Using Peer-Mentoring to Improve Freshman STEM Psychosocial Well-Being

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Abstract

Students’ psychosocial well-being is impacted by academics, health, and retention. Evidence suggests freshman year of college represents a critical period for learning and cognitive development. Many institutions utilize peer mentoring to help incoming students adjust to college, which can improve academic success and relatedness. Yet, it has not been fully explored how peer mentoring impacts social and mental aspects of students. Our study examines freshman STEM psychosocial well-being at the beginning of their first semester in college and assesses the mentor-mentee relationship in freshman STEM seminar courses. This project was done as part of the Delta Certificate.

Freshman students face academic challenges

\begin{itemize}
  \item 33\% of students had difficulty adjusting to the demands of coursework
  \item 33\% of students had a hard time developing effective study skills
  \item 47\% of students struggled with effective time management
\end{itemize}

Adjustment to college can be mentally difficult

\begin{itemize}
  \item 84\% felt anxious
  \item 51\% felt depressed
  \item 41\% were frequently overwhelmed by all they had to do
  \item 47\% anticipated seeking personal counseling
\end{itemize}

Imposter Impostor Syndrome (IP) as a readout for psychosocial wellbeing

\begin{itemize}
  \item Describes individuals who are marked by an inability to internalize their accomplishments and a persistent fear of being exposed as a "fraud"
\end{itemize}

Previous Literature shows that peer mentoring has multiple benefits

\begin{itemize}
  \item Increase academic scores (Mayer, R. E., Christofferson, R., and Fiorella, L., 2017)
  \item Improve retention (Potvin and Hazari, 2013)
  \item Fosters a sense of belonging and improves views of sciences (Potvin and Hazari, 2013)
  \item Benefits both the mentor and the mentee (Zaniewski and Reinholz, 2016)
\end{itemize}

Integrated Mentoring Program and Core Training (I.M.P.A.C.T.) Mission

Mission: I.M.P.A.C.T enhances UW-Madison undergraduate experiences by providing a learning environment in which faculty, staff and students can engage, discover, innovate, broaden participation in science and advance the teaching and learning of discipline-based leadership and mentoring in a diverse, inclusive, and science (STEM) community while preparing students for leadership roles, responsibilities, and beyond.

Goals and Roles for Peer Leaders in Freshman classes

\begin{itemize}
  \item **Academic Skills**
    \begin{itemize}
      \item Promoting disciplinary research and technical skills
      \item Teaching and learning disciplinary knowledge
      \item Valuing and practicing ethical behavior
    \end{itemize}
  \item **Psychosocial Skills**
    \begin{itemize}
      \item Provide motivation
      \item Promote student career and science self-efficacy
      \item Promote STEM identity
      \item Promote a sense of belonging
    \end{itemize}
  \item **Sponsorship Skills**
    \begin{itemize}
      \item Promote Students' independence
      \item Establish and foster Students' professional networks
    \end{itemize}
  \item **Interpersonal Skills**
    \begin{itemize}
      \item Listening actively
      \item Aligning Peer Leader-Student expectations
      \item Building trusting relationships/honesty
    \end{itemize}
  \item **Diversity/Culturally Focused Skills**
    \begin{itemize}
      \item Advancing equity and inclusion
      \item Reducing the impact of bias
      \item Reducing the impact of stereotype threat
    \end{itemize}
\end{itemize}

Participating freshman STEM classes

**Genetics 155**
- Freshman CALS seminar
- Approximately 60 students
- No peer mentors
- Clance IP survey in week 3 of semester

**InterAg 155: Issues in Agriculture, Environment and Life Sciences**
- Freshman CALS seminar
- Approximately 100 students total in two sections
- No peer mentors
- Clance IP survey in week 3 of semester

**Interdisciplinary Sciences 100: Exploring Biology**
- Freshman CALS seminar
- Approximately 200 students total in two sections
- Peer mentors (4 per section)
- Clance IP survey in week 3 of semester
- Peer Leader satisfaction survey in week 4 of semester

Conclusions

- UW-Madison freshman students experience high levels of IP
- Females and underrepresented minority students are specifically prone to impostor feelings
- 40\% of freshman want a peer mentor
- Freshman who spent more time with peer leaders, also had less impostor experiences

Future directions

- Examine levels of Imposter Syndrome over the entire semester
- Look at higher level courses to see if these trends persist (i.e., increased levels of IP in women and targeted minorities)
- Ask students how peer mentoring helped them, specifically
- Investigate the impact of peer mentoring from the mentor perspective

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