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Implementation of a Guided Mentorship Program in a STEM Community of Practice at a Two-Year College

Dr. Claire L. A. Dancz, Clemson University

Dr. Claire L. A. Dancz is a Research Associate for Education Systems at Watt Family Innovation Center and Adjunct Faculty in the Department of Engineering and Science Education at Clemson University. Dr. Dancz's research interests include faculty development, scholarship of teaching and learning, creativity in higher education courses, conation and the application of striving instincts, sustainable engineering and engineering grand challenges. She leads faculty development for technology-enhanced learning environments through the application of evidence-based teaching practices and the assessment of academic engagement and is an avid practitioner of Universal Design for Learning. Dr. Dancz teaches an interdisciplinary Creative Inquiry course on Conation and Creativity in Education and is the faculty director of Clemson University's National Academy of Engineering Grand Challenge Scholars Program. Dr. Dancz is a Kolbe^{TM} Certified Consultant and regularly consults on conation and striving instincts.

Dr. Elizabeth A. Adams, Fresno City College

Dr. Elizabeth Adams teaches full time as an Engineering Faculty member at Fresno City College in Fresno, California. She a civil engineer with a background in infrastructure design and management, and project management. Her consulting experience spanned eight years and included extensive work with the US military in Japan, Korea, and Hawaii. In 2008 Elizabeth shifted the focus of her career to education and academia, later receiving her Ph.D. in Civil Engineering and Sustainable Water Resources. Her work highlights a commitment to undergraduate engineering education and its improvement through best teaching practices. Her research efforts target ways to support and encourage diversity among students and how to create an inclusive learning environment. Professional interests include undergraduate research opportunities, service learning, STEM outreach, team teaching and learning communities, critical thinking and problem solving, active and experiential learning, teaching teamwork and leadership skills, water resources sustainability, and urban infrastructure sustainability.

Dr. Carol Haden, Magnolia Consulting, LLC

Dr. Carol Haden is Vice President and Principal Evaluator at Magnolia Consulting, LLC, a woman-owned, small business specializing in independent research and evaluation. She has served as evaluator for more than 40 STEM education projects sponsored by the National Science Foundation, the National Aeronautics and Space Administration, the William and Flora Hewlett Foundation, and the Arizona Department of Education, among others. Areas of expertise include evaluations of engineering education curricula and programs, informal education and outreach programs, STEM teacher development, and climate change education programs.

Dr. Yushin Ahn

Yushin Ahn received the B. Eng. Degree in civil engineering and the M.Sc. degree in surveying and digital photogrammetry from Inha University, Korea in 1998 and 2000, and the M.sc. and Ph.D. degree in geodetic science from the Ohio State University, Columbus, in 2005 and 2008 respectively. After three years of post-doctoral researcher at Byrd Polar Research Center, he joined Surveying Engineering at Michigan Technological University, Houghton, MI for six years.

He is currently an assistant professor of Civil and Geomatics Engineering, California State University at Fresno, CA. His research interests include digital photogrammetry, feature tracking, and sensor calibration and integration.

Karen Willis, Fresno City College

Karen Willis has been a teaching mathematics at the two-year community college level for 6 years, as well as 3 years at the university level. Karen has several years of experience in tutorial coordinating and tutor training, as well as participating as a faculty mentor for engineering scholars. She loves to foster collaboration in the classroom between students so they can learn to work and grow together.

Deanna Craig, Clemson University

Civil Engineering Clemson University 2021 graduate

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Abstract

Communities of Practice (CoP) have become powerful models for facilitating social learning in higher education. The Engineering Scholars Program (ESP), funded by an NSF Scholarships in Science, Technology, Engineering and Mathematics (S-STEM) grant, is a CoP designed to enhance the social learning experience of two-year college students preparing to transfer to a four-year university. A key feature of the ESP is guided mentorship by community college faculty members. During Year 1, the ESP took an unstructured approach to mentoring, allowing individual mentors to determine and apply their own mentoring strategies. Research and evaluation results indicated that faculty mentorship during Year 1 increased students' belonging, helped them manage and encouraged them to persist through personal and academic challenges, and empowered students to describe themselves as contributors to the STEM disciplines. Students also reported that mentoring could be improved through additional mentorship structure, increased meeting frequency, and strategic mentorship pairing.

When the ESP sought to pivot towards a more formal mentorship approach for Year 2, ready-made materials for a mentorship training program were not available to meet the unique needs of two-year community college faculty mentors who bring diverse experiences and may or may not have the same disciplinary background as the students' intended majors at the four-year institution. This paper presents the development and implementation of the ESP's guided mentorship program, summarizing program components designed for two-year community college faculty members and current faculty/peer mentorship feedback. Results from the first semester of the guided mentorship program indicate that faculty mentors utilized the new mentorship materials with success, though the additional professional development in mentorship highlighted desire for more mastery opportunities, and these requests should be addressed in subsequent mentorship trainings. Student feedback indicated that both faculty mentors and peer mentors provided critical support and were among the greatest benefit of the ESP for encouraging scholars to persist through challenges and continue on their academic path.

