

# Academic coaching tools for increased retention: empowering engineering students in their education

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**Abstract**—What skills can we use to help undergraduate and graduate engineering students to set and work toward their own goals, to take charge of their education and career path, and to hold themselves accountable all without adding more to the workload for faculty and support staff? Learn how to empower engineering undergraduate and graduate students to own their education, utilizing tools in coaching. Inherent in the structure of coaching is the engineering design process: identify the underlying problem, explore solutions, and create an action plan. Using coaching skills with students you advise, teach, mentor, supervise, etc. can be a valuable tool for inspiring critical thinking and self-reflection and for improving student retention.

Drawing parallels to the success of coaching in business, coaching tools can be used in higher education to empower students in professional and academic skills, as well as in areas relevant to a successful engineering career (e.g., taking initiative, embracing risk, innovation skills). In the case of underrepresented groups in engineering (e.g., women and by ethnicity), a coaching approach can help these populations see negative assumptions they might be making about themselves that are actually a result of cultural/societal norms or implicit bias at work. With that understanding the student can then progress with the coach to come up with goals and action plans to persist in spite of bias.

Workshop engagement consists of definitions of and research behind coaching, a sample coaching session, and introduction to coaching tools. Small group discussion and coaching practice with peers is integrated throughout. Workshop activities and materials are drawn from research in fields of education, psychology, diversity and inclusion, and brain science, and from the practice of coaching in business and education contexts.

Participants in this highly interactive workshop will: (1) Learn about and practice coaching skills to help you grow as an educator, leader, mentor, supervisor, director.; (2) Practice formulating thought-provoking questions and improving listening skills; (3) Draw parallels to inquiry-based learning and design procedures prevalent in STEM fields to help to foster problem-solving and critical thinking skills in students; (4) Identify specific ways that you can adapt and use coaching strategies in your higher education roles and everyday life.

In aligning with FIE goals, this workshop will combine an innovative educational approach for engineering with research from diverse fields. Higher education is on the precipice of involving coaching strategies beyond a subset of academic advisors trained in some coaching skills (known as appreciative advising). Engineering Education can be a front-runner in embracing coaching approaches and skills in teaching, advising, and mentoring of our students. This workshop also embraces the FIE philosophy of sharing ideas, learning about developments and interacting with colleagues in these fields.

## I. QUALIFICATIONS OF THE PRESENTER

Dr. Groh received a B.S. in microbiology from Purdue University, and a Ph.D. in microbiology from the University of Oklahoma. As Associate Director of the Purdue Women in Engineering Program (WIEP), Jennifer develops, implements, and assesses peer mentoring programs (400 students) and two Women in Engineering seminars (200 students). She also directs engineering outreach programming to over 3000 pre-college students annually. Dr. Groh has invested over 100 hours of training to become a certified Affiliate Coach with LifeBound, Inc. with a specialized focus in serving STEM populations. She facilitates national workshops which have been well received by audiences including undergraduate and graduate students, faculty and staff, and corporate representatives. Recent workshops include the 2015 FYEE conference, the 2015 Women in Engineering ProActive Network conference and Purdue College of Engineering faculty and staff workshops. Dr. Groh integrates coaching into WIEP programming, courses and student mentoring and conducts research on the integration of coaching into engineering education, retention and diversity initiatives.

## II. WORKSHOP AGENDA

45 min Opens with discussion of what participants can gain and what expectations do audience members have for the workshop. A brief background to coaching includes an overview of relevant research literature. Introductory material includes discussion with participants to gauge/expand their knowledge on coaching vs. mentoring, followed by the coaching process: Analysis of Challenge, Creative Solutions, Practical Steps. Other important components of coaching include Listening and Powerful Questions (including a listening skills assessment to gauge participants current levels of active listening), Acknowledging and Accountability.

75 min - After the basic introduction, I demonstrate coaching with a volunteer graduate student audience member. Participants will discuss in small groups what they observe about this demonstration before reporting back to the group as a whole. After debriefing, participants will use what they have learned to practice coaching with fellow participants in pairs. We will follow this exercise with a debriefing on what the experience was like to coach and be coached.

60 min - Concluding activities will include a coaching exercise in trios, where each member of the group rotates

serving as the coach, the person being coached, and an observer who will provide feedback to the coaching pair following each round of coaching. Finally, we end the workshop with think-pair-share discussions of how academic coaching tools and methods could be used in participants home organizations to better serve engineering students and underrepresented groups in engineering. I will then share how Purdue and other universities are using academic coaching to increase retention of engineering students.

### III. ANTICIPATED AUDIENCE

This workshop is applicable to any faculty, staff and graduate students who are interested in learning coaching skills to apply in any one or more of these roles: course instructor, research advisor, academic advisor, mentor, supervisor, director, etc. Information presented and practiced is useful for those new to their current role to those who are more experienced. There is no maximum limit on attendance.

### IV. PRESENTATION REQUIREMENTS

Electricity, projector and projection screen, white board or flip chart and markers, wi-fi access.

### V. ANTICIPATED FEE FOR ATTENDEES

\$75 - 100 per person with special rates for students and retirees. This rate is also flexible in discussion with FIE leaders to meet expectations of attendees.