

Chapter 7

Project–Based Learning as an Instrument for the Formation and Development of Research Skills of Biology Students

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ABSTRACT

In response to the demands upon the academic community to improve the quality of university teaching, the authors have been developing project-based methodology in terms of biological science. This Chapter mainly focuses on deriving principles and practice in conducting project courses covering a range of major disciplines. Increased emphasis is placed on a distinguishing feature of the study which implies consistent scientific sophistication of project methodology beginning in the first year of tuition and continuing later in degrees. The general project design proposed interrelates with meeting students' future research activity.

DOI: 10.4018/978-1-5225-3485-3.ch007

INTRODUCTION

In the 21st century the reformation of education has intensified both organizationally and thematically. The transformation proposed by European Higher Education Area (EHEA) in Bologna Declaration involves the transition from an education system based on teaching to a system based on learning, making the student the center of the educational process.

The educational reforms in Russia are supported by a number of federal laws and doctrines accepted by the Russian community. They are National Doctrine of the Russian Federation Education up to 2025; Conception of National Educational Policy in the Russian Federation; Russian Federal State Educational Standards of Higher Education and others.

The main goal of modern university education is training a scientist and a researcher. The development of research skills is successfully achievable through project-based learning which embraces a great variety of efficient learning techniques relied on a solid theoretical base. The techniques involved facilitate the solution of a number of diverse scientific problems as well as of numerous issues of applied value. Project-based learning provides the development of social, communicative and organizational skills which are part of the researcher's competence.

BACKGROUND

Project-based learning is a pedagogical technology implying the application of actualized knowledge. Being oriented at self-learning and self-management, it involves learners in the course of educational activity ranging from the formation of an idea and up to its implementation.

A project is a way of phased organization and description of an activity aimed at studying and implementing changes in a natural or social environment within a limited time and with limited means. The application of the project-based method at the contemporary stage of the professional training system development is more and more actively revealing and exposing its potential. In particular, unlike classical methods, project-based learning strengthens students' motivation and satisfaction and develops skills, which raise a degree of their demand in business (Filho, Shiel, & Paco, 2015). The project-based method implements a whole range of principles that are topical today. Among them the following might be highlighted:

- Students' self-sufficiency
- Students' collaboration with each other, teachers and employers
- Consideration of students' individual qualities
- Actualizing learners' subjective position
- Interconnection between the teaching process and the actual social and natural environment (especially in biological and ecological education)

Project-based learning has an impact on such skills as self-management, teamwork, leadership, time management, communication and problem-solving. Students learn to work together on searching for the solution of a problem (Kubiatko & Vaculová, 2011; Zhylykybay, Magzhan, Suinzhanova, Balaubekov, & Adiyeva, 2014).

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