

# Workshop: A Narrative Approach to Broadening Schema about Engineering Professors

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**Abstract**—What images come to mind when you encounter the word “professor”? In many cases, our notions of a professor lead us to think of someone conducting research and teaching classes. However, our understanding of professors is in part limited by the professors we have been in contact with through our own educational experiences. Most people with PhD degrees attended a Doctoral University with Highest Research Activity, and therefore possess schema of professors in line with the professor at this type of institution. In this session, participants will be introduced to the narratives of twelve professors affiliated with institutions other than a Doctoral University with Highest Research Activity. These institution types include Baccalaureate Colleges, Master’s Institutions, Doctoral Universities with Moderate Research Activity, and Doctoral Universities with Higher Research Activity. Through the use of personal narratives, the experiences of twelve assistant engineering professors will be considered. Session attendees will gain a broader understanding of what it means to be a professor by studying the experiences of professors at universities with varying focus on research and teaching.

**Keywords** – *Faculty schema, preparing future faculty, narrative analysis, Carnegie Classification of Institutions of Higher Education*

## I. MOTIVATION AND SESSION GOALS

If you are a professor, think back to when you decided you wanted to be one. Did you base that aspiration on a professor you admired during your undergraduate years? Or perhaps you realized that you wanted to be a professor during your graduate studies, when you aspired to be like your advisor and/or other faculty members with whom you had opportunities to interact?

The field of engineering is somewhat unique in the academy, especially in comparison to many other fields, because most of its tenure-track and tenured professors (almost 65%) are at doctoral universities with highest research activity [1]. Most engineering PhDs are earned at this same institution type, which limits the schema PhD students are able to develop about what it means to be a professor. The term “professor” has become almost synonymous with “researcher,” especially at a doctoral university with highest research activity [2]. This emphasis on research is passed on to graduate students working to earn their PhDs at these same universities.

Schema theory, originally introduced by Piaget in 1926 [3,4], allows us to consider abstract ideas more simply. For

example, we all have schema about “a home,” which likely consists of a walled structure with a roof, doors, and windows. However, the more we learn about the concept of “home,” our schema are expanded to include more complex variations of “a home.” Similarly, our concept of “professor” is often influenced by the professors we have had contact with and have been able to directly observe in their roles. For most professors at research-intensive institutions, their own schema about professors likely includes a person who spends a lot of time writing grants, conducting research, fulfilling administrative or “service” duties, and teaching courses.

As mentioned above, most engineering graduate students earn their degrees at doctoral universities with the highest research activity. In these settings, graduate education typically focuses on developing graduate students to be excellent independent researchers. However, many graduate students seek to develop skills and pursue opportunities beyond research, including as related to teaching. Yet acquiring such skills in graduate school can be a difficult undertaking due to factors such as a lack of time, discouragement from one’s academic advisor, a lack of formal training opportunities, etc.

This special session aims to expand our collective understanding about what it means to be a faculty member at an institution of higher education. Through the use of narratives which detail the experiences of twelve assistant professors at four institution types, participants in this session will be challenged to expand their existing schema about faculty members. In particular, graduate students might realize that certain institution types are better aligned with the kind of professor they aspire to be, and current faculty members might additionally recognize ways they could better support the goals and aspirations of their graduate students. Additionally, all participants might better understand the varied experiences of assistant professors working in a wider range of contexts.

## II. DESCRIPTION OF RESEARCH

This session focuses on the experiences of twelve assistant professors through the use of a narrative inquiry research approach [5]. One 90 to 120-minute ethnographic interview [6] was conducted and audio recorded with each participant using Skype. All study procedures were conducted in accordance with Purdue University IRB protocol #1606017812.

