

## The Project Activity in High School Specialists' Preparation

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### ABSTRACT

The relevance of the research problem is caused by the modern discourse of students' involvement to the project activity. Moreover, the current labor market requires a high level of graduates' professional competitiveness. Therefore, this article is aimed at the development of optimal scheme of high school specialists' preparation on the basis of project-based learning. The poll conducted among the 2 500 high school students showed 35,9% of respondents are not involved in the project activity. 13,38% of students claim the level of applying of project activity in their university is unsatisfactory. In this case the scheme of project-based learning mechanism implementing was introduced. The practical value is that the submissions may be useful in current university practice regarding students' project activity encouraging.

### KEYWORDS

Educational environment, Project-based learning,  
High school students' competences, Project and  
critical thinking, Professional activities.

### ARTICLE HISTORY

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## Introduction

Project-based learning (PBL) is the factor influences the increasing of educational process efficiency (Kalatskaya & Drozdikova-Zaripova, 2016). Now it is considered as one of the standard teaching methods (Krajcik & Blumenfeld, 2006) and as a means by which students can develop independence, responsibility and also practice social model of behavior (Stefanou et al., 2013). Moreover, it improves their competitive, mobility, and level of motivation (Bartscher, Gould & Nutter, 1995). Thus, the development of project activity is of particular importance in terms of student-centered teaching (Markham, Larmer & Ravitz, 2003) and contestable labor market (Bell, 2010).

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Can note educational goals in high school should be focused not only on descriptive-analytical knowledge gaining but also on creation of interdisciplinary learning environments and teamwork skills advancement (Flores et al., 2006). Such conditions increase future specialists' possibility of self-actualization in the course of professional activities (Weidman, Twale & Stein, 2001). It stipulates the implementation of PBL principles in one way or another

### Literature Review

The scholars argue the following tasks must be solved by high school: students' involvement into universal values and adequate to these values behavior forming; the youth creativity promoting (Ganieva et al., 2014), self-consciousness development, assistance in students' self- and professional realization etc. (Wang et al., 2009).

In this regard the proponents of project-based learning claim project activity places students in realistic, contextualized problem-solving environments and it promotes the development of all the abilities mentioned above (Stefanou et al., 2013).

It is pertinent to point out that PBL is mostly viewed as a systematic teaching method that involves students in knowledge and skills mastering through an extended inquiry process structured around complex, problematic questions and carefully designed products and tasks (Markham, Larmer & Ravitz, 2003; Bell, 2010). In general, it was firstly described by W. Kilpatrick in his publication (Kilpatrick, 1918). The scholar devised four classes of projects: construction (for example, writing an essay), enjoyment (such as experiencing a concert), problem (for example, discussing a gender inequality), and specific learning (learning of skills such as playing piano).

In the 20th century project-based learning was considered to be one of the most appropriate methods of education system revamping, especially in Northern and Central Europe. In USA this approach has been used by educational reformers in the context of vocational and industrial education (Cruikshank & Beineke, 1998). At the same time some German scientists believed project activity was a "methodical device" (Stubenrauch, 1971) and "contrafactic idea" (Suin de Boutemard, 1976) with which the existing capitalist system could be overcome.

Presently PBL has already been shown to be effective for teamwork skills and critical thinking development (Zamyatina et al., 2013). Furthermore, the informatization of modern society predetermines the necessity of wide use of information technologies in this sphere. It is manifested in the development of computer - assisted project - based learning environments (Lin & Tsai, 2016; Hsu et al., 2016).

Can add project-based learning is examined from the psychological point of view. L. Vygotsky (1991) observed human mental functions occurred only in the process of people interaction. Thus, students thinking skills development is due to joint educational and creative activities, which can be fully implemented during the practical project activity. Moreover, technology of PBL in high school,

as the principles of student-centered teaching, brings personal and professional skills of future specialists to the top. Simultaneously teachers abandon comprehensive control over the students' activities. This approach facilitates the humanization of the educational process. J. Thomas & J. Mergendoller (2000) also emphasis on changing the traditional roles of teachers and students during the project activities.

We agree with the statement that PBL is more authentic than traditional (Bell, 2010). It is a picture of the real environment the students will be facing in the workplace. In our opinion, this condition is one of the defining in future specialists' preparation. However, the practice of usage of PBL in high school remains poor.

### **Aim of the Study**

The purpose of the article is to examine the essential features of PBL and also describe the optimal environment for high school specialists' preparation on the basis of project activity.

### **Research Questions**

The research questions were as follows:

- What are the objectives of PBL in high school?
- What are the conditions of learning environment under which the project activity in high school will be activated?

### **Method**

Research methodology is based both on the theoretical and experimental methods. The first group includes theoretical analysis of scientific literature on high school students' project activity improvement.

