Computer Assisted Classroom Participation

Keith J. Francis
Colorado State University
keith83@rams.colostate.edu

Cam Nagel
Colorado State University
camnagel@colostate.edu

Jewett Lane
Colorado State University
jewett@rams.colostate.edu

Introduction

- We created a new platform for use in the classroom to assist instructors during teaching of new material.
- The platform is web based to allow easy of access
- Currently, the platform is fully customizable by instructors who know basic coding.
- Our platform is based on the study-test model
- Designed to increase student participation in the classroom

Motivation

Education is a major contribution to ones life. Dealing with the constant struggle to learn new information as quickly as possible leads to complications for students.

Multiple studies have been conducted in order to find better ways for teaching that can directly improve the learning curve for students. One method that has proven true in research is the study-test model in which students study the material then test on that material shortly after. This is a form of reinforcement learning that has yet to be adequately installed into the classroom environment.

Literature Review

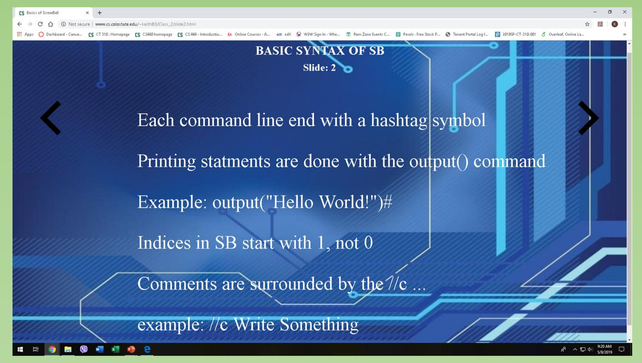
Studies have found that major contributors to someone's psychosocial filter include confidence, trustworthiness, credibility, and approachability [1]. To build from this, another study determined that there are three aspects of online web courses that are problematic for effective learning, and reduce the trustworthiness and approachability of the learning medium [5]. Over a period of 51 years, studying the educational system has shown that students learn best through classroom engagement, as shown through their increased gpa and ability to apply what they learned [10]. The use of classroom response systems over the past several years has also demonstrated that classroom involvement can provide significant improvements in learning [6]. In this study, the authors sought to answer the question of how to define effective e-learning, how to measure it, and what constitutes an effective e-learning solution [9]. In regards to web-based computing education, one attempted study involves adaptive and intelligent web-based education systems [3]. Another study on educational game design for online education attempted to establish an effective and reliable form of web-based education using games as the framework [4]. Another study related to the analysis of the adaptability of e-learning platforms focused on how closely these platforms could meet the needs of its students and was necessary due to the relatively small amount of coverage this topic receives [7]. One study that closely mirrors the objectives of this project was conducted by J. B. Arbaugh et al. on the most effective social and systematic methods of learning in online environments. This study created two frameworks, objectivist and constructivist, and conducted two different sessions with online learning environments centered around one of the two teaching frameworks [2]. A second similar experiment by S. C. Ng et al. implements this objectivist framework in a computer oriented online learning environment. The goal of this study was to produce an interactive, feedback and practice oriented application to greatly improve computer programming course retention [8].

Study

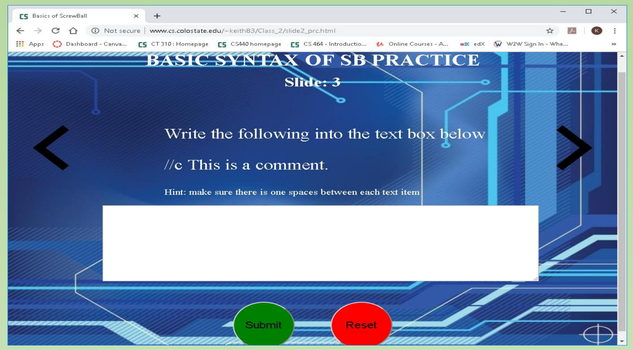
- The study was conducted as a between groups study.
- A total of 22 participants (11 participants for each group)
- Control group was given only the teaching slides
- Test group was provided the 3-Phase learning slides

3-Phase Learning View

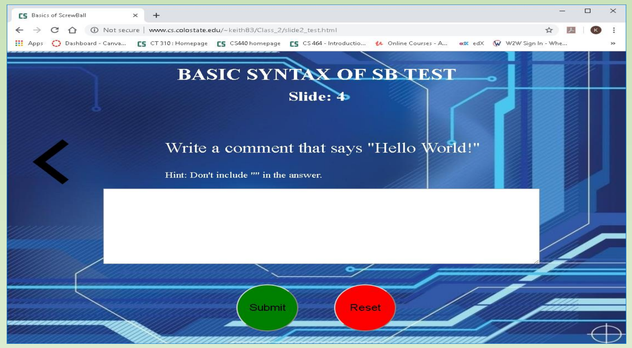
- Learning Slide presents the information



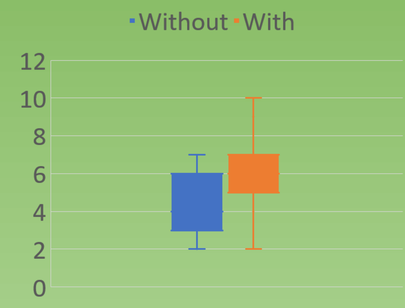
- Demonstration slides teach use of information



- Testing slides force user to recall information and use from memory to continue



SVM Results



Part #	Without	With
1	2	2
2	7	5
3	2	7
4	5	10
5	4	4
6	6	7
7	3	5
8	5	7
9	4	5
10	6	9
11	3	6

- Mean with 3-Phase: 6.09
- Mean without 3-Phase: 4.27
- T-test indicates significance with $p<0.05$

Future Work

- Develop into a full program
  - To be useable anywhere and anyone
- Ease of page creation
  - Use code to pull information from text file
  - No coding required from instructors
- Local database setup
  - Record number of attempts on test slides
  - Record student participation using ID

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Contact: Keith83@rams.colostate.edu or Camnagel@colostate.edu or Jewett@rams.colostate.edu

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