The first author transcribed the audio interviews using the ExpressScribe Software and then identified critical incidents [7] in the transcriptions. The narratives were constructed based on these critical incidents, with first author's own words only used to improve clarity and flow. The transcripts were coded verbatim, except for the exclusion of crutch words and phrases such as "umm", "you know", any instances of stuttering, etc. Each narrative was also organized into major themes that are consistent across each narrative, but the narratives can be read individually or as a group. The four themes are: "How I got here," "My preparations for teaching," "My early days as a professor and what I am doing now," and "What tenure looks like here." Some narratives additionally have a fifth theme, "Other thoughts," for considerations that were important to include but did not fit within the other themes.

For this research, all participants were selected to have earned their PhD at a Doctoral University with the Highest Research Activity classification. This was intentional in order to highlight the misalignment between graduating from a Doctoral University that focuses primarily on research and being an assistant professor at an institution that focuses more on teaching. Additionally, since this study focuses heavily on pathways to such a position including associated preparation experiences occurring during graduate school, participants had to be within the first three years of their first assistant professor position. Details about each participant are included in Table 1.

TABLE I. OVERVIEW OF PARTICIPANTS

Institution Classification	Name (Pseudonym)	Gender
Baccalaureate College	Steven Bradley	Male
Baccalaureate College	Valerie Michaels	Female
Baccalaureate College	Opie Hampton	Male
Master's Institution	Samantha Reed	Female
Master's Institution	Christopher Davis	Male
Master's Institution	Jason Talbert	Male
Doctoral University Moderate	Brandon Oakley	Male
Doctoral University Moderate	Matthew Land	Male
Doctoral University Moderate	Moly Sanders	Female
Doctoral University Higher	Tyler Colton	Male
Doctoral University Higher	Richard Vine	Male
Doctoral University Higher	Emma Edgerton	Female

Additionally, the criteria for participation were as follows:

- Assistant professor seeking tenure,
- Employed at one of four institutional types: Baccalaureate College, Master's Institution, Doctoral University with Moderate Research Activity, or Doctoral University with Higher Research Activity,
- Within the first three years of first tenure-track faculty appointment,
- Fewer than three years of experience between doctoral conferral and start of faculty appointment, and
- Doctorate earned at a Doctoral University with Highest Research Activity institution.

Since this research is significantly concerned with participants' individual stories, the first author wanted to emphasize that the participants themselves know their story best. Similarly, the participants were encouraged to share the

aspects of their story that they viewed as important and relevant, rather than only the parts the researchers thought were most interesting.

Although the narratives are written in a first-person style, everything about that person was not captured. Each narrative is meant to convey the way in which they told their story. Direct quotations from the interviews dominate the narratives and the researcher's words that are used for deidentification, clarity, and flow are indicated by brackets.

Since the narratives were necessarily deidentified, the names of schools were changed to very generic versions that indicate when the participant was at that school. For example, each participant went to "Undergraduate University." The current university in which the participant is at currently is called "Current University." Each university is also described by its Carnegie classification the first time it is referenced in the narrative.

Once each narrative was constructed, each participant was contacted and asked to look over the draft and check for any inconsistencies or misrepresentations. The informants were also asked to share their thoughts regarding the incidents that were highlighted. The goal of these checks was to make sure the participants felt that the narrative represented their story accurately, both from a factual and emotional perspective. All the narratives were approved for publication by the informants, and all names, including institution names, have been altered to protect their identities.

As further illustration of this approach, an excerpt of one participant's narrative is included as an appendix.

### III. DESCRIPTION OF SESSION CONTENT

In this session, twelve narratives which detail the pathways to and experiences of assistant professors in engineering will be presented to attendees to read and consider.

As this session aims to expand participant's existing schema about professors, a survey will be administered at the beginning of the session. This survey will contain questions about participant's conceptions about professors, including perceptions of roles and activities. The survey results will be re-visited after participants engage with the narratives and will help facilitate conversations regarding how participant's schemas were expanded or challenged.