The experimental work consisted in the conducting a survey among the students in order to find out the level of PBL implementation. The poll was carried out in 2016 on the basis of Nazarbayev University, L. N. Gumilyov Eurasian National University, Kazakh University of Economics, Finance and International Trade, and Kazakh University of Technology and Business (Astana, Kazakhstan).

The sample has constituted 2 500 students aged 18-22.2 452 valid responses were received and summarized. Each questionnaire included 3 multiple choice questions and 1 open-ended (Table 1).

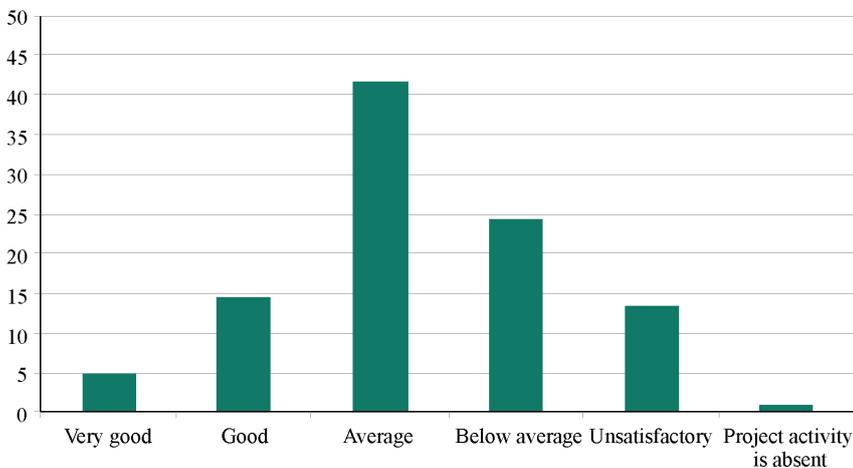
In connection with the obtained results and in order to stimulate the development of students' project skills, we propose the scheme to high school students. In pursuit of this goal of the study the methods of pedagogical modeling and forecasting based on monitoring of the main problems in specialist' preparation were used.

**Table 1. The structure of the questionnaire**

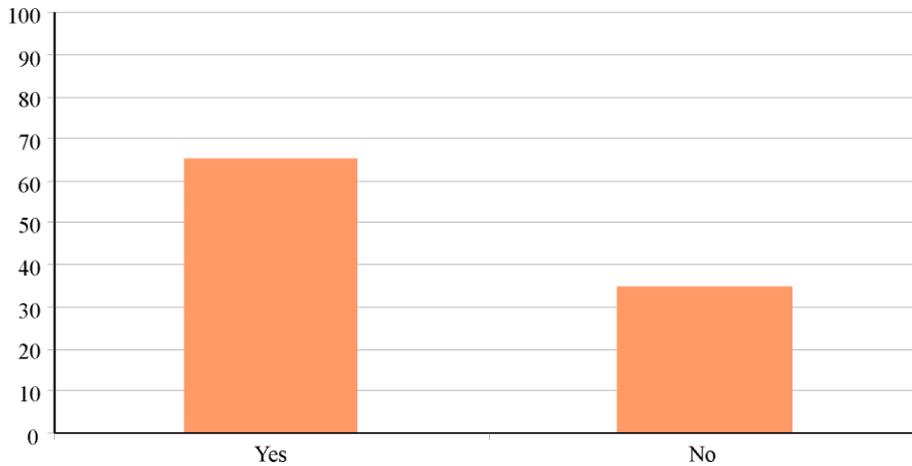
№	Question	Possible answers
1.	What is the level of applying of project activity in your university?	a) very good; b) good; c) average d) below average; e) unsatisfactory; f) project activity is absent
2.	Do you participate in any project activities?	a) yes b) no
3.	What kind of project activity you are practicing at the university?	a) technical design b) research projects c) information projects d) art projects e) other (specify)
4.	What are the main problems of high school specialists' preparation on the basis of project activity?	

### Data, Analysis, and Results

Data of the survey among students confirm our hypothesis that the practice of usage of PBL in high school remains insufficient. Thus, the majority of respondents (41,64%) think the level of applying of project activity in their university is average. 24,35% found it in below average level. Only 122 students have indicated on very high quality of PBL (Figure 1).

