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Project-based learning in virtual groups - collaboration and learning outcomes in a virtual training course for teachers

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Abstract

The pressure on the ability of training to teach useful and applied knowledge is growing, as society becomes more competitive and more information consumer. The aim of this research is to show whether the application of a project-based task in virtual groups has led to a greater significant knowledge to participants. Forty teachers who were studying a master program at a fully online institution participated in the study. Teachers worked in groups of 4 or 5 members through forums where they exchanged messages and files during four weeks. They had to carry out a project on how to integrate technology in schools and classes. Three types of knowledge were analyzed: academic, professional and applied. The results of our analysis show significant improvement in all three types of knowledge. Teachers were able to use more ideas, propose more actions and place them in a given context. Our results support project-based learning in virtual environments to foster meaningful learning.

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1. Introduction

In today's life we appreciate a real need of problem solving knowledge, linked to the fact that we are great consumers and processors of information. This type of knowledge requires very different approaches from those that are enhanced by traditional instructional methods with teacher-centred approaches and abstract content.

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A recent report of the European Student Union in collaboration with the European Commission (2014) stresses the need to promote a “shift from more organizational input-oriented curricular design, based on the description of course content, to outcome-based higher education”. Learning methodologies based on problem solving require students to think critically; to analyze the information needed to solve the problems of the society around them (Grabinger, Dunlap & Duffield, 1995).

Project based learning refers to any programmatic or instructional approach that utilizes multifaceted projects as a central organizing strategy for educating students (Ngoh, 2015). Several investigators propose that project-based tasks encourage significant learning and problem-solving skills through self-directed student research (Blumenfeld et al., 1991). Activities involved in a project-based task are typically learner-centred, real-based, and monitored by a teacher who acts as a facilitator, not as an instructor.

The objective of this research is to show that the development of a project-based task in a virtual small group promotes significant learning in higher education students, by means of analyzing prior and final knowledge of students after a collaborative task.

2. Theoretical background

2.1. Project-based learning and project-based tasks

Project-based learning is a response to the lack of contextualization and over-simplification and excessive abstraction of learning in schools. As Resnick (1987) notes "the traditional school often fails to prepare students for the type of learning, behaviour and attitude that is needed outside the school environment." Research that analyzes the learning process outside the educational context, show that the authenticity of a learning activity and its context are integral to knowledge and learning outcomes. Is in that sense where learning is understood as a situational concept (Brown, Collins & Duguid, 1989) and not timeless or out of context. According to LaFey et al. (1998), project-based learning is a modification of what was initially conceived as “contextual statement” a methodology that emphasized knowledge construction and problem solving by students in a given situation and that often happened during a long period of time. Thomas and MacGregor (2005) consider that collaborative development of projects in Higher Education presents an ideal opportunity to provide problem-solving situations present in the real world.

Under the umbrella of a project-based learning a wide type of tasks conducted in all types of training and in different educational levels are brought together: field studies, applied research, mechanics, laboratory practices. These wide range of projects share a set of characteristics: (1) authenticity: learning involves a real problem and an effective solution has to be found; (2) complexity: the problems are complex tasks, and solution requires a significant investment of time; (3) centrality: the activity is significant and central to the curriculum of students, it is not complementary or a peripheral activity; (4) construction research: a goal-directed process, which involves asking students to discuss and build their knowledge and solve problems. The central activity of the project should involve knowledge processing and knowledge construction (Bereiter & Scardamalia, 2003). If project activities are not difficult for students or can be made by applying skills or information already known, the project is an exercise, not a project-based task; (5) use of tools: students use different tools and techniques to investigate, manage, plan, implement and report the project; (7) autonomy: the projects are not led by teachers or packaged in instructions, they incorporate a high degree of autonomy, choice, personal unsupervised work and greater responsibility.

Different researchers have shown better learning outcomes in students who participated in project-based tasks (Taradi, Taradi, Radić & Pokrajac, 2009; Biasutti, y EL-Deghaidy, 2012). However, others (Şendağ & Odabaş, 2009) did not find significant differences between students that participated in traditional or project-based tasks.

2.2. Significant learning in teacher training

In literature on learning and instruction, knowledge has been considered from a wide variety of theoretical frameworks (De Jong & Ferguson-Hessler, 1996). From the perspective of teacher training, significant knowledge often is classified in three well-known types of specific domain knowledge, called academic, professional and applied (Freeman, 1996).

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