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Emily A. Rickel

Embry-Riddle Aeronautical University, rickele@my.erau.edu

Barbara S. Chaparro

Embry-Riddle Aeronautical University, chaparb1@erau.edu

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Developing a Peer Mentorship Program in Human Factors Academia

Emily A. Rickel & Barbara S. Chaparro
Department of Human Factors and Behavioral Neurobiology
Embry-Riddle Aeronautical University, Daytona Beach, FL

Peer mentorship programs that pair more experienced students (i.e., mentors) with less experienced students (i.e., mentees) can have an effective, positive impact on university students' personal, academic, and professional outcomes. The purpose of this paper is to describe the process and lessons learned in the creation of a peer mentorship program in a Human Factors and Ergonomics (HF/E) academic department. Through a combination of peer networking opportunities and skill development workshops, the mentorship program outlined in this paper aims to promote students' academic and professional growth. Take-aways that can be utilized by other HF/E academia departments interested in starting or revamping their own peer mentorship programs are included.

INTRODUCTION

Peer mentoring and networking among university students have been shown to promote students' personal, academic, and professional outcomes. Formal programs can be developed to facilitate student mentoring and networking by pairing more experienced students (i.e., mentors) with less experienced students (i.e., mentees). Such programs have been found to positively impact mentee academic performance, as well as mentee participation and engagement in social and academic facets of university life (Asgari & Carter Jr., 2016; Snowden & Hardy, 2012). Peer mentoring programs can ease the transition of new students into academic programs by enabling them to become acquainted with faculty members and other students, and to encourage their involvement within the department (Hughes & Fahy, 2009). Experienced students can also benefit from mentorship programs. Student mentors can find enjoyment in supporting their mentees, develop stronger professional relationships with their peers, and reinforce their skills to become better students themselves (Colvin & Ashman, 2010). Additionally, students hold peer networks established in academia programs in high regard during their post-graduation job pursuits (Marmaros & Sacerdote, 2002).

A recent systematic review by Lorenzetti et al. (2019) highlighted the importance of graduate student participation in peer mentorship programs. The authors found that peer relationships in academia facilitate students' access to essential disciplinary knowledge, reduce feelings of academic anxiety and isolation, and advance the development of career skills. These findings were posited to apply to a wide range of degree fields and programs of study. Lorenzetti et al. (2019) concluded that peer mentorship can effectively supplement faculty supervision, broaden students' skills and experiences, and motivate students to finish their degree requirements. Thus, formal peer mentorship programs can benefit students and academic institutions by supporting student retention, skills development, and degree completion.

Undergraduate and graduate programs in Human Factors and Ergonomics (HF/E) can leverage these benefits by establishing formal peer mentorship programs to serve their student populations. HF/E academia programs are relatively small compared to other engineering and psychology areas of study (Brill et al., 2013). HF/E academia programs can

capitalize on this reality by taking steps to foster students' connections with their peers before graduating and to encourage a tight-knit HF/E academic and professional community.

The purpose of this paper is to describe the development of a peer mentorship program that has been established within the Department of Human Factors and Behavioral Neurobiology at Embry-Riddle Aeronautical University (ERAU) in Daytona Beach, FL. The ERAU Daytona Beach campus offers bachelor's, master's, and Ph.D. degree programs in HF/E. Two student organizations – the Human Factors and Ergonomics Society (HFES) Student Chapter and the Psi Chi: The International Honor Society in Psychology Chapter – supplement undergraduate and graduate HF/E education through extracurricular activities and experiences. Through a combination of peer networking opportunities and skill development workshops, a peer mentorship program was developed at ERAU to promote students' academic and professional growth by: 1) building student networks, 2) informing students about HF/E skills, research topics, and career opportunities, and 3) improving student leadership and communication skills. The following sections will introduce the program's development from its inception in Fall 2019, explain critical processes for mentor/mentee matching and workshop creation, and outline take-aways that can be utilized by other HF/E academia departments interested in starting or revamping their own peer mentorship programs.

PRACTICE INNOVATION

The idea to create an HF/E peer mentorship program at ERAU originated in Summer 2019. The initiative gained momentum in Fall 2019 when student officers of the ERAU Psi Chi Chapter leveraged their status as a student organization to create a program that benefitted all HF/E students. During the program's development (see Figure 1), the program founders gauged interest in the idea of a peer mentorship program, hosted a general brainstorming session, recruited the assistance of HFES Chapter officers and other student leader volunteers, created a mentor/mentee matching survey, sponsored a general information and "speed mentoring" session, and matched student mentors and mentees.