The narratives that will be examined were constructed by the first-author, however they were written in first-person from the perspectives of the informants. This was done intentionally, so that the narratives could act as the stories of more competent others [8], thereby conveying the stories of engineering faculty at institutions of varying research and teaching activity to current graduate students and faculty. Since the stories of people taking a path less traveled in engineering academe are not well known, each narrative was developed to stand alone and tell each informant's story, as well as to be comparable with other stories. As a result, readers will more likely connect with others' stories, and also see how the stories are similar to and different from one another as well as other stories of pathways and perseverance.

These narratives will be the focus of the session and are expected to provoke emotional responses and inspire future actions.

#### IV. JUSTIFICATION FOR NOVELTY

This special session will guide participants through the exploration of their own schema regarding faculty. By challenging participants to recognize their own schema and assumptions about professorial roles and careers, participants will be better equipped to navigate the academy and work with students and colleagues who are exploring and experiencing a wider variety of possible career pathways.

Additionally, participants will be introduced to a novel research approach through narrative analysis. Often, narrative analysis is used in order to help readers connect with the data. By having participants engage with stories told directly by assistant professors in engineering who are at various types of institutions, the workshop participants can develop deeper understandings of this research method by personally connecting with the narratives.

#### V. EXPECTED INTERACTION DURING SESSION

As the narratives shared in this workshop are fundamentally stories, this session will be very interactive and will encourage participants to share aspects of their own stories throughout the session.

#### VI. SESSION AGENDA

The session will run according to the plan given in Table II.

TABLE II. SESSION AGENDA

Time	Activity
0-15 min	Welcome and pre-session survey
15-20 min	Introduction to session goals and schema about professors
20-40 min	Participants come to front table and choose a narrative to read (short descriptions provided)
40-60 min	Participants will join another person who read the same narrative. With at least one other person, participants will discuss their reactions, emotions, and inspired actions in response to the narratives
60-65 min	Discussion of pre-session survey
65-80 min	Discussion about how participants' schema about professors have been expanded or changed and discussion about use of narrative research methods
80-90 min	Summary, reflection, and wrap-up

#### VII. DISSEMINATION

Following the session, the facilitators will further develop session materials for use in Preparing Future Faculty workshops for engineering graduate students interested in pursuing faculty positions. Since engineering graduate students in particular often lack exposure to institution types other than the doctoral university with highest research activity, these narratives might be used as an intervention to challenge the schema that many graduate students hold about faculty careers and life.

Sharing information about a wider range of options for faculty careers can additionally help address diversity issues in the academy, namely by raising awareness of alternative career pathways among historically underrepresented student groups. Awareness of such options might also spur graduate programs to explore ways to enhance teaching preparedness among their doctoral students. Such interventions are likewise well-aligned with diversity goals, and are more generally synergistic with efforts to enhance the quality of engineering education.

#### ACKNOWLEDGMENT

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#### REFERENCES

- [1] American Society for Engineering Education (ASEE). "2011 ASEE profiles of engineering and engineering technology colleges," [Data file]. Washington: ASEE, 2011.
- [2] The Carnegie Classification of Institutions of Higher Education. "About carnegie classification." Retrieved from <http://carnegieclassifications.iu.edu/>.
- [3] Piaget, J. "La représentation du monde chez l'enfant." Paris: Presses universitaires de France, 1926.
- [4] Piaget, J. & Cook, M. "The origins of intelligence in children." Vol. 8, No. 5, pp. 18. New York: International Universities Press, 1952.
- [5] Webster, L., & Mertova, P. "Using narrative inquiry as a research method: An introduction to using critical event narrative analysis in research on learning and teaching." New York, NY: Routledge, 2007.
- [6] Frank, C. "Ethnographic interviewing for teacher preparation and staff development: A field guide." New York: Teachers College Press, 2011.
- [7] Butterfield, L. D., Borgen, W. A., Amundson, N. E., & Maglio, A. S. T. "Fifty years of the critical incident technique: 1954-2004 and beyond." Qualitative research, 5(4), 475-497, 2005.
- [8] Chaiklin, S. "The zone of proximal development in Vygotsky's analysis of learning and instruction." Vygotsky's educational theory in cultural context, 39-64, 2003.
- [9] Flanagan, J. C. "The critical incident technique." Psychological Bulletin, 51(4), 327, 1954.