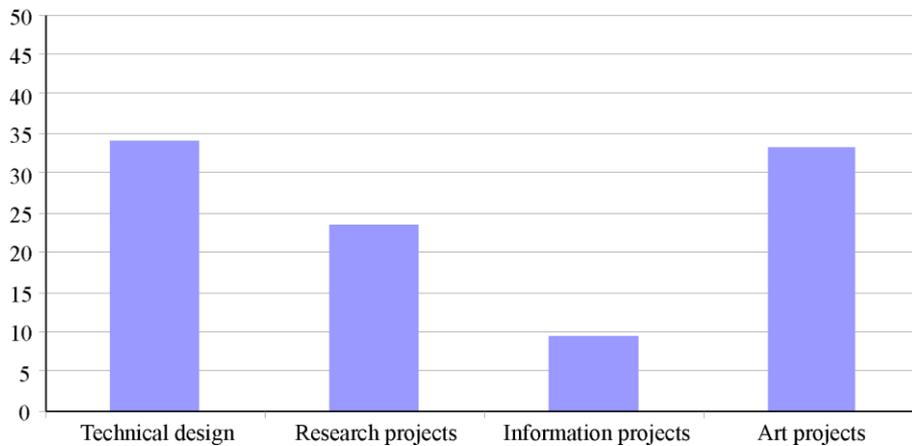
**Figure 1.** Level of PBL application

The poll showed that 35,9% of surveyed are not involved in the project activity (Figure 2). We suppose it can adversely affect the development of teamwork skills and professional competence of future specialists.



**Figure 2.** Participation in project activities

Defining the main directions of project activities, it was founded that the majority of students practice technical design (837 respondents) or art projects creating (813 answers). We associate it with the specific of the specialties chosen by students. 23,38% of respondents are engaged in research activity, which can be generally considered as a poor indicator (Figure 3).



**Figure 3.** Directions of students' project activities

The answers on 4<sup>th</sup> question from the questionnaire concerning the main problems in PBL organization mainly were as follows:

1. I'm not familiar with the available opportunities of project activity in my university ( $\approx 45,8\%$ ).
2. Teachers do not encourage project activities ( $\approx 25,6\%$ ).
3. It is a lack of appropriate material and technical resources for project activity ( $\approx 14\%$ ).
4. There is no time for it ( $\approx 61,4\%$ )\*

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\* The sum exceeded 100% because students wrote more than one answer.

The obtained results determine the necessity of the creating optimal scheme of high school specialists' preparation on the basis of project activity.

Thus, we have defined the main steps of PBL mechanism implementing:

- organization of incentive information space at the university;
- finding project ideas related to the issues that will motivate students interest;
- identifying basis knowledge and skills students ought to have for this project;
- determining logistics for new project;
- defining deadlines and planned activities;
- inclusion of the principles of self-directed learning, advanced team working, and solution-oriented research with real-world impacts.

Can add the project activity directions in high school should be aimed at the developing of professional competences complying with specifics of academic education.

### Discussion and Conclusion

Some scholars equate Kilpatrick's project method mentioned above to Dewey's problem-solving methodology (Dewey, 1998). In this regard we agree with A. Sutinen (2013), who emphasizes Kilpatrick's project method and Dewey's idea of pupils' reflective activity contain a similarity that is related to the motive of the pupil's project thinking.

At the same time, these learning concepts differ from each other in that the first project method ends up in circular reasoning in its explanation of learning, while the second ends up in the metaphysics of the students' internal creativity. This issue became the subject of debate in Britain, Germany, Canada, Argentina, and Australia by the end of the 20th century (Cruikshank & Beineke, 1998).

Can note our research findings are linked to the conception of E. Semenova (2006) about project activity as the factor encouraging students' professional consciousness formation.

R. Chetty, J. Friedman & J. Rockoff (2011) have proved the importance of project activity in high school by the survey among 2,5 million students in the US. The scholars claim students' participation in project activity makes them more competitive while applying for a job, and acquired research skills of students favorably distinguish them among others and contributes to obtain more high salary. This thesis is also reflected in the research of O. Zamyatina et al. (2013) in the context of engineering education.

From a comparative study of PBL courses at universities in Europe, North America, and Australia, K. Brundiers & A. Wiek (2013) determine challenges for PBL in high school. Can note they intersect with answers of students interviewed during our experimental work.

Another approach was used by J. Thomas & J. Mergendoller (2000). They conducted a survey of PBL teachers designed to elicit or construct principles

associated with successful implementation of project work. The responses were grouped into 10 themes. The last ones were constructed to represent the larger issues that seemed to recur across teachers' answers to the poll questions. Principles were summaries of teachers' strategic responses to the issues raised in the themes. An example of a theme was "creating a positive learning environment." Principles associated with this theme were:

- establish a culture that stresses student self-management and self-direction;
- use models or exemplars of excellent project work;
- create a physical environment that will facilitate project work.

To sum up, the experimental work showed that level of usage of PBL in high school remained poor.

35,9% of high students are not involved in the project activity. 0,99% said PBL was generally absent. In contrast, 837 respondents practice technical design and 813 create art projects in the university.

The poll confirmed the relevance of project-based learning mechanism implementing. So, the proposed recommendations may be useful in current university practice for students' project activity encouraging.

### Implications and Recommendations

The research findings can serve as a basis for teaching practices aimed at improving the level of project activity in high school specialists' preparation. Further studies can be focused on the creating measures for project activity improvement for students of certain specialties: engineering, humanities etc.

### Disclosure statement

No potential conflict of interest was reported by the authors.

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