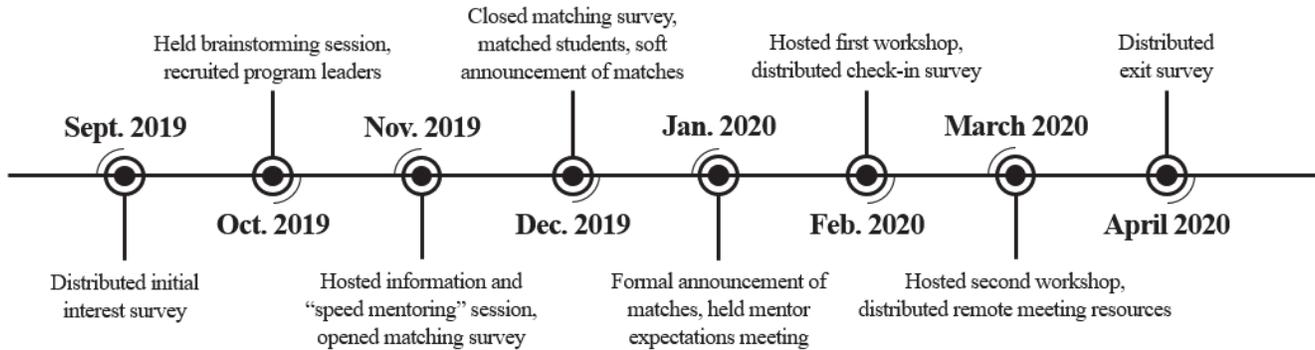


Figure 1. Timeline of events for the first year of the ERAU HF/E peer mentorship program.

Initial Interest Survey & Brainstorming Session

The student founders of ERAU’s HF/E peer mentorship program recognized that the program’s success relied heavily upon the support and engagement of ERAU’s HF/E student population. As a result, our first step in developing the program was to gather initial perceptions and interest from HF/E graduate students, who were thought to be the primary pool from which volunteer mentors would originate. We developed and distributed an interest survey to 59 HF/E graduate students to gauge their likelihood of volunteering as a mentor. We also collected open-ended feedback and suggestions for the program.

Results from the interest survey were used to structure a brainstorming session that occurred one month after the interest survey was distributed. All HF/E graduate students were invited to attend the one-hour brainstorming session led by a Psi Chi officer. The session included a brief presentation on the importance of mentorship, how mentors can benefit from participating in a mentorship program, and general expectations for mentors (e.g., be supportive and approachable, be willing to answer questions and provide guidance to your mentee). Then, the presenter moderated a discussion of several key points, including mentor/mentee matching structure (e.g., How many mentees would be matched to one mentor? How many mentors would one mentee have?), mentor/mentee matching processes (e.g., How would mentors be paired with mentees?), and ideas for activities that could be sponsored by the program.

The brainstorming session was extremely valuable in generating ideas, addressing hesitations (e.g., Am I qualified to be a mentor? If I am a mentor, will it take up a lot of my time?), finalizing program details, and advertising the program. As a result of the brainstorming session, we decided to incorporate several opportunities for flexibility in the program (e.g., students choose whether they want to be a mentor or mentee instead of being assigned a role, students who want to be mentors indicate how many mentees they are comfortable advising) to encourage program participation and make the program more accessible to the busy lives of students. We also believe that opening planning discussions and decisions to all HF/E graduate students fostered a sense of ownership and stake in the program’s development. In fact, following the brainstorming session, we received support from several graduate student leaders and formulated a partnership with the

HFES Student Chapter officers. This support played a fundamental role in strengthening the program’s foundation and in achieving next steps, such as creating the mentor/mentee matching survey and hosting a general information session.

Mentor/Mentee Matching Survey Creation

After successfully amassing interest and support for the program, we shifted our focus to finalizing one of the most important aspects of the program: how mentors and mentees would be matched. We believed mentors had to be well-suited to their mentees, and vice versa, in order for the students and program at large to thrive. To determine which students had the potential to successfully match with other students, we created a matching survey to gather information about their academic and professional goals, as well as relevant experiences.

