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## **Impact of Utilizing the Project Method in the School Educational Environment on the Development of Soft Skills in High School Students**

Arslanbek Mukhametkairov <sup>a, \*</sup>, Berik Matayev <sup>a</sup>, Assyl Matayeva <sup>a</sup>, Nataliia Fominykh <sup>b</sup>

<sup>a</sup> Pavlodar Pedagogical University named after A. Margulan, Pavlodar, Republic of Kazakhstan

<sup>b</sup> Plekhanov Russian University of Economics, Moscow, Russian Federation

### **Abstract**

The study aims to analyze the efficiency of developing soft skills with the use of project technologies. The relevance of the study owes to the need for developing soft skills in the younger generation. This need relates to the increased demand for communication and teamwork skills in specialists. The emphasis on these skills is especially topical in school education, where their development via project activities facilitates meaningful interpersonal interaction between project participants. The established goal is achieved in the study through a set of theoretical and empirical research methods, including the analysis of literature on soft skills development, including in the context of the school educational environment, and a pedagogical experiment to test the efficiency of project technologies in developing the soft skills of high school students. The obtained findings indicate a positive dynamic in the soft skills of high school students taught using project activities. For this reason, the study stresses the need to substitute the passive traditional pedagogics limited to the transmission of knowledge with active pedagogics.

**Keywords:** soft skills, high school students, project method, project activities, critical thinking, teamwork, communication skills.

### **1. Introduction**

At the initiative of the World Health Organization (WHO) in the early 1990s, the concept of life/social skills entered into wide circulation (Gabidullina et al., 2020). The concept refers to a set of social skills necessary for interaction with other people, and the ability to cope with both ordinary tasks and complex situations (Dobriakova et al., 2018).

As society continues to evolve, the acquisition of life/social skills is becoming an important part of personal development. The ability to navigate the complexities of interpersonal

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\* Corresponding author

E-mail addresses: [arslanbek.mukhametkairov@list.ru](mailto:arslanbek.mukhametkairov@list.ru) (A. Mukhametkairov)

relationships, effectively manage emotions, and make informed decisions is evidence of individual adaptability and sustainable personal development (Sarin et al, 2024).

However, the concept of soft skills is different from life/social skills. Specifically, the former is the broader concept, with life/social skills being a part of soft skills (Canney, Byrne, 2006).

The concept of soft skills (Batsunov et al., 2018) is increasingly often covered in normative educational documents and scientific studies (Ybyrainzhanov et al., 2019a). Researchers understand soft skills as a set of non-specialized, supra-professional skills that ensure the person's successful participation in the work process, their high productivity (Golubeva et al. 2023; Ybyrainzhanov et al., 2019b). Unlike specialized skills, soft skills are comprehensive and do not relate to any particular subject area (Bishop, 2017). These skills encompass a combination of interpersonal and social skills, communication skills, and personality traits (honesty, efficient communication, politeness, responsibility, professionalism, flexibility), as well as the ability to teamwork, attitudes, career attributes, and emotional intelligence quotient (Robles, 2022; Ybyrainzhanov et al., 2022). The term "soft skills" is also contrasted with "hard skills", which are seen as more professional, technical, and specialized, in particular, as those related to the specific profession. Furthermore, hard skills are (usually) easier to master than soft skills (Sopa et al., 2020).

Soft skills are characterized by the person's readiness and ability to act in changing conditions relying on their experience and intuition, as well as the ability to change and transcend rigid functionality (Iorio, 2022; Amirbekova et al., 2023).

To the category of soft skills, researchers attribute educational, social, and personal skills, as well as the skills of information, media, and digital literacy (Hernandez Garcia de Velazco, 2022). The latter, according to the UNESCO strategy, cover the totality of knowledge, skills, and relationships necessary for life and work in using, creating, and transmitting information (Škuškovnika, 2022).

Speaking of the skills necessary for the future, researchers note that this set of competencies varies from country to country, yet always relates to the skills demanded in the present, namely critical thinking, communication and teamwork skills, a creative approach, and the skills of operating in the digital environment (Evans Allvin, 2016; Sergeeva et al., 2021). These skills are referred to as the 4Cs.

The program of the educational alliance Partnership for 21st Century Learning explores the 4C formula: creativity as a way to reject stereotypical thinking (according to J.P. Guilford); critical thinking as the ability to think clearly and rationally, understanding the logical links between thoughts and ideas; collaboration, or teamwork skills; and communication skills as a group of skills characterizing the personal traits necessary for the organization and execution of communication and interaction (Mukataeva et al., 2022). Researchers argue (Succi, 2015; Zhilin, 2016) that these are the skills that will be essential in the future.

