BOARD #123: Work in Progress: The Impact of Informational Interviews on Career Choices and Professional Growth for Undergraduate Biomedical Engineering Students

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Introduction

Providing undergraduate engineering students with professional and career development opportunities early in their programs is crucial to post-graduation success. Students gather more confidence in their career choices, consider a wider variety of new specializations, gain an increased ability to connect in-class knowledge with practical experiences and enhance the invaluable skill of networking. To assist in preparing for these future professional experiences, students can conduct informational interviews to gain insights into the professionals' respective fields. Informational interviews are meetings with professionals in a specific field, career path, or industry to gain insights about their real-life experiences and further the interviewer's understanding of the profession.

Previous research has explored the use of artifact elicitation as a qualitative research method in engineering education, building on the principles of photo elicitation, where visual prompts are used to evoke more profound, reflective responses [1]. This method allows for more comprehensive insights than traditional semi-structured interviews, connecting participants' creations to their personal experiences. Artifact elicitation, similar to informational interviews, enables students to connect their theoretical knowledge to real-world contexts. This approach could provide a framework for understanding how student interactions, such as informational interviews, might elicit more profound reflections and personal insights.

Biases in technology, stemming from designers' perspectives, can harm marginalized populations, but integrating diversity, equity, and inclusion (DEI) principles in engineering education can address these issues [2]. One study focusing on systems engineering used semi-structured interviews with 15 professionals to explore how DEI principles can be embedded in education. The value of activities that go beyond technical skills is emphasized, encouraging students to reflect on broader social and professional contexts. Students can develop skills to recognize and address biases in engineering practices by allowing them to engage with professionals from varied backgrounds.

Another study argues that improving engineering student outcomes requires addressing key behavioral challenges directly. It advocates for a student-centered pedagogy that fosters critical success behaviors, such as determination, time management, collaboration, and professional engagement [3]. The results from this study indicate that experiential activities, like informational interviews and student-centered pedagogies, can help foster practical success behaviors, as students can better internalize incoming information through self-reflection.

In this study, students were assigned to conduct informational interviews with professionals in the biomedical engineering field, provide a self-reflection of these experiences, and submit a survey response to provide quantitative and qualitative data for further analysis. The students' responses will help determine the effectiveness of the interviews and highlight areas for improvement in future assignments. This research seeks to answer the question, "How do informational interviews impact undergraduate biomedical engineering students' professional growth, networking skills, and understanding of career opportunities?"

Methods
Student Assignment

Fifty-seven (57) biomedical engineering students were trained to conduct informational interviews by watching a LinkedIn Learning course, where they learned what informational interviews are, the benefits of conducting them, and how to perform them [4]. They were asked to find and contact five professionals in the biomedical engineering field and conduct interviews with these engineers. Students were then asked to submit a 1-page reflection describing their experience and completing a survey. The feedback gathered from the post-assessment surveys was intended to assess the efficacy of the interview process, pinpoint areas for improvement for this learning activity, and enhance the experience for future students. The University of Arkansas Institutional Review Board approved this study

Data Collection

　　　The self-reported data was collected through a survey comprised of three sections: demographic information, Likert Scale questions, and open-ended responses. The demographic section captured details such as age, race, ethnicity, sex, and first-generation college student status to differentiate participant backgrounds.

　　　The second section assessed the effectiveness using a series of Likert Scale questions (ranging from 1 = strongly disagree to 5 = strongly agree). These questions focused on themes such as understanding the field of biomechanical engineering, the value of informational interviews for personal and professional development, the influence of recent alumni perspectives, and the participant's ability to connect theoretical knowledge to practical applications. Additional questions explored challenges related to arranging interviews, participants' confidence in conducting them, and their overall satisfaction with the assignment.

　　　The open-response section was designed to gather qualitative insights on key takeaways from the interviews, challenges faced, the comparative value of alumni versus professional perspectives, the assignment's impact on career outlooks, and suggestions for future improvements. Initially, a user-focused analysis was conducted to identify common themes by frequency. Afterward, the responses were inputted into a generative AI software tasked to identify the top 3 themes for each question. These results were cross-referenced for accuracy.

Preliminary Results
Understanding of Career Opportunities

　　　Likert Scale questions assessed students' understanding of their career trajectories due to these informational interviews. Students reported having a better understanding of biomechanical engineering (Mean = 4.00) and were generally satisfied with conducting interviews to learn about potential career paths (M = 3.87).

Professional Growth

　　　Students were also evaluated on their self-described professional growth. Concerning conducting the informational interviews, students reported that the process was a valuable experience for their personal and professional development (M = 4.04) and contributed to their ability to connect theoretical knowledge with practical experiences in the field of biomechanical engineering (M = 3.79).

Networking Skills

　　　Since this interviewing experience is directly related to networking skills, the students were questioned about the efficacy of the interviews in this respect. The respondents reported incorporating insights gained from this experience into their future careers (M = 3.93). Students

also reported feeling prepared and confident in conducting these informational interviews (M = 3.82).