Demographics and mentorship preferences. The first part of the survey captured demographic information, including the student’s name, email, academic year (e.g., Freshman, Senior, Master’s Student), and expected date of graduation. The second section allowed students to indicate which role they believed best fit their experience level. Students could choose to be a Mentor, Mentee, or “both” (in which the student would be matched with both a mentor and mentee; the “both” role was later renamed to “Junior Mentor”). To aid this self-selection process, students were told that Mentors would likely be Juniors, Seniors, or Graduate Students, while Mentees would likely be Freshmen, Sophomores, or Transfer Students. Students were told they could elect to fill both Mentor and Mentee roles if they felt they had valuable academic and/or professional experience that could be shared with a mentee, but would still benefit from having a mentor. We believed giving students the freedom to choose their role would encourage them to take ownership of the role and its responsibilities. The second section of the matching survey also asked mentor respondents to indicate how many mentees they felt comfortable advising. Respondents were also asked to list the name of their preferred mentor/mentee (if applicable), but were told they were not guaranteed to be paired with this student.

Interest areas. The third section of the matching survey requested respondents to rate their interest in various HF/E topics (e.g., consumer products, driving, gaming, sensation and perception, teamwork, UX/usability) and career domains (e.g., academic, government, industry) on a five-point Likert scale

from “very interested” to “very uninterested”. Respondents were then asked to rank their top three HF/E topics. The lists of HF/E topics and career domains were created by reviewing ERAU HF/E faculty member profiles and selecting items that best represented each faculty member’s specialties.

Professional and academic experience. The fourth section of the matching survey asked respondents to describe their professional and academic experiences. Additionally, we asked students to list the faculty members they work closely with (if any), and to list faculty members that would like to work with and why. Finally, respondents were asked to describe three goals they had as a participant in the mentorship program and to list any suggestions they had for improving the program.

The matching survey was created by the program leaders using Google Forms. The survey was first released during the general information and “speed mentoring” event and was distributed via email to all HF/E undergraduate and graduate students after the event ended.

General Information & “Speed Mentoring” Session

The purpose of the general information and “speed mentoring” session was to introduce the program to all HF/E students. Prior to this event, the program had only been advertised to HF/E graduate students as we enlisted their assistance during brainstorming and planning discussions. All HF/E undergraduate and graduate students were invited to the information session, which took place in November 2019.

To prepare for the information session, the program leaders created the matching survey, booked an on-campus event space, designed and disseminated flyers advertising the event, developed an informational presentation, and planned a “speed mentoring” activity (similar to a “speed dating” activity, but with professional connections in lieu of romantic connections!). The informational presentation covered the program’s purpose, roles (e.g., Mentor, Mentee, “both”/Junior Mentor), requirements and expectations (e.g., graduate no earlier than May 2020 to ensure matches had at least one full semester to build their connection, fill out the matching survey, participate in program workshops and events), and timeline for the matching process. Attendees were notified they had three weeks to fill out the matching survey and that their match would be announced by the end of December 2019.

After delivering the informational presentation and answering attendee questions, we described the rules of the “speed mentoring” activity. The purpose of this activity was to facilitate quick introductions between potential mentors and mentees, and see if a professional “spark” ignited to suggest that the mentor/mentee pairing would be a good match. The activity consisted of seating preselected HF/E student leaders at different tables with 2-3 attendees. Attendees were given 8 minutes to listen to their HF/E student leader’s elevator pitch (we provided preparation materials to help the table leaders structure their elevator pitch, which primarily consisted of information related to their academic and professional backgrounds) and ask questions. After 8 minutes, attendees rotated tables and repeated the process with their new HF/E student leader. These rotations continued every 8 minutes until all attendees met all HF/E student leaders. Following the

activity, a QR code and web link for the matching survey was presented and attendees were reminded to fill out the matching survey in order to be paired with a mentor and/or mentee.

Mentor/Mentee Matching Process

Once the matching survey closed during the first week of December 2019, the program leaders met to review the survey results and match respondents based on similar academic and professional interests.

To perform this task, we exported the Google Form responses to a spreadsheet and gathered by a whiteboard with markers. We made an initial pass through of the responses to ensure that all students would graduate no earlier than May 2020. We also noted any mutual listings for preferred mentors/mentees (i.e., noted cases in which a mentee listed a student as their preferred mentor, and that student mentor also listed the mentee as their preferred mentee). Then, we reviewed each respondents’ desired roles, their top three HF/E interests, prior and/or desired experience, and established and/or desired faculty member connections. Based on this information, we then mapped potential matches by listing students’ names on the whiteboard and drawing arrows between them to signify their connection (see Figure 2 for an example of a matches list). This process took approximately two hours and required several iterations of drawing and re-drawing connection lines between students. Additional considerations when matching students included similarities between mentee goals and mentor experiences, as well as the number of mentees a mentor was willing to advise.

