Mentor training practices of NSF funded
Research Experiences for Undergraduates (REU) Sites

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Mentorship quality is critical to undergraduate research students' experiences [1,2,3]. Effective tools and curricula help people increase their mentoring skills [4,5,6]. The purpose of this study is to investigate the rate at which NSF-funded Research Experiences for Undergraduates (REU) Sites in engineering disciplines include procedures for training the faculty, graduate students, or other personnel who mentor the REU students; reasons why some programs do not incorporate mentor training into their REU Site procedures; and which tools and curricula for mentor training are most commonly adopted by engineering REU Sites.

Under a protocol approved by the Institutional Review Board of The University of Texas at Austin, we invited representatives of NSF-funded REU Sites to participate in an online survey about mentoring training practices. REU Sites currently funded by NSF that include the keyword "engineering" in their directory listing were identified from the publicly-available NSF directory (https://www.nsf.gov/crssprgm/reu/list_result.jsp). Excluding our own Site, an email invitation was sent to the contact email address of the 242 Sites that matched our criteria. 42 people agreed to participate and 1 person declined to participate. Two people who agreed to participate did not answer any of the survey questions; hence, 40 responses were considered.

The most substantial limitation of this study is that the response rate was only about 17%. We suspect that representatives of Sites that include mentor training may have been more likely to respond to the survey than representatives of Sites that do not include mentor training. Hence, we suggest that the survey responses of the representatives of Sites that include mentor training probably provide some insight about Sites that include Mentor training whereas the experiences reported by the representatives of Sites that do not include mentor training should be interpreted more cautiously.

- Are mentors at your REU Site required to participate in mentor training? (yes, no)
- Why aren't mentors required to participate in mentor training? (text entry)
- Is optional mentor training available to mentors at your REU Site? (yes, no)
- Why isn't optional mentor training available to mentors at your REU Site? (text entry)
- Do mentors at your REU Site participate in the optional mentor training? (yes, no)
- Why don't mentors at your REU Site participate in the optional mentor training? (text entry)
- Please indicate the types of mentors who can undergo mentor training at your REU site. (Select all that apply: faculty, postdocs, graduate students, undergraduate students, other)
- What other types of mentors? (text entry)
- What format of mentor training is available at your REU Site? (Select all that apply: online, in-person, other)
- What other format of mentor training? (text entry)
- Approximately how much time does it take for a mentor to complete the mentor training that is available at your REU Site? (<1 hour, 1-2 hours, 2-3 hours, 3-4 hours, >4 hours, don't know)
- Please describe the mentor training available at your REU Site. For example, is a published curriculum used? (text entry)
- Please provide any additional feedback about how mentor training practices are used at your REU Site. (text entry)

Figure 1. Survey questions about mentoring practices of NSF-funded Research Experiences for Undergraduates (REU) sites

The mentoring practices survey instrument was distributed by email and implemented in Qualtrics, with an adaptive design through which participants were posed subsequent questions based on their answers to prior questions (Figure 1, **Figure** 2). Since the survey was adaptive and a response was only required for the initial question to establish consent to participate, the number of responses received for each question varies.

Are mentors at your REU Site required to participate in mentor training? Of the 40 responses, 18 / 40 reported that mentor training was required. However, we suspect that this is an overestimate given the modest survey response rate.

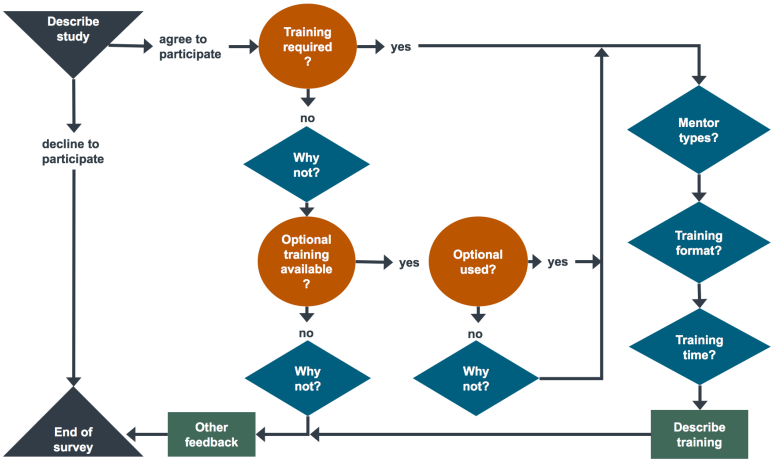

Figure 2. Flowchart summarizing the structure of the survey on mentor training practices.

Why aren't mentors required to participate in mentor training? The most common reason given was that the mentors were highly experienced. Another explanation was that there wasn't a training program available.

Is optional mentor training available to mentors at your REU Site? Of the REU Sites that did not require mentor training, about half of them offered it on an optional basis (11/21). However, we suspect this is an overestimate given the modest survey response rate.

Why isn't optional mentor training available to mentors at your REU Site? Of the REU Sites that didn't offer optional mentor training, reasons for not doing so were similar to those for not requiring mentor training: experienced faculty, or lack of a training program to offer.

Do mentors at your REU Site participate in the optional mentor training? Of the REU Sites that didn't require mentor training but did offer optional mentor training, about half indicated that mentors participate in the optional training (6/10). However, we suspect this is an overestimate given the modest survey response rate.

Why don't mentors at your REU Site participate in the optional mentor training? Only five responses were received to this question, but those responses indicate that some reasons why people don't utilize optional mentor training are prior mentoring experience and lack of time.

Please indicate the types of mentors who can undergo mentor training at your REU Site. At the 29 Sites that offer mentor training (required or optional), mentors who can undergo training include faculty (22/29), postdocs (21/29), graduate students (21/29), undergraduates (5/29), and other (4/29). Other people who can undergo mentor training include program administrators, research staff, and industry partners.

What format of mentor training is available at your REU Site? At the 29 Sites that offer mentor training (required or optional), most offer the training in-person (26/29), but a few offer training online or via videoconference in place of or in addition to in-person training.

Approximately how much time does it take for a mentor to complete the mentor training that is available at your REU Site? At the 25 Sites that offer mentor training (required or optional), the time required is typically <1 hour (7/29) to 1-2 hours (12/29).

Please describe the mentor training available at your REU Site. For example, is a published curriculum used? A wide range of practices was reported, spanning from very informal to highly structured curricula. At some Sites, the REU personnel were not familiar with the training details because a centralized campus resource was used. The most common training reported was a team-based discussion of best practices; some of these best practices included setting expectations, identifying a research project, and communication techniques. The most commonly used structured curriculum is the work of Pfund et al. called *Entering Mentoring* [4].

References

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