

Big Brother is Watching...Utilizing Split-Screen Technology to Enhance Teacher Efficacy

Introduction

The preparation of agricultural teachers is the central mission of post-secondary agricultural education departments (Barrick, 1993). Stripling et al. (2008) suggested that the success or failure of agricultural teachers could be dependent upon the teaching efficacy skills developed as part of the pre-service teaching program. One method that has been shown to enhance teaching efficacy skills is the utilization of video, more specifically the integration of split-screen technology. Split-screen technology provides pre-service teachers the opportunity to simultaneously observe teacher actions as well as student reactions.

Martin-Reynolds (1980) determined that videotaping has become recognized as a valuable multidimensional tool for purposes of self-evaluation for teachers. More recently, Zhang et al. (2010) concluded that video recording's ability to capture elusive classroom behaviors that go unseen by the teacher was viewed as a powerful tool to support teacher learning. Playback ability provides the opportunity to see the verbal and non-verbal communications that are present between the students, and allows the teacher to enhance their lessons.

Video recording has been used in a variety of ways to help pre-service teachers enhance their teaching ability. According to Sherin (2004), video has been used in teacher preparation programs for microteaching, modeling experts, lesson analysis, and video-cases. Video recording allows pre-service teachers and mentors to "...replay classroom events and notice aspects of classroom situations that they are too busy to notice while teaching" (Zhang et al., 2010, p. 61). In a study of pre-service mathematics teachers, Star and Strickland (2007) concluded the use of video in pre-service teaching methods courses increases teacher observation skills, specifically the ability to notice features of the classroom environment.

Procedures

Iowa State University uses split-screen technology that allows the user to record the agricultural education classroom from two vantage points simultaneously on one screen. Split-screen technology allows for simultaneous dual analysis of the lesson from teacher and student perspectives. The pre-service teacher has the ability to reach a deeper understanding of agricultural education classroom dynamics by viewing multiple vantage points within the classroom. This technology includes a video recorder that saves directly to a USB flash drive. Cameras are controlled via laptop over a Wi-Fi connection. The cameras have tilt and 360 degree rotation capabilities which allows for the recording of all areas of the classroom. To record the teacher's voice, student's voices, and other classroom noises a sound bar is mounted above the white board along with several microphones placed throughout the classroom. This allows the pre-service teacher to get the whole classroom experience when viewing their recorded lesson.

Pre-service teacher lessons are recorded alongside student reactions. The recorded lessons are then utilized in the agricultural education pre-service teaching methods course. Split-screen technology gives the pre-service teacher the opportunity to see student reactions

and immediately relate them to specific teacher actions. This action-reaction association allows pre-service teachers to develop a sense of effectiveness as an educator.

Pre-service teachers complete a series of self-reflections based upon the recorded lessons.

- Step 1. Initial reflections are based upon observations of the lesson prior to viewing the recorded lesson.
- Step 2. Pre-service teachers then view the recorded lesson and complete a reflection based upon observations from viewpoints of both the teacher and student.
- Step 3. Pre-service teachers conclude the series of reflections by coming up with improvements to enhance the lesson.

Results

Iowa State University offered an agricultural education course aimed at enhancing methods of teaching and learning as they relate to agricultural constructs. Students enrolled in the course used split-screen technology to complete evaluative reflections of recorded lessons. After completing the reflections, the students appeared more cerebral about their teaching and their surroundings. Pre-service teachers' situational awareness of the classroom has improved, thus enhancing lesson content and overall instructional effectiveness. This technology is now being implemented into the pre-service teachers Methods of Teaching Agricultural Mechanics Class to enhance laboratory-based lessons. The researchers hypothesize that the implementation of the split-screen technology will also aid in enhancing the teachers laboratory awareness.

Future Plans

A quantitative study has been designed to assess the integration of split-screen technology into the agricultural education pre-service teacher course: Methods of Teaching Agricultural Education. Researchers will measure the perceived efficacy of split-screen technology by utilizing a survey instrument with Likert type responses. The researchers recommend conducting qualitative analysis of the reflections looking at reflections that have been submitted by students prior to viewing their recorded lessons and to the reflections submitted by students after they viewed their recorded lessons. The researchers also recommend investigating the possibility of eliminating the need for a USB flash drive by uploading the lessons onto YouTube as outlined by Pate et al. (2012).

Resources Needed

The only resources required for this project were media equipment and installation. Media equipment included multimedia video projector (\$895.00), two network cameras (\$1,336.04), multiple microphones (\$485.30), and video and audio accessory equipment (\$1,028.42). When combined with equipment installation (\$1,662.38), the total project cost was \$5,407.14. All of the expenses were paid for using student computer technology fees.

References

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