After matches were made, the connections drawn on the whiteboard were transcribed into a digital document, similar to what is shown in Figure 2. Program leaders then distributed a “soft” announcement of matches in mid-December 2019 by emailing all matched students individually with information about their prospective matches and next steps. Students were given a few days to respond to the email to confirm their commitment to participate in the program and accept their prospective match. This email also directed mentors to create a brief biography that could be sent to their mentees at the start of the Spring 2020 semester. Mentees were directed to create a resume, CV, and/or professional website to prepare for the first program-sponsored workshop that was planned for February 2020. In January 2020, a formal announcement of matches and a finalized matches list was emailed to all program participants. In total, 34 students were matched with a mentor and/or mentee.

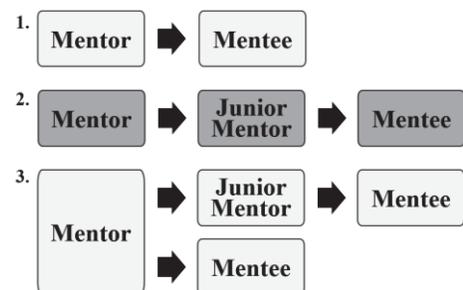


Figure 2. A sample matching list, with three examples of how Mentors, Junior Mentors, and Mentees can be matched.

PRACTICE APPLICATION

The formal announcement of mentor/mentee matches signified the beginning of a new program phase: connection initiation and strengthening. We sought to facilitate mentor/mentee introductions and subsequent communications by developing and hosting workshops, which also served to build students' academic and professional skills. Additionally, we solicited feedback from program participants through check-in and exit surveys. This feedback initiated changes to the program for Fall 2020 and beyond.

Workshops

Skill-development workshops were implemented to promote mentor/mentee communication and knowledge. We formatted these one-hour workshops to include informational presentations and interactive activities. For each workshop, program leaders brainstormed a topic that would be of interest to all program participants, collected resources on that topic, created presentation slides that summarized these resources, and developed activities that would encourage direct interaction between mentors and their mentees. Our goal was to host two workshops and an on-campus game night over the course of the Spring 2020 semester.

Prior to the first workshop, program leaders met with all mentors in mid-January 2020 to discuss mentor expectations and tips for contacting mentees. We also provided more information about our resume/CV/website workshop. Mentors were asked to check in with their mentees' progress in preparing for this workshop, as mentees were tasked with creating a resume, CV, and/or website (they were told to choose one or more items to prepare). The workshop started with a presentation led by program leaders that introduced these materials, displayed examples, and provided resources for additional reading. After the presentation, workshop attendees gathered into mentor/mentee groups. Mentees in each group provided their prepared materials to their mentors and received personalized feedback on their resumes, CVs, and/or websites. Some mentors opted to bring their own materials and provide them to their mentees during the group activity.

The second workshop took place in early March 2020 (prior to COVID-19 restrictions). The topic of this workshop was "HF/E Job Search & Interview Tips". Similar to the previous workshop, program leaders first provided a brief presentation on where to find HF/E jobs, common search terms and job titles for HF/E positions, and tips for applying and interviewing for an HF/E position. Mentor/mentee matches then broke out into groups and reviewed a list of common interview questions. This list was created by the mentors and program leaders. During the group activity, mentors were encouraged to pose one question to their mentees and listen to their response. Mentors were then asked to provide their mentees with tips and examples for how mentees could improve their response. This process was repeated for all questions.

In mid-March 2020, COVID-19 required us to pivot and migrate online. Our original plan to host an on-campus game night in April 2020 to facilitate fun, informal mentor/mentee interaction was cancelled. Mentors and mentees were also

discouraged from meeting in person. The program leaders quickly put together and distributed resources for remote meeting tips, etiquette, and platforms.

Feedback Surveys

The program leaders believed it was important to regularly collect feedback from program participants. This feedback allowed us to improve the program and ensure that students were having a positive experience within the program.

Check-in survey. A check-in survey was developed and distributed to all program participants in February 2020 after the first workshop. The check-in survey asked respondents to indicate their name and role, whether they had corresponded with their mentor/mentee, and how satisfied they were with their mentor/mentee communications and with the resume/CV/website workshop. Respondents who indicated they had corresponded with their mentor/mentee were also asked to indicate their communication modalities (e.g., in-person, email, phone) and frequency.