Introduction

Learning is a social process [1], [2]. For many university students, learning occurs in a spectator role, where the learner remains on the periphery, isolated from social connection to others within courses or groups on campus [3]. This effect can be exacerbated with low-income students, whose resource-constrained state may serve to limit their social connection due to additional, often outside, obligations necessary for sustaining their student status [4], [5]. Passive learning and lack of connection to others can have lasting impacts on students' personal association with a subject matter [6].

Communities of Practice (CoP) have been used to authentically engage students, avoiding peripheral or observatory experiences, and can enhance students' ability to move to community centers through legitimate participation, implicating learning during the process [2], [7]. CoP provide both short-term and long-term value to members, including, but not limited to: support

structures for tackling the challenges of purpose-driven work, processes to engage expertise, and construction of collective confidence that has long-term impacts on students' identity development [8].

How individuals interpret and interact with the sociocultural influences around them informs and alters not only their identity but also their self-beliefs about interacting in that social system [9]. Identity framework provides an understanding of how students see themselves in relation to STEM, based on their perceptions and their everyday lived experiences with STEM, and has been useful for studying persistence, particularly for underrepresented racial/ethnic groups and genders in STEM fields [10] - [14].

Theoretical Frameworks

This project was guided by theoretical frameworks developed by Lave and Wenger's situated learning within CoP and Hazari et al.'s construct of identity [7], [15] (Figure 1). Students that participate in CoP are more likely to continue onto the following academic year than their peers because learning communities establish a safe environment to learn, encourage students to take ownership of their learning, and create a sense of belonging to a larger community [16]. The value of CoP can be traced to three key structural elements: *domain* consisting of shared purpose and exploration that inspires participation, *community* made up of relationships of social learning with mutual respect and willingness to share in a collective experience, and *practice* comprised of domain-based knowledge that the community develops, shares, and maintains together [8].

We translate Hazari et al.'s identity framework more broadly to STEM, building on the work done in relation to students' physics identity [15]. Four key characteristics define how students identify with STEM fields: belief in performance on STEM tasks, belief in ability to understand STEM content, desire/curiosity to think about and understand STEM, and recognition by others as being good at STEM. STEM interest, a measure of students' identity, is a strong predictor of intended career choice [17] - [19]. We recognize that identification with STEM is one component of students' identity and that complex interactions occur between a student's personal identity (i.e., characteristics of self as defined by personal experiences), social identity (i.e., group orientation defined by shared experiences), and identification with STEM (i.e., context within STEM) [20].

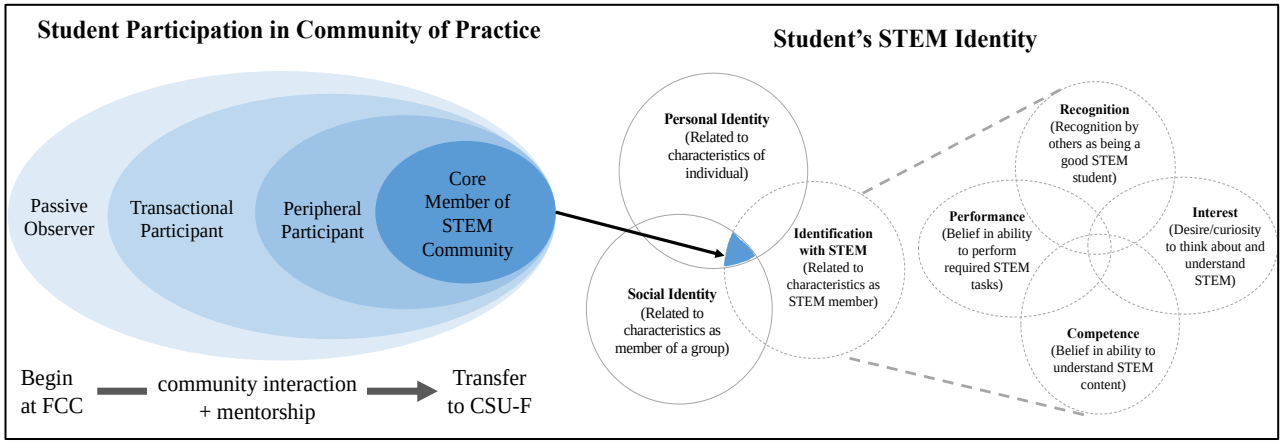


Figure 1. Theoretical frameworks guiding the ESP (Lave and Wenger, 1991 and Hazari et al., 2010).

While students are developing their personal and social identities, they are also, at the same time, developing a STEM identity based on influencing components of performance, competence, interest and recognition developed through authentic STEM experiences [15].

Engineering Scholars Program

The Engineering Scholars Program (ESP) CoP was established at Fresno City College through an NSF Scholarships in Science, Technology, Engineering and Mathematics (S-STEM) grant. The ESP is open to all students majoring in engineering that have demonstrated financial need. FCC, a Hispanic-Serving Institution (HSI) and Asian American and Native American Pacific Islander-Serving Institution (AANAPISI), also serves a significant number of socioeconomically disadvantaged students. Since students, particularly those from underrepresented groups, often cite mentorship and a sense of belonging within a supportive community as having the largest impact on their academic performance, the important role of mentors is emphasized within the CoP [21]. Rather than imposing rigid structures on the community construction, the ESP engages key mentors (faculty mentors, research mentors, and peer mentors) to lay the groundwork regarding mutual benefits of the community, with the goal that participating students establish and grow their personal STEM identity within their cohort in their own unique way [2].