Qualitative Analysis

Both user-focused and AI-assisted thematic analysis of open-response questions provided initial insights into the effectiveness of the interviews. The most common themes identified by the generative AI for the open-response question are as follows: networking, interview scheduling, career awareness, and soft skills. These results aligned well with the user-focused analysis of frequency. The survey respondents reported the importance of networking and building professional relationships, emphasizing the significance of soft-skill development, which consists of effective communication and confidence. However, one challenge students faced was getting industry professionals to reply to their requests, primarily via LinkedIn and email. Most importantly, the assignment opened students' eyes to various career options within biomechanical engineering. Speaking with professionals helped students build confidence in their ability to succeed in their chosen fields, alleviating previous doubts about the profession. The interviews allowed students to gain valuable insight into job trends, providing an early view into the skills in demand and learning how to align their career development with current industry needs.
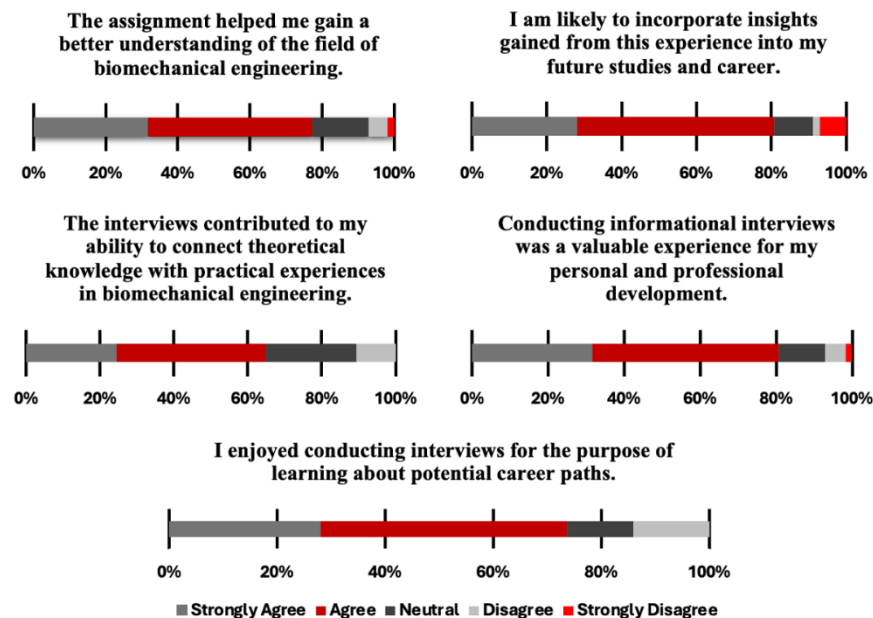

Figure 1: Comparison of five Likert Scale questions from the post-assignment survey (n = 57).

Discussion and Future Directions

This study contributes to engineering education by highlighting the benefits of reflective learning through informational interviews. Informational interviews give students a deeper understanding of the various career options available within biomedical engineering and help develop critical networking skills. By connecting their in-class knowledge with the work of the professionals, students could then identify emerging trends in the field and make more informed career choices. This assignment allowed many to explore new possibilities, gain confidence in their career choices, and better understand the skills they need to build to succeed in the field of biomechanical engineering. Despite these many benefits, one challenge commonly reported was

arranging interviews (M = 3.60), pointing to a need for institutional support. Participation and confidence could be positively affected by assisting students in arranging these interviews, but their networking skills may be impacted. Informational interviews serve as an impactful method of learning that provides students with the tools they need to succeed in their professional journeys. By refining this approach and addressing the challenges identified in this study, educators can maximize their potential and ensure students are well-prepared to thrive in a rapidly changing industry. Post-assignment interviews could be conducted to gather the professionals' perspectives on the process. These insights could provide researchers with a view into how students' interview approaches can be improved and how these interactions benefit professionals. Open-ended responses will be thoroughly examined using qualitative analysis software, like NVivo, to conduct a detailed thematic and sentiment analysis to gain deeper insights into student feedback.

References

[1] Douglas, E. P., & Jordan, S. S., & Lande, M., & Bumbaco, A. E. (2015, June), *Artifact Elicitation as a Method of Qualitative Inquiry in Engineering Education* Paper presented at 2015 ASEE Annual Conference & Exposition, Seattle, Washington. 10.18260/p.23574

[2] Rogers, Courtney & Valdez, Rupa. (2021). Designing for Diversity, Equity, and Inclusion in Systems Engineering Education. 10.18260/1-2--36929.

[3] Landis, R. B. (1997, June), *Enhancing Engineering Student Success: A Pedagogy For Changing Behaviors* Paper presented at 1997 Annual Conference, Milwaukee, Wisconsin. 10.18260/1-2--6548

[4] LinkedIn Learning, "Informational Interviewing," [Online]. Available: https://www.linkedin.com/learning/informational-interviewing. [Accessed: Jan. 12, 2025].