



Active Learning Improves Understanding of an Earth Structural Design

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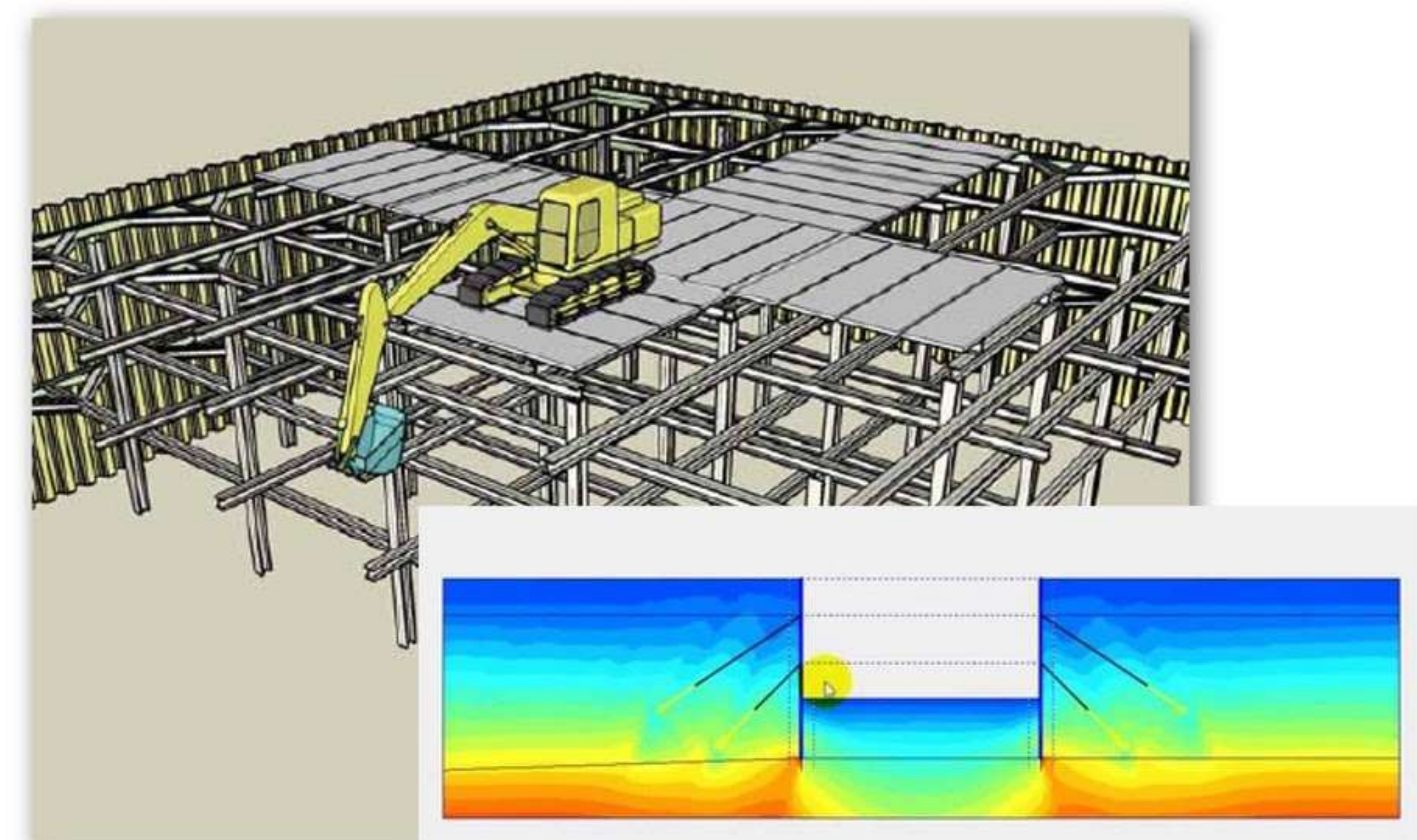
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Overview

In 2018, I taught Earth structures course with lecture-based learning. I assigned a homework every weeks. However, the results seemed to be disappointed. In 2019, I applied a concept of projected learning in my lecture to promote student engagement. Technologies, such as computational program, social media, and social networks are incorporated into the activity, to increase student engagement. As resulted, it provided not only save to assess my time to assess my student knowledge, but also improve their technology skills. This skill is essential for working collaboratively online and life-long learning.

Aims and Objectives

Earth structures (CVE59-431), for 4th year students. Designing the course to meet the outcome of TQF2 and Bloom's taxonomy, I expect cognitive skill of understanding, applying, and evaluating. The students correctly be able to select soil parameters for designing retaining structure and can evaluate the stability of retaining structure



Activity

Teaching methods based on active learning approaches such as lectured based, demonstration method, and projective based learning. I started with lectures to provide the students with the core knowledge. I showed worked examples and let student practice doing some basic calculation and analysis of reinforced earth structure components. In the 5th week, I invited an external speaker into the classroom. It is to give student a better insight into the design and analysis of reinforced soil structures form a professional practitioner. During the first five weeks (week 1-5), the core knowledges of course were carried out by lecture-based learning. On the other hand, at the end of class, the homework for students to solve problems with hand calculation were assigned to assess student's identifying the key parameters of soil and understanding the key concept of the day. In the 6th week, the students were divided into 6 groups with 5 students per group. I assigned different real-problem projects to each group. Within six weeks (week 6-12), the students had to use the basic knowledge for design the reinforced earth structures. The computer program called "PLAXIS" were used to simulate the behavior of the reinforced soil structures. Doing group work encouraged peer to peer teaching, the students checked the design by hand calculation. I observed that students were excited to solve real problems using the professional tools. Finally, the student presented the project work to classroom. The questions were encouraged to be discussed after presentation. The students looked exchanging discussions with other group members. I still used formative and summative assessments to measure cognitive skill of understanding, applying, and evaluating. Once they submitted their work via online, I usually gave personal-feedback and solution within a day. These formative assessments are used in re-align my teaching in response to learners needs. For my teaching, I often used the lecture room that it could adjust the chairs and tables to make the open space for active learning activities. To build a positive classroom environment, the classroom seat arrangement is changed according to the activities in each section (Silberman Mel 1996).

Outcome

After using the active learning, I found that students were more active and had a desire to participate in teaching and learning process as they wanted to know what happened next in my lecture. Students get average scores of 65/100, which was 10% better than the previous years.

Impact

I found the new trends toward learning and teaching in higher education. Moreover, I used about Smart classroom, Socrative, and eLearning systems which were adopted in CVE59-431. As resulted, it provided not only save to assess my time to assess my student knowledge, but also improve their technology skills. This skill is essential for working collaboratively online and life-long learning.

Future development of project

Being a lecture in higher education, I am always learning and growing my attainment to keep my professional career. In recent years, I participated in training and seminar about teaching and learning developments.

References

Silberman, Mel 1996 "Active Learning: 101 Strategies To Teach Any Subject", Prentice-Hall, P.O. Box 11071, Des Moines, IA 50336-1071