Students participating in the ESP engage in both in-person and virtual program components. They attend bi-weekly seminars and regular meetings with their faculty mentors, research mentors, and peer mentors. In order to develop and sustain connections with other students outside of these meetings, the CoP has moved to increasingly text-based, online platforms allow both introverts and extroverts to share at equal footing [22]. The ESP attempts to mitigate the significant issue with online-based CoP of participant attrition, or lack of engagement, through intentionally designing the community to have intervening communication facilitators in the role of mentors [22]. In this paper we present the development and evolution of a guided mentorship program administered by the ESP mentors over the first two years of this program, in which eight students received support during Year 1 (Cohort A) and an additional eleven students were supported in Year 2 (Cohort B). Findings from Years 1 and 2 will be used to support additional considerations as this program matures and prepares for the transfer of FCC students to a four-year institution to complete their engineering degree.

Methods

We distinguish Years 1 and 2 of the ESP program by their discernibly different approaches to mentorship. During the first year of this program, mentorship took an unstructured approach with mentors engaging in initial training at the commencement of this project through facilitated sessions on mentoring engineering students, cultural literacy and under-representation in engineering, and review of technologies to support communication between mentors and mentees. Students participating in the ESP provided written feedback at the fall semester midpoint and written and oral feedback at the end of the spring semester during Year 1. The ESP took a data-informed approach to mentorship based on student feedback at the midpoint and endpoints. Students and mentors provided feedback on the guided mentorship strategy implemented for Year 2 at the fall semester midpoint.

Year 1 Mentorship Approach

All faculty mentors on the project completed the training, including research mentors. A half-day in-person mentor training session was held at the start of the fall 2019 semester, and an additional four-hours of online training was provided through Canvas.

In-person training consisted of three sessions: 1) Mentoring Engineering Students, which reviewed project-based learning, roles and responsibilities in mentoring, and best practices for group mentoring; 2) Cultural Literacy, which covered equity issues for under-represented students in engineering and how to promote inclusiveness, and 3) a review of communication and teamwork technologies to increase engagement.

Participants were provided with an additional half-day of training materials on Canvas. Online training was provided in three sections. Section 1 was a review of the in-person training learning outcomes and a list of resources for mentors to review and comment on in the online discussion. Section 2 was a link to the Project Implicit social bias testing program [23]. Mentors took one or more implicit bias test(s) and discussed their results in the online discussion. Section 3 was a three-hour online learning module that described the American educational system from the perspective of Latinx students and families, how historical oppression and racism in America has impacted Latinx students, and how collaboration across institutions and including families can be a useful tool in addressing these issues [24].

Year 1 Mentorship Assessment

Students participating in the ESP provided midpoint feedback during the fall semester through a written response to question prompts (Table 1). Students were then asked to reflect on their midpoint written responses and provide any amendments to these responses during an interview with the researcher at the end of the spring semester. The goal of this endpoint interview was to document additional feedback from students after they completed an entire year in the program, emphasizing critical reflection on written midpoint responses. Mentors were asked to reflect on their mentoring experiences at the end of Year 1.

