

GIFT Paper: Potential Mechanisms to Assess the Ability for Engineering Students to Communicate Effectively to a Range of Audiences

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Dr. Assadollahi is a native Memphian and a 2005 graduate of Christian Brothers High School. Dr. Assadollahi earned a B.S. in Civil Engineering with a concentration in structural engineering from Christian Brothers University in 2009. He also earned a B.S. in Mathematics from Christian Brothers University in 2009, concentrating in applied differential equations. He earned a M.S. in Civil Engineering from The University of Memphis in 2010 with a concentration in structural seismic engineering. Dr. Assadollahi completed his Ph.D. in Engineering from The University of Memphis with a concentration in geo-structures in 2013. He currently an Associate Professor and Department Chair of Civil & Environmental Engineering at Christian Brothers University. He is a registered professional engineer in the State of Tennessee.

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Professor McGinnis is an Associate Professor in the Department of Civil and Environmental Engineering at Christian Brothers University in Memphis, Tennessee. He has thirty-six years of experience teaching engineering courses. He has taught thirty-one years at Christian Brothers University. He teaches courses in Transportation Engineering and Construction Engineering. Required courses include: Civil Engineering Graphics, Geomatics and Lab, Construction Materials and Lab, Highway Engineering and Engineering Economy. Elective courses include: Traffic Engineering, Heavy Construction Equipment and Methods, Construction Cost Estimating and Cost Control, Construction Management and Planning and Scheduling. He is a registered Professional Engineer in the State of Tennessee. His professional experience includes bridge inspection and evaluation, roadway and interstate design, traffic planning and the design of earth-fill dams. He is the Past President of the America Society of Civil Engineers West Tennessee Branch. He serves as the Treasurer for the Memphis Area Joint Engineers Council. He serves as the faculty advisor for Tennessee Delta Chapter of Tau Beta Pi, the national engineering honor society and as the faculty advisor for the student engineering fraternity Theta Tau. Professor McGinnis served fifteen years as the Department Chair in Civil and Environmental Engineering. He is also served as an Adjunct Professor at the University of Memphis teaching a class in Construction Engineering.

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Introduction

According to ABET Criterion 3, student outcome (3) states that students must demonstrate “an ability to communicate effectively with a range of audiences” [1]. The re-wording of student outcome (3) has led to some uncertainty on appropriate mechanisms to assess this ability. In this research, three potential mechanisms to assess the ability of students to communicate effectively to a range of audiences are presented. In all assessment mechanisms, each audience member is provided the same evaluation rubric to assess the student presentations and must include their area of expertise with their professional background. Student teams are instructed to structure their presentations in such a way that non-engineering audience members can understand the scope of work. Part of the assessment by audience members includes how well the students delivered the information to the non-engineering audience members.

Assessment Mechanisms

Assessment Mechanism A was implemented in the Fall 2019 semester in a civil engineering junior project course. At the course conclusion, student teams are to submit a proposal document to faculty members and a company sponsor for their upcoming senior design projects. This proposal document is assessed by faculty members and civil engineering practitioners from the company sponsor. In addition, student teams are required to give an oral presentation to an audience from a variety of backgrounds. This includes their peers, faculty members from all engineering departments, faculty members from the Literature and Languages Department, the Marketing Department, various staff members of the university, and engineering representatives from the company sponsor. Assessment Mechanism B was implemented in the Spring 2020 semester in a structural analysis course. This assessment mechanism requires students to give an oral presentation on projects to the course instructor, non-engineering faculty members, and fellow class peers. Students are assessed based on technical aspects of the project along with their professional delivery of the material. The student teams are video-recorded and must re-watch their own recorded presentations and critique themselves for self-improvement using a provided rubric. Assessment Mechanism C is planned to be implemented in the Fall 2020 semester. This includes the same requirements as Assessment Mechanism B but with the addition of the students and instructor traveling to a local high school and presenting the project material to high school students and teachers. Beginning the Fall 2020 semester all three assessment mechanisms will be implemented into an Introduction to Civil Engineering course. Upon full implementation in Fall 2020, data will be collected, analyzed, and presented in future research, including analyzing the success and validity of these mechanisms and results of these implementations.

References

- [1] ABET Inc. “Criteria for Accrediting Engineering Programs, 2019-2020” ABET, Inc., Baltimore, Maryland, 2018, <<https://www.abet.org/accreditation/accreditation-criteria/criteria-for-accrediting-engineering-programs-2019-2020/#GC3>> (May 13, 2020).