Thus, the development of critical thinking, interaction and communication skills, leadership qualities, and creativity, e.g., soft skills, is an urgent issue of today (Ybyrainzhanov et al., 2022). The level of soft skills development is a telling characteristic of the school student's "Self" that favorably distinguishes them from other subjects in the educational process (Wats, Wats, 2009; Karimova et al., 2022).

One possible means of building the soft skills of students in general education schools is project activities (Yessenova et al., 2023). Projects serve as an activating learning process (Avdeenko et al., 2018; Berkovich et al., 2018; Pakhar et al., 2021) that develops a wide range of skills in the subjects of the educational process. Application of the project method in class and extracurricular activities immerses students into the subject area, expands the scope of their practical skills, and strengthens their ability to conscious logical actions. At present, the potential of project activities is utilized by teachers to shape and develop both the subject-specific and general competencies of students.

## **2. Literature review**

Soft skills are interpreted across different studies as a set of non-specialized supra-professional skills responsible for successful participation in the work process, high productivity, and, as opposed to specialized skills, are not bound to one specific sphere (Rao, 2012). Soft skills are also defined as a complex of non-technical knowledge and skills that make up the foundation of successful participation in work processes (Vasanthakumari, 2019); the skills that are not related to the workplace and are closely tied to personal qualities (confidence, discipline, self-management, etc.), social skills (communication, teamwork, emotional intelligence, etc.), and leadership skills

(rational time management, resolution of complicated modern problems, critical thinking, etc.) (Ivonina et al., 2017).

Scholars believe soft skills to possess systemic characteristics. One of these is emergence, which provides the combined operation of interrelated elements and the appearance of new functional properties instead of a simple sum of functions. Another systemic characteristic is synergy, which increases the efficiency of activity due to the combination of elements (Ngang et al., 2015). Considering social interaction, soft skills are understood as a set of non-specialized supra-professional soft competencies that contribute to the successful performance of the job duties of specialists in any field (Raitskaia, Tikhonova, 2018).

The prominent role of soft skills is stressed in the vast majority of scientific, methodological, and publicistic sources. Research conducted at Harvard and Stanford Universities proves that soft skills account for 85 % of career success (Tsalikova, Pakhotina, 2019). The same is argued by R. Ibrahim et al. (2017) with an emphasis on the acquisition of key competencies and transversal abilities.

Specialists concur that soft skills represent the personality traits, goals, motivations, and preferences valued in the labor and educational markets. These skills serve as predictors of life success. Soft skills are interpreted as immaterial, non-technical, personal skills that define the person as a leader, facilitator, intermediary, and negotiator (Iorio, 2022). Some researchers equate soft skills with emotional intelligence (Evans Allvin, 2016), while others view them as a dynamic combination of cognitive and meta-cognitive, interpersonal, intellectual, and practical skills (Škuškovnika, 2022).

Different sources offer varying versions of the term “soft skills”, such as “flexible skills” and “success skills”, and psychology attributes them to the group of social skills. The conducted review of scientific sources (Batsunov et al., 2018; Robles, 2022; Škuškovnika, 2022; Sopa et al., 2020) and summarization of sociological studies suggest the following classification of soft skills:

- learning skills (critical thinking, ability to learn quickly, adaptability to changing world realities, creativity, lifelong learning skills, commitment to academic/professional achievement and self-development);
- social skills (positive thinking, emotional intelligence, ability to teamwork, leadership, conflict-free communication skills, public speaking skills);
- personal skills (a person's ability to flexibly manage other people's emotional reactions, to activate and realize personal potential, initiative);
- information, media, and digital literacy skills (ability to find information, determine the credibility of sources using various evaluation tools, publicize the selected facts, create technologies necessary for the exercise of an active civil position).

Existing literature substantiates the pivotal role of soft skills in facilitating academic achievement and professional advancement, however there is a gap in empirical research specifically focused on the development of these skills within the high school educational context in Kazakhstan. The literature review underscores the systemic characteristics of soft skills, which facilitate effective performance across various domains, underscoring their value beyond mere technical competencies. Furthermore, despite the consensus on the importance of soft skills, the review also indicates a lack of comprehensive strategies within the educational system to foster these skills systematically. This gap presents an urgent need for innovative pedagogical approaches, such as project-based learning, that can integrate soft skills development into the curriculum effectively. The empirical component of our study aims to address this gap by examining the impact of utilizing project methods in school education on enhancing high school students' soft skills, thereby contributing to the body of knowledge on effective soft skills development strategies in educational settings.

In this light, the purpose of our study is to analyze the efficiency of developing soft skills using project technologies.

The research objectives set to achieve the goal of the study are:

- 1) to conduct diagnostics of the development of soft skills among high school students;
- 2) to experimentally test the efficiency of project technologies in soft skills development for high school students.