Table 1. Student Midpoint Feedback

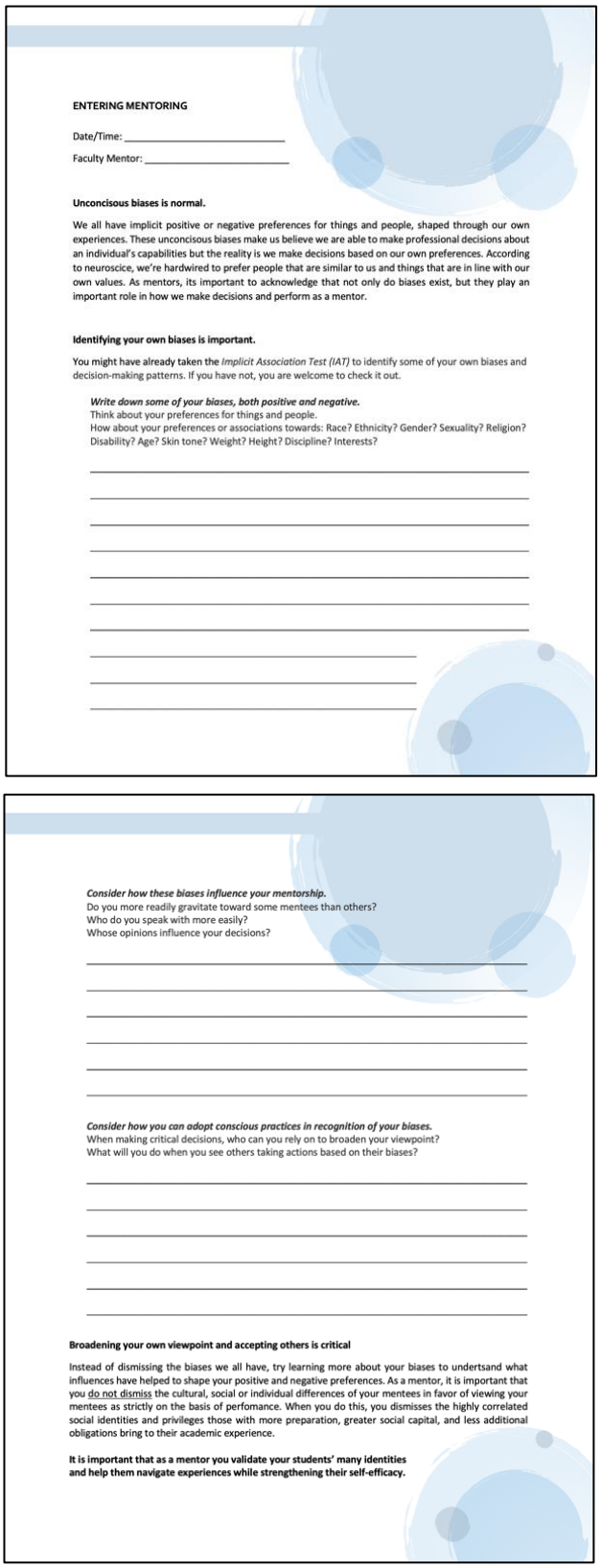
1.	Describe how you define community. Please be as specific as possible.
2.	Please rank the following program components (faculty mentoring, career exploration/major & course selection, seminars, undergraduate research, and assistance with transfer to a 4-year university) for their contribution to community as you defined it in Question 1. Please describe why you ranked the program components in this order. Be as specific as possible.
3.	If you were to describe your cohort to someone that has no experiences with your cohort, what would you say? Please be as specific as possible.
4.	Describe how your cohort functions on assignments related your undergraduate research project, such as the concrete mix design and lab report. Be as specific as possible.
5.	How do you think others perceive you in the cohort? Be as specific as possible.
6.	What makes you feel like you do belong in your cohort? Be as specific as possible.
7.	What makes you feel like you do not belong in your cohort? Be as specific as possible.
8.	What does it take to be successful in Science, Technology, Engineering and Mathematics (STEM)? Be as specific as possible.
9.	Who should have STEM careers? Why those people? Be as specific as possible.
10.	Please rank the following program components (faculty mentoring, career exploration/major & course selection, seminars, undergraduate research, and assistance with transfer to a 4-year university) for their contribution to success in STEM as you defined it in Question 9. Please describe why you ranked the program components in this order. Be as specific as possible.

Year 2 Mentorship Approach

During the second year the ESP adopted a semi-formal mentorship strategy. This mentorship strategy consisted of material development reflective of the key concepts from the mentorship approach in Year 1 (mentoring engineering students, cultural literacy and under-representation in engineering, and review of technologies to support communication) with an additional emphasis on culturally responsive mentorship as a whole. The materials were developed prior to the fall semester and were presented to the faculty and research mentors at the fall semester kickoff meeting. Mentors engaged with these culturally responsive mentorship materials together at the kickoff meeting; video and written materials were also provided in a take-home format for additional engagement after the meeting. We describe the materials in the sections that follow.

Since a core value of ESP is culturally responsive mentorship, we developed an eight and a half minute video on evidence-based mentorship practices that addresssed the importance of culturally responsive mentorship, includinng its impact on students' sense of belonging in a STEM community and the development of students' STEM identity [25] - [27]. Mentors were also provided with optional videos on culturally aware mentorship and mentor training to improve diversity in science [29] - [31]. Mentors were asked to view the video on evidence-based mentorship practices in preparation for the fall kickoff meeting.

The Year 2 fall kickoff meeting brought together ESP program leadership, faculty mentors, and research mentors in a virtual setting. The meeting began with a reflection on the key concepts of evidence-based mentorship practices video and an open forum on cultural responsiveness when mentoring. Mentors were



ENTERING MENTORING

Date/Time: _____

Faculty Mentor: _____

Unconcisous biases is normal.

We all have implicit positive or negative preferences for things and people, shaped through our own experiences. These unconcisous biases make us believe we are able to make professional decisions about an individual's capabilities but the reality is we make decisions based on our own preferences. According to neuroscice, we're hardwired to prefer people that are similar to us and things that are in line with our own values. As mentors, its important to acknowledge that not only do biases exist, but they play an important role in how we make decisions and perform as a mentor.

Identifying your own biases is important.

You might have already taken the *Implicit Association Test (IAT)* to identify some of your own biases and decision-making patterns. If you have not, you are welcome to check it out.

Write down some of your biases, both positive and negative.
Think about your preferences for things and people.
How about your preferences or associations towards: Race? Ethnicity? Gender? Sexuality? Religion? Disability? Age? Skin tone? Weight? Height? Discipline? Interests?

Consider how these biases influence your mentorship.
Do you more readily gravitate toward some mentees than others?
Who do you speak with more easily?
Whose opinions influence your decisions?

Consider how you can adopt conscious practices in recognition of your biases.
When making critical decisions, who can you rely on to broaden your viewpoint?
What will you do when you see others taking actions based on their biases?