#### VIII. APPENDIX

Excerpt from narrative about Steven Bradley, assistant professor at a Baccalaureate College:

I wouldn't say it was a bad experience in grad school at all, like a lot of people. It was stressful at times, but I had a really good advisor, a really good understanding advisor, I did not feel pressure to be in the lab 24/7 like some of my colleagues who I noticed were, and I think he was a really good model in terms of work-life balance, especially as compared to some of the other professors I observed.

Even still, it's a balance, it's always sort of comparative. It was very good balance for R1 academia. And I – if this is the best case scenario, I'm really not sure this is the sort of life style I want to be in. Additionally, I was coming to realize that while I was fine at doing lab work, at taking a problem and figuring out how to do it, I wasn't really good at coming up with problems in the first place. Which meant that I didn't feel

confident in my ability to support myself through grants as my primary objective.

At the same time, I was realizing, what I really like about academia is helping people, helping students. And helping them to know the material first, but on a broader scale, helping them to know the field, to know life, to figure out what sort of career did they want. Somewhere halfway through is when I decided, you know, I like academia, I could probably go into industry and be fine, but it's not really what I feel passionate about. But at the same time, the R1 route is definitely not for me. That's when I decided to focus on getting in somewhere where I would be able to teach, where my primary responsibility was to teaching. As great as my advisor was, he didn't really have any advice for me, in terms of that career path. Through a couple conferences and what not, I did end up making a couple connections at teaching based institutions, and so I started to leverage them a little bit. Just like, "hey can you check out my teaching portfolio, can you give me some advice on what to look for in schools and interviews?" There was a course that was offered through the school of education at [PhD University], it was basically college teaching 101. That was really helpful. I had talked with my advisor and he suggested taking this course at [PhD University], so he was supportive of that. I found it very helpful and I did apply to a few positions. However, I wasn't sure, what sort of experience do these schools want you to have if you're going to be mainly teaching? So I did apply to a few schools, and then I did a year adjuncting, slash half post-doc.

So in the spring and early summer during [my first year of my post-doc], I decided what I need to do is get more experience teaching directly. Pretty much I looked at all the schools in the [area] and looked for any that had adjunct or part-time positions that they were advertising in chemistry, physics, engineering. Just to get something. And I did get one.

I started off teaching physics labs, they started me off slow. That first semester I was still doing a full-time post-doc as well, I had a lab section. I was able to carve out some time. That was really good. I was learning a lot about teaching. About – really a lot about student – interacting with students,

and dealing with students who were not really all that interested in being in the class. Because I had never had that experience myself. I mean, even if I didn't care about the subject matter, I still wanted to do good in the class – I still wanted to achieve as much as possible.

Overall, I was satisfied with how that went. In the meantime, I was continuing my job search, and by the time that semester ended I had interviewed here at [Baccalaureate College], and had accepted the job. The reason I ended up selecting it is because they offered me the job. And at the time, I didn't have another interview, and I had been on 11 campus interviews at that point, so I probably would have accepted just about any offer! The interview, I think was pretty typical of a lot of the interviews that I went on. It was one day. I had a teaching demonstration, they let me pick the topic.

I think that's just the difference in if the primary goal of your institution is to advance scientific research versus to graduate good educated engineers, that's going to come out in the people that you hire, in the way that your program is structured. But like I said, I felt pretty aware of that going in, so I wasn't really surprised to see that. I would say even more so at [Baccalaureate College], perhaps because it feels more of a community here. [When I was an adjunct, that institution] – they cater a lot to – they get a fair amount of people going back for degrees, non-traditional students I guess. [Baccalaureate College] is more, come here for four years, there's a monastic community on campus that is its own little – it's very communal in its nature anyway, and the faculty here – if that's not what you're looking for, you'll probably not end up staying here. The faculty, they are here because they like that sort of environment.