

Assessment of Project-Based Effective Learning in Transportation Engineering

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Abstract

The primary purpose of this study was to quantify the performance of a collaborative project-based active learning technique designed for selected civil engineering students. It was hypothesized that students' learning would improve through meaningful exposure and engagement in solving real-world engineering problems. The learning outcomes of students were assessed through a thorough evaluation of answers to a set of questionnaires administered before and after the effective learning along with individual written reports. Before the pre-test, students were exposed to traffic safety-related problems of the premises of a selected elementary school through traditional classroom-based learning tools and techniques. The post-test phase of assessment was conducted after the same group of students was allowed to see the real-world conditions through field trips. Afterward, two-dimensional assessments, question-based improvement, and level of learning using Bloom's taxonomy were conducted to quantify the level of improvement of students' learning. The written report also showed a significant improvement in defining, formulating, and solving engineering problems after the students conducted field trips in group settings. The findings of this study are expected to help engineering researchers and educators in developing models and frameworks of project-based effective learning.

Keywords

Project-based learning, Pre-test, Post-test, Traffic safety, Bloom's taxonomy, Effective Learning.

Biography

Zahid Hossain is an Associate Professor of Civil Engineering at Arkansas State University (ASU). He has over ten years of experience in research and scholastic activities, with an emphasis on the development and characterization of sustainable concrete and geotechnical materials using various waste materials and nano-fillers through mechanistic and surface chemistry approaches. Dr. Hossain's research has been supported by various federal, state, and local agencies that include the National Science Foundation, the US Department of Transportation, and the Arkansas Department of Environmental Quality. Among different awards of Dr. Hossain, the 2019 ASU Faculty Award for Advising, 2014 Ralph E. Powe Faculty Enhancement Award from Oak Ridge Associated Universities, and the 2013 ASU Faculty Award for Scholarship are noteworthy to mention. Dr. Hossain has coauthored over 60 peer-reviewed journal articles and 70 refereed conference papers. Dr. Hossain has served in various capacities (Editor, Reviewer, and Member) of several international and national level professional journals, symposia, academies, and scientific boards. Dr. Hossain is a Professional Engineer in Arkansas.