Broadening your own viewpoint and accepting others is critical

Instead of dismissing the biases we all have, try learning more about your biases to undertsand what influences have helped to shape your positive and negative preferences. As a mentor, it is important that you do not dismiss the cultural, social or individual differences of your mentees in favor of viewing your mentees as strictly on the basis of perfomance. When you do this, you dismisses the highly correlated social identities and privileges those with more preparation, greater social capital, and less additional obligations bring to their academic experience.

It is important that as a mentor you validate your students' many identities and help them navigate experiences while strengthening their self-efficacy.

Figure 2. Entering Mentoring Worksheet

then divided into breakout rooms to discuss their own biases, their influence on mentorship, and the approaches to broadening their viewpoint through an Entering Mentoring worksheet (Figure 2) developed specifically for this kickoff meeting [25], [28]. After discussing this worksheet in breakout rooms, mentors gathered back in the main room to share their group discussions, ask questions regarding the worksheet content, and provide feedback on the exercise.

Mentors were also provided with additional worksheets, developed for the purpose of coaching mentors through the evidence-based mentorship practices, and reminders for documenting engagement in mentorship with their student mentees. Faculty mentors were asked to document goals and expectations of their mentees (Figure 3). Mentees were also given a parallel goals and expectations worksheet to document their goals and expectations for their mentor. Faculty mentors and mentees were asked to fill out this worksheet and share it with their mentor/mentee at the beginning of the semester, with both parties referencing it throughout the semester to track contributions towards completing the identified goals and, if applicable, revise the goals and expectations as they gained familiarity with one another.

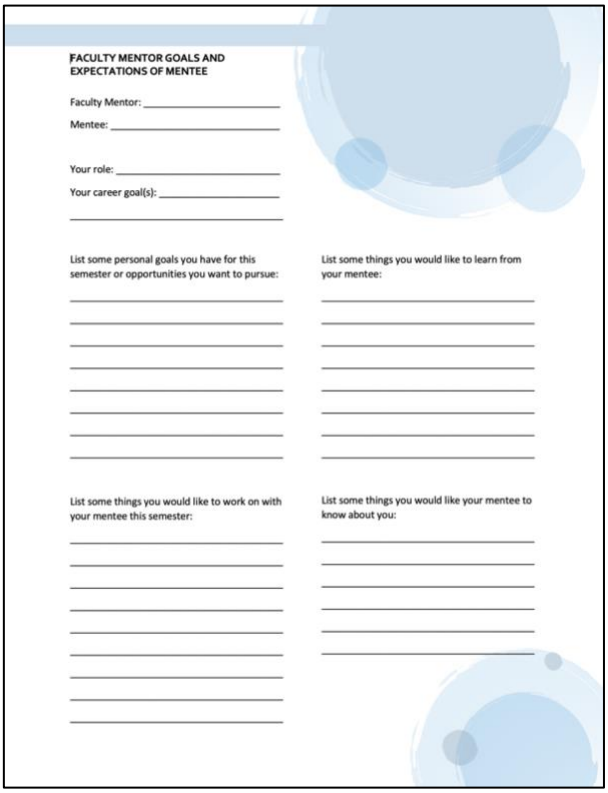


Figure 3. Faculty Mentor Goals and Expectations of Mentee Worksheet

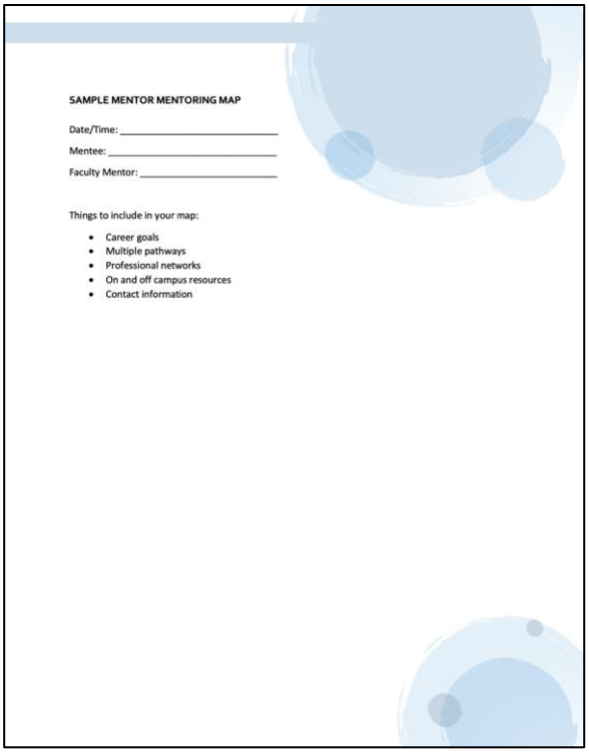
Mentors were also introduced to a mentoring map worksheet (Figure 4). The goal of the mentoring map worksheet was to provide an opportunity for mentoring to become a visual exercise, with mentors and mentees co-developing the map that documents career goals, development plans, professional networks to engage with, and identification of resources. Documentation of aspirations, strategies, and resources for goal achievement is an important aspect of the mentoring process. Mapping these items help mentees and mentors create visual connections and associate related characteristics and can advance mentoring conversations from superficial to strategic [32], [33].

