Chapter XV

simClass:
Simulate Your Class Before You Teach

Bokyeong Kim
University of Virginia, USA

Donguk Cheong
Korea National University of Education, Republic of Korea

ABSTRACT

This chapter presents the theory, structure, and development process used in designing a teaching simulation. simClass was designed to help teachers practice differentiated teaching based on students’ traits such as intelligence and personality. simClass has been shown to provide an effective environment for simulating many important steps of teaching. The development process for teaching simulation consists of three phases: learning and analyzing the phenomenon of teaching, designing elements for a teaching simulation and developing and implementing field trials of the simulation. This chapter shows how simClass followed the three phases of the development process for teaching simulation. At the end of the chapter, several implications for the research of teaching simulations were presented.

INTRODUCTION

Teaching is a decision-making process and teachers, therefore, must become effective decision makers (Hunter, 1982). Danielson (1996) estimated that teachers have to make 3,000 decisions daily, so they need the ability to choose the best course of action among multiple alternatives to achieve their intended instructional objectives. Teachers and pre-service teachers can improve their decision-making skills by practicing in a real classroom context. Unfortunately, this field experience can be detrimental to students if novice teachers strictly use trial and error in the classroom. Teaching in a simulation can be a safe way of practicing teaching skills, and improve their ability to make sound instructional decisions (Ferry et al., 2004; Gibson, 2006).

simClass is a web-based interactive learning environment that teachers and pre-service teach-
ers can use to practice decision-making. It builds upon and extends two prior simulation projects: simSchool (Gibson, 2004; Gibson & Halverson, 2004; Zibit & Gibson, 2005) and Cook School District (Girod, Girod, & Denton, 2006; Girod, 2006). simClass provides users with opportunities for developing skills such as lesson planning, differentiating instruction, and adapting teaching to the traits of students. There are six Korean virtual students in simClass; teachers who play the simulation have a goal to raise student achievement. Users have to design, teach, and evaluate their class in consideration of the students’ traits such as types of intelligence, motivation level, and personality. The teachers who are the users of this simClass are presented with a screen depicting six virtual students after the designing of the simulation had been completed. Teachers are made aware of the effectiveness of their decisions by the responses of the virtual students. Some of the responses include boredom, challenge, anxiety, and positive and negative emotions in verbal and nonverbal ways. The teacher has to assign the treatment as they designed it in order to make the virtual students challengeable and positive. The challengeable and positive responses of one student translate into the student achieving a higher performance. At the end of the simulated class, simClass provides feedback to users about their teaching.

DESIGN AND DEVELOPMENT OF TEACHING SIMULATION

Because teachers are the primary audience for teaching simulations as opposed to students, the design and development perspective differs from that of other educational software. Teaching simulations provide the teaching environment including virtual students to the teachers and pre-service teachers who are the users of the simulations. On the contrary, general educational software plays a role of a virtual teacher to the students who are the users of the software. The authors extracted design principles for teaching simulations from the literature and past research on teaching simulations, which led to the teaching simulation’s design and development process.

Design Principles for Teaching Simulations

Wang and Hannafin (2005) claim that design is important for technology-based learning environments, such as simulations that prepare teachers, and that a new paradigm is emerging to verify a design’s viability. They claim that because the focus of the people who study technology-based learning environment is only on the effectiveness and the attractiveness of the developed products, but model or design of the learning environment that should be viable with regard to research objectives and theoretical background is likely to be tainted easily due to the researchers’ subjective opinion. Teaching simulations are different from others that are based on physical systems and scientific principles such as stock market simulation, traffic guidance simulation, and physical and chemical reaction processes simulation. Teaching simulations need to be designed with special variables that represent instructors, learners, educational processes and educational environments that are the primary elements of a class. Among those variables, personal elements involved in representing instructors and learners take up a very significant portion. In this respect, a teaching simulation’s design must include the theoretical basis for teaching and learning. This is because finding the basis for the generalization and simplification of diverse classes should be found in the teaching and learning theories since simulation is the abstraction or simplification (Heinich, Molenda, & Russell, 1993) of a situation or process.

We examined the literature on teaching and learning as well as simulation development to draw out the following five principles for the design of a teaching simulation. These principles