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Small Wins - Big Impact: Narratives from Behind the Scenes

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Dr. Long has taught undergraduates in the First-Year Engineering Program and Department of Mechanical Engineering at OSU and served as a facilitator for both the University Center for the Advancement of Teaching and Young Scholars Program at OSU. Furthermore, he has worked in industry at Toyota and has a high record of service with organizations such as the American Society of Engineering Education (ASEE) and National Society of Black Engineers (NSBE). To contact Dr. Long, email: Leroy.Long@erau.edu.

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Workshop – Small Wins, Big Impact: Narratives from behind the Scenes

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***Abstract* – All instructors, administrators, and researchers that have engaged in the endeavor to teach, oversee, and/or transform first-year engineering courses have a story to tell about their successes and struggles. In this workshop, we use narrative inquiry to listen to participants' stories about first-year engineering programs. Based on the analyses of these stories and deduced patterns, a few key struggles will be teased out to guide this interactive workshop. All participants will then further tell their stories of relevant experiences. Our goal is to address struggles and disseminate successes with first-year engineering programs for adoption and adaptation. Our goal is that all attendees will leave this workshop with a better understanding of their own stories and key takeaways that they can apply to first-year engineering programs at their own institutions.**

Index Terms – first-year engineering programs, narrative inquiry, storytelling, student retention and academic success

OVERVIEW AND GOALS

Engineering departments are continuously focusing on institutional transformation efforts with lasting impacts to improve the quality of education and the success of undergraduate students. First-year engineering programs are often times a focus of these efforts as they are at the forefront of issues concerning the transition from high school to college, retention of all students with emphasis on populations that are traditionally under-represented in engineering, and developing the foundational engineering knowledge and skills [1]-[4]. Through these efforts, many engineering programs have implemented small incremental changes that have resulted in positive lasting effects. Due to the importance of context of these successes, this workshop utilizes narrative inquiry [5] to develop a deeper understanding of problems common to first-year engineering programs and viable solutions that other institutions can easily adopt.

Participants will share their own and listen to others' stories about triumphs over and mitigation of common problems faced in first-year engineering programs. These narratives will ideally enable participants to better understand the impact and meaningfulness of their own successes and determine solutions for some problems they still face through others' stories of triumph. Using these narratives, the facilitators will begin to identify common themes and key features to participants' solutions and successes. At the conclusion of the workshop, facilitators will generate info-graphics that will be distributed to both participants of the workshop and other FYEE attendees.

BACKGROUND

This workshop is centered around first-year engineering experiences. First-year engineering curriculum vary across institutions, but research primarily promotes the use of some type of problem-based learning, hands-on projects, or design problems over lecture-style learning environments [2],[3]. The goals of most first-year engineering programs are to increase retention, broaden participation, and develop fundamental knowledge to help prepare engineering students for the remainder of their undergraduate education [1]-[4].

A goal of this workshop is to walk away with meaningful stories of one's own experiences and others' experiences. Narrative inquiry will be used to share participants' stories about solutions to problematic challenges. Another goal of this workshop is to provide meaningful info-graphics to remind the participants and inform other conference attendees of some key successes identified in the workshop. The facilitators will capture the stories and conversations of the participants throughout the workshop, while identifying patterns and key points through grounded theory.

I. Narrative Inquiry

Narrative inquiry is most commonly utilized within the constructivist paradigm, critical race theory, or feminist theory [5]. The purpose of narrative inquiry is to capture narrative knowledge or individuals' lived and told experiences as opposed to paradigmatic knowledge [5]. Paradigmatic knowledge is traditionally a more highly valued knowledge that is characterized by the logical-scientific mode [5]. While not as esteemed, narrative knowledge is not inferior and it is commonly used in everyday life; it is about the stories that people use to make sense of their lives in visual, written, and oral form [5].

Narrative inquiry is used to investigate individuals' stories of their life experiences to understand some phenomenon being studied and/or facilitate social change [5],[7].

The data for this workshop will be generated through participants' stories and their conversations. In addition to the participants' contribution, the facilitators will be documenting observations and field notes, which will contribute another perspective to the data. Storytelling, conversations, and field notes are a few methods for collecting storied knowledge [6].

II. Grounded Theory

Narratives are their own meaningful form of disseminating findings that result from narrative inquiry [5]. To highlight key successes and protect the anonymity of individuals in the workshop, the stories told in this workshop will be summarized through grounded theory.

Grounded theory uses open and axial coding to develop categories of information and interconnect them [8]. Open and axial coding will be used to analyze the facilitators' field notes of participants' stories. The focus of the coding will be to tease out categories of successes and how they connect.

WORKSHOP AGENDA

The workshop will begin with a few problems critical to the success of first-year engineering programs based on stories submitted by faculty, administrators, and researchers prior to the workshop. Participants will then tell in-depth stories of their experiences with each problem and their approaches to solutions. Using these narratives, the facilitators will begin to identify common themes and key features to participants' solutions and successes. The details of this workshop agenda are as follows:

I. Welcome – Introductions to Facilitators, Participants, and Workshop Goals (5 minutes)

All of the facilitators will briefly introduce themselves by sharing their name, title, and a brief summary of their experience with first-year engineering programs. We will then ask participants to introduce themselves by sharing the same information about themselves. We will then introduce the goals of the workshop.

II. Identify Key Problems with First-Year Engineering Programs and Disperse into Small Groups (10 minutes)

A few key problems unique to first-year engineering programs will be defined by the group. Each of these problems will then be the topic of discussion for a group to further define the scope of those problems. The participants will be prompted to join a group to share or listen to others share their experiences about one identified problem that interests them most. The participants will be informed that they will have an opportunity to participate in two groups throughout the course of the workshop and they will hear a summary of key takeaways for all of the identified struggles after the two group discussions.

III. Storytelling in Small Groups (25 minutes)

Within small groups of 3-5, participants will be given an opportunity to tell a story of how they faced a related problem. The first 20 minutes will be time for participants to tell their stories. The facilitators will play timekeeper roles ensuring no one participant takes over the conversations. The facilitators will also document observations about key points to successes and patterns across stories through a grounded theory approach. The last five minutes of the small group discussion will be designated for collecting final thoughts and highlighting key ideas that participants are taking away from the discussion. Facilitators will use this information to further identify or compare the major themes they noted throughout the discussion.

IV. Redistribute into New Small Groups to Address a Different Key Struggle (5 minutes)

After the first groups are completed, the participants will be prompted to go to a new group to discuss another key struggle (based on the ones initially presented). The locations and facilitators for the groups will remain the same to prevent confusion of where different struggles will be discussed and enable facilitators to further their field notes on the same topic.

V. Storytelling in Small Groups (25 minutes)

Newly formed small groups will be organized in the same manner as the first storytelling groups. The facilitators may further formalize the order or timing for participants' storytelling within the first 20 minutes based on their experience with the first groups. The last five minutes will be again for more summative and reflective discussion.

VI. Summarizing Key Takeaways (10 minutes)

To summarize the workshop, one facilitator from each group will present a summary of key ideas for their corresponding topic. Upon completion of the workshop, the facilitators will collaboratively analyze their field notes to develop info-graphics further summarizing key themes to disseminate to the participants and other conference attendees.

INTENDED AUDIENCE

The intended audience for this workshop includes faculty, administrators, and engineering education researchers who are involved in the development, implementation, and/or transformation of first-year engineering courses and/or programs. This workshop will also be beneficial for faculty, administrators, and researchers that intend to begin working with first-year engineering courses and/or programs. All disciplines are welcome to attend. Our goal is continuous

innovation and we welcome all perspectives to promote creative thinking and change.

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