Mentors were additionally provided with a meeting log worksheet to document meetings with mentees (Figure 5). Clearly identifying the scope of a mentoring meeting, such as meeting attendees, meeting objectives, and tasks to be completed by the next meeting, has the potential to create sustained conversations and deeper connections between mentors and mentees, whereas

lack of documentation can result in surface-level interactions. Mentors and mentees were advised to schedule meetings once a month at minimum, with flexibility to fit the needs of each individual student. In addition to mentor-mentee meetings, faculty mentors made a point to also meet with each other monthly to establish a mentoring group. This gave the faculty members a chance to discuss what is and is not working in their mentoring experiences.

In the week following the mentor kickoff meeting, mentors and mentees attended the FCC program orientation meeting that officially launched the ESP's fall semester. At this meeting the faculty mentors introduced themselves, their background, and their approach to mentoring. This introduction provided mentees with an opportunity to get to know all of the faculty mentors before voicing their preferred mentor-mentee pairing. This is in contrast to the approach in Year 1 where ESP leadership paired mentors with mentees. To pair with a mentor, mentees took a Canvas quiz to rank their preferred mentor choices. ESP leadership then used these rankings to optimize mentee choices and provide the best faculty mentor-mentee matching as possible.

An additional element was added to the mentorship landscape in Year 2, with the previous year's students (Cohort A- 4 students) transitioning into a peer-mentor role for the incoming Year 2 students (Cohort B- 11 students). To make this transition as smooth as possible, Cohort A met with a faculty mentor to discuss peer mentoring strategies, including how to guide mentor meetings and what it means to be a peer mentor. Each peer mentor from Cohort A was matched with members from Cohort B primarily by intended major. With the addition of peer mentors, the composition of mentoring in ESP was such that approximately three scholars from Cohort B would meet with one peer mentor scholar from Cohort A and each faculty mentor had at least four scholars to mentor.


SAMPLE MENTOR MENTORING MAP

Date/Time: _____

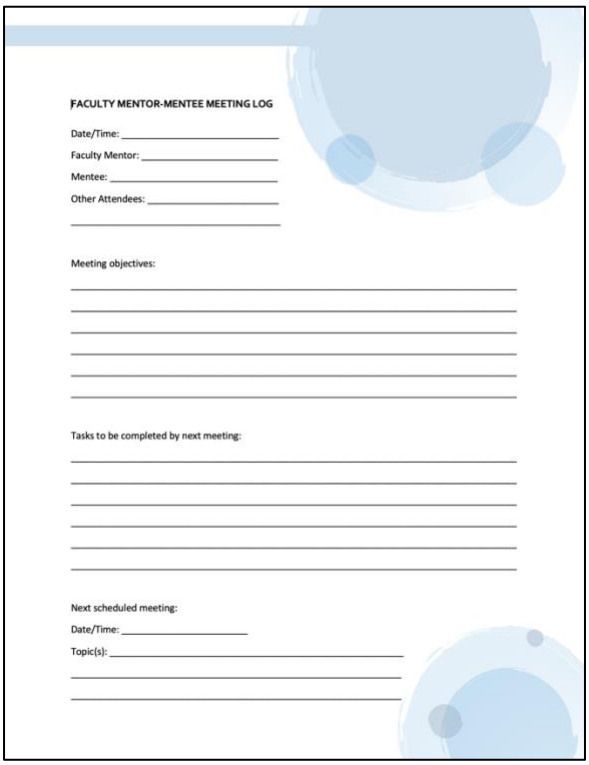
Mentee: _____

Faculty Mentor: _____

Things to include in your map:

- Career goals
- Multiple pathways
- Professional networks
- On and off campus resources
- Contact information

Figure 4. Sample Mentor Mentoring Map Worksheet


FACULTY MENTOR-MENTEE MEETING LOG

Date/Time: _____

Faculty Mentor: _____

Mentee: _____

Other Attendees: _____

_____

Meeting objectives:

_____

_____

_____

_____

_____

_____

Tasks to be completed by next meeting:

_____

_____

_____

_____

_____

_____

Next scheduled meeting:

Date/Time: _____

Topic(s): _____

_____

_____

Figure 5. Sample Mentor Meeting Log Worksheet

Year 2 Mentorship Assessment

Students from both Cohort A and Cohort B provided midpoint feedback during the Year 2 fall semester through a written response to the same question prompts from Year 1 (Table 1). Mentors were also asked to provide written feedback on their mentoring experience thus far in Year 2, reflecting on the training videos, entering mentoring, goals and expectations, mentoring map, and mentoring meeting log worksheets.

Results and Discussion

The ESP mentoring approach shifted towards a more formal mentorship training strategy in Year 2 based on feedback from student participants during Year 1. We present the results of the mentorship strategies by year and include feedback from both student participants and faculty mentors in the sections that follow.

Year 1 Mentorship Feedback

Student participants from Cohort A responded to ten question prompts at the end of the fall semester. All feedback that program participants provided was positive. The ESP was described by participants as "very thorough" and acted as a "bridge that covered the gap between classroom lecture/lab and individual interests". Participants reported that they felt invited into this unique community and that the program components fostered community. Some students raised concerns regarding social awkwardness and finding a balance between professional and friendly attitudes with other participants and mentors.

