Building Integrative STEM (Science, Technology, Engineering, and Mathematics) Learning Community: A Pre-service Elementary School Teachers’ Class

Dongkuk Lee, Hyuksoo Kwon, and Jisuk Kim

Graduate Student
Korean National University of Education
South Korea
Dongkuklee99@gmail.com

Researcher
Kyungpook National University
South Korea
kwonhs74@gmail.com

Associate Professor
Gongju National University of Education
South Korea
jskim@gnue.ac.kr

Abstract: This study is designed for identifying key impacts of utilizing e-portfolio and expert group participation strategies on 34 elementary pre-service teachers in an integrative STEM (Science, Technology, Engineering, and Mathematics) class. Specifically, e-portfolio and SNS (Social Networking System) approaches were employed to accomplish the goal of this study. A valid and reliable self-reporting survey was administered to 34 elementary school pre-service teachers as the primary data source. Pre-test and post-test surveys of information and computer competencies, attitude toward teaching technology and invention, and perception toward elementary school technology education were administered. This study was conducted by three stages: Preparation, implementation, and assessment. The class consisted of two individual tasks and three group hands-on tasks. Statistical analysis techniques were primarily used to describe key academic and motivational transitions of 34 participants through a class, Technology and Invention. Additionally, qualitative analysis techniques were used to support the findings of the statistical analysis. The research findings are as follows: 1) Students’ information and computer competencies were significantly improved through this class. During the e-portfolio work, students could improve their competencies of using several simple digital hardware and software, writing the blog and/or bulletin board, and searching for relevant information from internet. 2) Students’ beliefs toward teaching technology and invention in elementary school level were positively changed through this class. They perceived that technological problem solving contained the integrative feature with other school subjects like science, mathematics, language arts, social studies, etc. Integrative efforts in their projects turned out to be very pervasive. 3) The e-portfolio and SNS approaches were found to be helpful for students providing a good reflective thinking and writing time in their projects.