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Experiences in Teaching and Learning

Evaluation of students' perceptions of the Socrative application versus a traditional student response system and its impact on classroom engagement

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ABSTRACT

Background and purpose: Student response systems (SRSs) or "clickers" are common tools that lecturers can implement into didactic lectures. Socrative is a convenient and free SRS application that can be downloaded on personal handheld devices and used by faculty and students. It is unknown if students prefer using this application and what advantages or disadvantages can be seen with Socrative's use.

Purpose: To measure student preference of standard SRS methods compared to Socrative as well as the impact of Socrative use on student engagement during delivery of clinical pharmacy instruction

Educational activity and setting: Standard SRS and Socrative incorporated lectures were presented to students during an infectious disease module. Students were given a survey at the end of the semester to determine the primary endpoint of preference for each application. The survey used a Likert scale of 1–5, with 1 = strongly disagree and 5= strongly agree. Secondary endpoints included assessing the number of questions asked, participation, and classroom time utilized.

Findings: A total of 114 surveys were completed and six were excluded due to discrepancies or reporting bias. A higher mean scoring for classroom facilitation of active learning (4.48 vs. 3.99, $p < 0.0001$) and student-reported active participation in class (4.45 vs. 3.60, $p < 0.0001$) was found for Socrative compared to SRSs, respectively.

Summary: In comparison with traditional SRS methods, students felt Socrative helped them to more actively participate in class and facilitated a better environment for asking and receiving answers to classroom questions.

Introduction

The Accreditation Council for Pharmacy Education standards recognize that implementation of active learning to enhance critical thinking is an essential component of pharmacy education.[1] Active learning strategies stimulate student engagement and application of content in comparison with traditional lectures which promote a more passive listening environment.[2] Unfortunately, many

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students experience apprehension or anxiety to participate or ask questions in front of their peers, particularly in the large classroom setting. This participation anxiety has the ability to diminish student participation while hindering overall learning.[3]

Student response systems (SRSs), also known as "clickers", have been utilized in pharmacy education to pose questions during class and provide immediate feedback to both facilitators and students.[4,5] Advantages of SRSs include providing opportunities to address misinterpreted content and encouraging participation through complete student anonymity.[5] These systems have classically required software integration into PowerPoint presentations as well as for students to purchase a separate handheld device to bring to class for use. A new electronic application ("app") called Socrative (MasteryConnect, Salt Lake City, UT) can be downloaded and accessed directly by personal handheld electronic devices such as a smartphone or tablet, which students commonly use throughout the day, or can be accessed directly online via socrative.com;. The Socrative application is free to the public and utilizes an internet connection rather than conventional radio signal receiver units. This application enhances the opportunity to provide immediate feedback to the learner through comments posted on their device immediately following their response to the question posed.

The Socrative application has the added advantage of functioning as a backchannel tool, characteristically a forum that allows students to pose real-time questions to an instructor when lecture content is being covered. Although data regarding effectiveness of backchannel tools is limited, pilot studies have reported positive increases in student engagement and interaction in the classroom.[6] The anonymity and simplicity of this process is thought to appeal to more introverted students and could possibly reduce participation anxiety.

The Socrative interface is easy to navigate for faculty to create questions and quizzes used for backchannel forums and active learning exercises in the classroom. Use of SRSs within clinical pharmacotherapy lecture delivery is particularly valuable for teaching clinical application of didactic lecture material, often in the form of case-based studies.[7] The aim of this study was to measure student preference of SRS method as well as the impact of Socrative use on student engagement during delivery of clinical pharmacy instruction.

Methods

A quasi-experimental study was conducted at the Duquesne University Mylan School of Pharmacy. Institutional Review Board approval was obtained prior to study initiation.

This study was conducted during the Spring 2016 academic semester. The Infectious Diseases Module course is a 2-semester sequence course (six credit hours total) that is taught in the second year of the professional Doctor of Pharmacy curriculum. The course structure is relatively integrated, blending elements of pharmacology and medical chemistry with core clinical pharmacotherapy content. The Spring 2016 class of 169 students met four times weekly. This study measures the use of SRSs within the clinical pharmacy portion of the course (approximately two credit hours total).

The SRS methods were employed during active learning case studies that incorporated lecture content. Throughout the same course, six therapeutics lectures consecutively utilized the conventional SRS technology TurningPoint (Turning Technologies LLC, Youngstown, OH, http://www.turningtechnologies.com), while six following lectures utilized the electronic application Socrative (http://www.socrative.com). During the Socrative utilization period, a Socrative backchannel tool forum was initiated at the start of the lecture to allow students to type in questions throughout the lecture in a real-time manner (Fig. 1) in comparison with hand-raising for the traditional SRS period. The instructor checked the question forum at the end of the lecture to address and answer all questions.

Students' preference of SRS method was the primary objective of this study based on previous data indicating positive impact of multiple SRS methods for student engagement.[5] A survey containing eight Likert type questions was used to measure students' opinions regarding the two different SRS methods used in the course. Items were measured using a scale from 1 = strongly disagree to 5 = strongly agree (Fig. 2). Two student volunteers not enrolled in the course distributed anonymous paper surveys for completion at the end of the semester. Secondary endpoints for this study include describing the number of questions asked during class periods stratified by teaching methodology, overall participation in SRS active learning exercises, and classroom time utilized for addition of

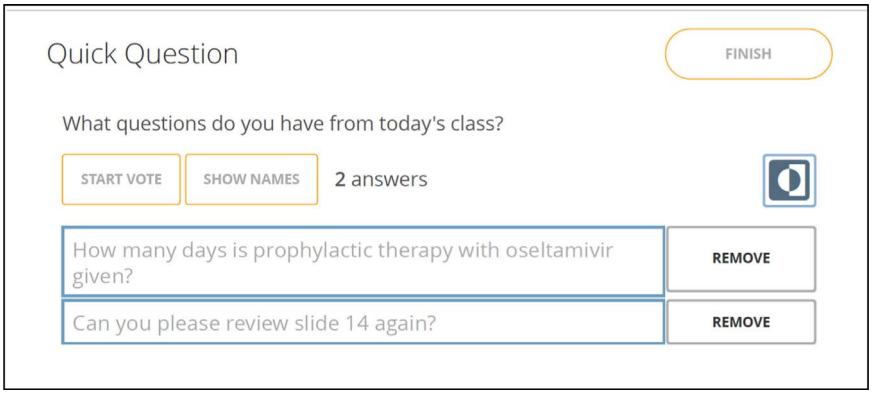

Fig. 1. Screen shot of sample Socrative backchannel poll and student questions during class.