While ESP component ratings varied, the majority of students reported that mentoring contributed most out of any program component to the creation of a STEM community. Mentorship was also identified as directly relational to participant's success in STEM. Mentoring was said to be "a great way to build a succession system…and produce more community leaders." Students appreciated engaging with their mentors and having someone to answer questions. The general consensus from Year 1 was that intentional mentorship allowed for more interaction between students and faculty than the typical student would experience. This was also true about mentorship from undergraduate research mentors.

Students reported that the cohort seemed to work well together or "function as one" despite a large age gap between participants. There was a wide range of different types of groups formed; some were more cooperative throughout the duration of the program, some worked better as a collection of individuals who contacted each other only when questions came up. No participant reported being unhappy in their cohort and only had compliments for their groupmates.

Participants also praised the seminar portion of the program, especially that which emphasized social obligation and community outreach efforts, as it is an important part of the field that rarely gets talked about in the core curriculum classes. The sense of community awareness and social skills was deemed necessary to be successful in the STEM field by multiple participants. Other reported necessary qualities included dedication, motivation, and discipline.

During their endpoint interviews participants reported that mentorship was “one of the biggest aspects of this whole scholarship program”. Faculty mentoring increased classroom engagement, helped scholars navigate economic hardships brought on by the pandemic, and resulted in thankfulness for mentor assignment because there was someone to go to for “well rounded” support. Mentors were intentional about sustaining connections throughout the shift from in-person instruction to online instruction during the end of the Year 1 spring semester, “lifting weight” off of the students’ shoulders as the transition presented innumerable challenges. One student credited their mentor with such critical guidance that the mentor was responsible for helping them establish their path to an engineering degree that they otherwise would not have determined on their own. Overall, participants reported that the level of support provided by faculty mentors was the key element to their academic success and sense of belonging in this community.

Faculty mentors provided a written summary of their mentoring experience during the second semester of Year 1. One faculty mentor reported meeting regularly in-person with mentees until the COVID-19 pandemic required shift to online operations. This faculty mentor sustained engagement with mentees via email. One faculty mentor held individual mentee meetings at the beginning of the semester and transitioned to online group meetings via Zoom. Topics of discussion transitioned from educational, career, and personal goals to course struggles and support resources as the semester progressed. One faculty mentor supported mentees through meetings that covered topics of coursework, goals for the semester, least and favorite parts of the program for identification of opportunities for improvement, navigating online resources, and discussion of the impacts of online instruction due to the pandemic. These meetings occurred initially in-person and then shifted online.

One faculty mentor provided course-specific support during mentee meetings and also personalized transfer and resource support per the needs of the mentee. Faculty mentors also met with other instructors to discuss the additional workload students were managing resulting from the rapid shift to online instruction due to the pandemic, and the need to continually monitor student wellbeing. Overall, faculty mentors recognized the need for mentee meetings and expressed concern regarding checking in with their mentees to ensure they had access to the resources needed in a timely manner.

Year 1 evaluation report results indicate that all scholars felt mentoring contributed to feeling more motivated to complete their degree and to feeling supported academically and personally. The majority of participants (88.9%) indicated that faculty mentoring helped them feel motivated to transfer to a four-year institution, and that mentoring helped them gain a better sense of how to be successful in their current degree (88.9%). Mentors encouraged students to persist, helped them manage personal and academic challenges, and gave them insight into their future careers. Opportunities to improve mentorship included increasing frequency of the meetings, ensuring compatible mentor pairings, and considering specific topics for mentors and mentees to work on together.

Year 2 Mentorship Feedback

Students from Cohort A and Cohort B responded to ten question prompts during the fall semester of Year 2. Respondents described very positive student experiences for the program as a whole. Feedback highlighted specific features of the program, focusing more on aspects of the program that the students particularly enjoyed rather than areas that could be improved. Faculty mentoring ranked as the most important in terms of students' success in the program. The mentors were described as thorough in their research and preparation, and always willing to meet one-on-one for more particular guidance. They "proved to be invaluable in offering their insight and perspective from a real-life point of view." Mentors specific to the respondent were mentioned multiple times, showing strong bonds formed within the span of the semester.

All students reported learning a great deal of information in seminars, which ranked second to mentorship. Whether or not that information helped them achieve their future goals was dependent on the individual, but all participants seemed to greatly enjoy the seminars, nonetheless. The seminars also proved to be a good tool in creating community; student participation allowed the students to develop relationships amongst themselves and make connections that go towards improving their lives outside of the classroom. Career exploration ranked slightly below the seminars. Some responses were very animated and excited about the workshops, and others already had a clear idea of what their field of study would be, so the exploration wasn't as important to them. From those for the program, the career exploration section helped students "connect over common interests" and get "exposed to new ideas, then use the information to process their choice of major and career."

