripts to identify recurring themes and opinions.

Implications for Future Research

- Strengthen a partnership between 2- and 4-year institutions to create educational environments that foster the emergence of the STEM Student Success Literacy
- Seek financial assistance from foundations and/or agencies (i.e., NSF) to develop and deliver inter- and intra- institutional infrastructures that encourage female students to pursue studies in STEM fields.
- Develop a multi-level model for the STEM Student Success Literacy at community colleges and to empirically test the model.

Research Questions

1. What are the academic and social characteristics of learning environment that made students “STEM Success Literate” and confident about pursuing a transfer to a four-year institution?
2. Who are the actors for an emergence of the STEM Student Success Literacy?

Conceptual Framework

- Negative impact of learning in the chilly climate on female students’ persistence and academic outcomes in STEM fields (Lovitts, 2001; Sax, 1994; Seymore & Hewitt, 1997; Vogt, Hocevar, & Hagedorn, 2007).
- Defining science literacy with a critical social lens - as a property of collective experiences and a social phenomenon irreducible to individual characteristics (Roth & Barton, 2004).

Themes

“I just wish someone had planted the seed and mentioned that you know, engineering is possible, and you can do this…just that little statement just like changed my world basically.”

STEM Student Success Literacy

- Students’ success literacy moments are continuous, and critical at the very beginning.
- Students develop ability to demystify their stereotypes and fears.

Division of Labor to create STEM Student Success Literacy

- Advising from faculty and program coordinators were critical to continue their engineering study and pursue transfer to a four-year institution. Additionally, understanding and support from peers and family members are equally critical for student success.

STEM Student Success Literacy

- Emerged as a property of collective experiences and an institutional phenomenon irreducible to individual characteristics.