Exploring the Effects of Student-Centered Project-Based Learning with Initiation on Students’ Computing Skills: A Quasi-Experimental Study of Digital Storytelling

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ABSTRACT

This study investigated, via quasi-experiments, the effects of student-centered project-based learning with initiation (SPBL with Initiation) on the development of students’ computing skills. In this study, 96 elementary school students were selected from four class sections taking a course titled “Digital Storytelling” and were assigned to the following four groups: SPBL with Initiation group (G1, n = 20), SPBL group (G2, n = 31), PBL group (G3, n = 24), and Traditional group (G4, n = 21). Students had to design digital materials for digital storytelling. The researchers collected both quantitative and qualitative data, including conducting interviews with students and using teachers' journals. Based on the analysis in this study, the effect of SPBL with Initiation on students’ computing skills was significantly higher than for those without or with other treatments. This research provides an innovative design and illustration of SPBL with Initiation for teachers, educators, and schools that are keen to enhance students’ computing skills.

Keywords: Digital, Initiation, Learning, Project-Based Learning, Storytelling, Student-Centered

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INTRODUCTION

With the rapid development of information technology, the trend in education and learning has changed from traditional in-class teaching to teaching via digital media. As students like to be immersed in convenient technologies and the Internet, their ways of learning have changed. Teachers and schools need to predict and prepare students for their future, the scope of which covers teaching students how to apply digital technologies and information, how to think, and how to communicate.

The age of the Knowledge Economy has come, and with it, a need for people to learn and retrieve knowledge continuously in order to improve their competitiveness. Therefore, knowledge education has become an important industry. In societies undergoing rapid substantial changes, schools have to train students with practical knowledge and skills for their future competence. Teachers should try to avoid using the educational format of traditional written tests and recitation as the only teaching method. Instead, they should adopt teaching models that can inspire students to think, to learn how to learn, and to apply their knowledge to create and solve problems. Project-based learning (PBL) could empower learners to pursue content knowledge by themselves and display their new understandings via diverse presentation modes (New York City Department of Education, 2009). PBL can be used to resolve the difficulties encountered in traditional teaching, replace the traditional way of imbuing students with knowledge, create an atmosphere of cooperative learning, improve students’ abilities of thinking and solving problems, and cultivate students’ interest in learning. Thus, the researchers adopted a PBL approach in this study to help students develop their computing skills.

Based on the researchers’ teaching experience, observation and reflection, the learning motivation of students at every level is decreasing. In the interest improving students’ learning, Verma, Dickerson and McKinney (2011) reveal that the learning efficiency of students with higher involvement in learning is elevated. Educational research also indicates that students’ learning takes place through actively incorporating new information, experiences, and constructing their own meanings (Sa- hin & Kulm, 2008). The advantage of student-centered instruction is to provide a positive learning environment for students wherein they can participate in challenges (Garrett, 2008). Therefore, the authors further adopted student-centered project-based learning (SPBL) to enhance students’ learning effects.

Today, students lack the ability of solving problems actively and independently. In a learning situation, if a teacher can guide students into the proper sequence, it would be helpful for students’ learning (Tsai, 2010). Mathematics educators seem to have a consensus and indicate that when students conduct collaborative investigations under a teacher’s guidance, mathe-
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