Exit survey. Program leaders developed and distributed an exit survey in April 2020 to capture final perceptions of the program. The exit survey included questions from the check-in survey, along with additional questions about satisfaction with the program and its leadership. Furthermore, the exit survey collected insight into the extent to which the program improved student academic and professional skills, the likelihood that participants would recommend the program to other students, and whether there was any interest in potential future positions (e.g., Alumni Mentors, Program Committee Members).

Fall 2020 and Beyond

The exit survey informed leaders about program aspects that worked well and elements that needed to be improved. In general, respondents believed the program was worthwhile. Students enjoyed the workshops and reported they were able to establish a stronger relationship with their mentors/mentees because of the workshops. Respondents also liked the balance of structured workshops and flexible individualized guidance offered by their mentors. Suggestions for improving the program included creating a centralized online communication channel (e.g., Microsoft Teams, Discord) for all program participants, addressing mismatches between mentor/mentee desired level of involvement, and hosting more workshops that also directly benefitted mentors and not just mentees.

In August 2020, program leaders opened a call for committee members to formalize the program leadership roles, enlist additional perspectives and assistance, and provide training for students who hopefully continue the program for future years. Program leaders also developed a Microsoft Teams channel to aid remote/virtual communication and announcement distribution. Mismatches between mentor/mentee desired level of involvement were addressed by establishing a "three-strike" communication rule (i.e., 1 – unresponsive to mentor/mentee, 2 – unresponsive to program leadership, 3 – unresponsive to program leadership follow-up, participation discontinued for the semester) to prevent inactivity. Additionally, a question related to desired

communication frequency was added to the matching survey so we could use this preference when creating future matches.

The remainder of the Fall 2020 semester followed a similar string of events as the previous year. The committee members hosted a virtual information session, with the “speed mentoring” activity taking place using Zoom breakout rooms. We then collected responses to the modified matching survey, matched 29 students via Teams video call, and distributed soft and formal announcements of matches. We hosted two events: 1) a modified version of the resume/CV/website workshop that included beginner and advanced tracks to cater to both mentees and mentors, respectively, and 2) a student panel about attending and presenting at academic conferences. Program leaders also created and distributed self-paced activities related to cover letters for job applications, personal statements for graduate school applications, and thank you letters. These activities were created in response to feedback from the Fall 2020 check-in survey where mentors requested more tasks and deliverables to accomplish with their mentees.

At the beginning of the Spring 2021 semester, we reopened the matching survey to all HF/E students. Nine additional students joined the program as Mentors, Junior Mentors, and Mentees. Matches from Fall 2020 were preserved, with some mentors gaining additional mentees. We also rebranded the program as a committee of the ERAU HFES Student Chapter to promote program continuity. We renamed ourselves the “HFES Mentorship Program”. Future plans include hosting more workshops and panels, creating and distributing mentor/mentee activities, and collecting program participant feedback through surveys.

DISCUSSION

Now called the HFES Mentorship Program, ERAU’s HF/E peer mentorship program has undergone many changes since it began in Fall 2019. Results from our feedback surveys consistently indicate that students are satisfied with the program and are benefiting from their participation in the program. While it certainly helps to have access to an academically diverse HF/E student population (e.g., B.S., M.S., and Ph.D. students), we believe the program structure outlined in this paper can be adapted to meet the needs of students enrolled in HF/E academic programs of various sizes and degree options.

Current and future challenges for the HFES Mentorship Program include engagement and continuity. COVID-19 prevents face-to-face and “hallway” meetings where students casually interact with one another. This may limit frequency of mentor/mentee contact and impede the development of strong professional connections. Additionally, we face an issue of program continuity. The committee members would love to see this program continue to serve future students. We need to recruit younger students into the leadership ranks and determine how best to transition them into these roles.

Through this program, we hope to build a stronger network for our students and future HF/E practitioners. We would enjoy the opportunity to collaborate with other HF/E academic programs to exchange ideas for promoting student success and to inform a broader peer mentorship model for the HF/E community.

TAKE-AWAYS

- Prior to starting a peer mentorship program, take time to ensure that students at all levels are interested in supporting such a program.
- Allow students to contribute to the program’s development. This facilitates a sense of ownership and stake in the program.
- Appoint student leadership roles, outline clear responsibilities for each role, and make a multi-year plan to promote program continuity.
- Create activities and events that encourage interaction between mentors and mentees. Provide different delivery options (e.g., one-time structured workshops, self-paced take-home activities) and topics to accommodate students’ dynamic schedules and interests.
- Collect and implement feedback from program participants. Respond to the needs of your students. Adapt and iterate the program structure as needed.

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