The program component of transferring to a four-year university received varied feedback. Numerically, it ranked as tied for least important along with undergraduate research. For the written comments, it wasn't mentioned very much, but when it was, participants were very vocal about how much it impacted their time in the program looking back. Those who ended up moving onto a four-year university or plan to in the future sung its praises and pointed to it as one of the main reasons why they chose that path. Respondents reported that those helping the students were well-informed and encouraging. Undergraduate research was mentioned the least out of all of the options. Opinions were split; some students saw it as an opportunity to get involved and get a step ahead for internships, others felt the effect of virtual learning put a strain on how much could actually be accomplished. Numerically, it ranked as tied for least important along with assistance with transferring to a four-year university with respect to impact on community formation.

During the first semester of Year 2, faculty mentors provided a written summary of their mentoring experience. One faculty mentor described meeting with mentees on a monthly basis, with the first two meetings being foundational to relationship building as the mentor and mentee got to know one another, progressing to long and short-term goal setting, and ending with individual meetings checking in on goal progress. Mentees used the goal mapping approach to visualize what could be done now that would pay off in the future. One faculty mentor met with two mentees weekly and two mentees every other week. The topic of the meetings focused on the pandemic and coping strategies for online learning environments, and the mentor reported confidence in supporting mentees through personal and professional struggles with resources and guidance as mentees navigated new unknowns.

One faculty mentor met with mentees every month and reported that all mentees were struggling with online instruction resulting from pandemic operations. A significant portion of each meeting was dedicated to providing supporting resources for online courses in addition to providing academic advice and planning. Mentees reported struggles due to a lack of study space at their residences, challenges with balancing course load and other responsibilities, such as work, and the need to address time management. This mentor provided feedback regarding internship opportunities, course planning, and improving academic performance in the subsequent semesters. One faculty mentor took on additional responsibilities to establish a peer mentor program in which Cohort A students became peer mentors for Cohort B students. Meetings with peer mentors focused first on how to be an effective peer mentor, and then transitioned to experiences with peer mentees. Peer mentors reported that their mentees discussed preferences for instructors, study methods, time management, and learning resources. Overall faculty mentors reported a need to sustain support for mentees that remain challenged to balance school with additional competing life obligations.

Faculty mentors also provided feedback on the Year 2 mentoring materials. Faculty mentors agreed that while the mentoring materials provided had utility, mentors ended up incorporating ideas from the materials into their own mentoring style rather than using the physical materials in the form they were provided. Mentors reported that the Evidence Based Mentorship Strategies Video provided complex information about mentoring, including the role of mentors in providing psychosocial, career/instrumental support, the role of mentorship in identity formation, and core competencies for formal mentor education [28]. Mentors reported that there is a need to spend more time with the complex topics and less time on discussing the barriers to mentorship as the faculty mentors reported that they were already aware of such barriers and that they were already invested in the program.

Mentors requested more information on the Entering Mentoring Worksheet (Figure 2), particularly on translating contents of additional resources into actionable mentoring strategies the mentees and mentors could engage with together [28].. No specific comments or feedback were provided for the Faculty Mentor Goals and Expectations of Mentee Worksheet (Figure 3) or the Faculty Mentor and Mentee Meeting Log Worksheet (Figure 5). Mentors reported that the Sample Mentoring Map Worksheet (Figure 4) was a favorite among faculty mentors as it provided instructions on an item to actively create with the mentees. Overall, all faculty mentors reported positive feedback about the program during Year 2 and emphasized that their interactions with mentees focused on providing support to manage the impacts of COVID-19 in addition to the academic mentorship support provided in Year 1.

While the COVID-19 pandemic impacted mentorship at the end of Year 1 and sustained impact during the Year 2, we did not realize the extent to which mentorship conversations would shift from Year 1 to Year 2 to focus on managing the impacts of the pandemic in all aspects of the mentees' lives. This result warrants additional mentor training and support focused on non-academic situations, including managing chronic stress and fatigue, as the impacts of the pandemic are expected to persist. Faculty mentors' identification of the need to break down complex mentoring topics into strategies that they could take action with suggests that providing an overview of these strategies was not sufficient and a deeper exploration of mentorship is needed. Since mentors preferred to adapt mentorship training information for their own use rather than use

the materials provided, future provisions should come in the format of additional training rather than additional written materials to provide faculty mentors with the opportunity to ask questions in a live session rather than require mentor interpretation offline. Faculty mentors' desire for more communication between each other highlights an opportunity to formalize time for the faculty mentors to engage in their own community, and for follow up on the strategies presented at the beginning of the semester at mentorship training.

Conclusion

This paper presents the development and implementation of a guided mentorship program for the Engineering Scholars Program (ESP), a community of practice designed to enhance the social learning experience of two-year college students preparing to transfer to a four-year university, funded by an NSF S-STEM grant. Research and evaluation results indicated that while ESP's unstructured approach to mentoring during Year 1 was responsible for their persistence, mentorship could be improved through additional structure, increased meeting frequency, and strategic mentorship pairing. The ESP pivoted towards a more formal mentorship approach for Year 2 through the development and implementation of a guided mentorship program. This program included ready-made materials for two-year community college faculty mentors. Results from the first semester of the guided mentorship program indicate that the new mentorship materials were used by faculty mentors with success, though faculty mentors identified a desire for additional mastery opportunities in subsequent mentorship trainings, with a preference for engaging in mentorship concepts and topics in their own way. Student feedback indicated that mentorship continues to provide critical support and is among the greatest benefit of the ESP.

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