### **3. Methods**

The study was conducted during the 2022–2023 calendar academic year.

The research employed a set of theoretical and empirical research methods, including:

- analysis of literature on the problem of soft skills development, including in the school educational environment;
- a pedagogical experiment to test the efficiency of project technologies in developing the soft skills of high school students.

Before the pedagogical experiment, we performed an analysis of literary sources, which were selected from Web of Science and Scopus using the keywords “soft/flexible skills”, “soft skills”, “high school students”, and “senior school students” with a restriction on the publication date not older than 10 years.

The primary research method was a pedagogical experiment conducted on 146 11th-grade school students in the city of Pavlodar (Kazakhstan). The choice of 11th-grade students as the object of the experiment is explained by the fact that the final school year is when students choose their future path, be it entering the workforce or pursuing higher education. For this reason, it is at this exact stage that it is important to assess the future specialist's capabilities and readiness in terms of developing basic interpersonal skills, such as teamwork, which are highly valued by both employers and educational institutions.

The experimental group (EG), in which soft skills were developed in the classroom using the project method, included 49 students (from one of the participating schools).

The control group (CG), in which training was carried out following the regular educational program without additional methods for the development of soft skills, was made up of 97 high school students (from two other schools involved in the study).

The first stage of the pedagogical experiment was the pre-experimental assessment of high school students' soft skills based on the 4C model: creativity, critical thinking, collaboration (teamwork), and communication skills.

Each structural element in the 4C model has its indicators, criteria, and development levels. Therefore, the assessment of these skills included several methods to determine the level of soft skills development by various components (Table 1).

**Table 1.** Diagnostic toolkit of the study

Soft skill	Method
Creativity	The Test of Divergent Thinking by F. Williams, adapted by E.E. Tunik – for testing non-verbal creative thinking; The Remote Associates Test (S. Mednick) – for testing verbal creative thinking
Critical thinking	Test questionnaire of intellectual skills. Version for high school students (9-10 grades) (Iu.F. Gushchin); The Complex Analogies method (E.A. Korobkov); The Exclusion of Concepts method (A.A. Karelin)
Communication skills	Test questionnaire of communicative skills: for adolescents and high school students (L. Mikhelson, ed. Iu.Z. Gilbukh) Method of assessing the communication and organizational skills of high school students (V.V. Siniavskii, V.A. Fedoroshin)
Teamwork	The Ability to Teamwork test

Using the diagnostic results, we identified three levels of development of each soft skill: high, average, and high.

In the second stage of the pedagogical experiment, the project method was integrated into the educational programs of students in the EG. Students in the CG were taught by the traditional educational program, without any additional methods for the development of soft skills.

The third stage involved the post-experimental assessment of the level of soft skills using the same diagnostic methods (Table 1). Statistical processing of empirical data was performed using Statistica 7.0 software.

To detect reliable changes in the level of soft skills after experimental training with the project method, we applied the angular transformation,  $\varphi^*$  criterion, which tests the reliability of differences between the percentage shares of two samples. The null and alternative hypotheses for both groups are formulated as follows.



Ho: The share of high school students with a high level of soft skills according to post-experimental testing does not exceed the share of high school students at this level before the experiment.

H1: The share of high school students with a high level of soft skills according to post-experimental testing is higher than the share of high school students at this level before the experiment.

In the fourth stage, students in the EG (49 people) were surveyed to determine the list of soft skills that, as they believed, had enabled them to communicate most efficiently with others in everyday life and educational activities.

## 4. Results

### 4.1. Pedagogical experiment

The results of the pre- and post-experimental assessment of soft skills are presented in [Table 2](#).

**Table 2.** Results on the level of soft skills development

Soft skill	Level	pre-experimental assessment, N/(%)		post-experimental assessment, N/(%)	
		EG	CG	EG	CG
Creativity	low	22 (44.9 %)	43 (44.3 %)	9 (18.4 %)	39 (40.2 %)
	average	17 (34.7 %)	35 (36.1 %)	22 (44.9 %)	38 (39.2 %)
	high	10 (20.4 %)	19 (19.6 %)	18 (36.7 %)	20 (20.6 %)
Critical thinking	low	20 (40.8 %)	39 (40.2 %)	15 (30.6 %)	37 (38.1 %)
	average	18 (36.7 %)	37 (38.1 %)	19 (38.8 %)	38 (39.2 %)
	high	11 (22.4 %)	21 (21.7 %)	14 (28.6 %)	22 (22.7 %)
Communication skills	low	21 (42.9 %)	37 (38.1 %)	11 (22.4 %)	35 (36.1 %)
	average	17 (34.7 %)	38 (39.2 %)	17 (34.7 %)	39 (40.2 %)
	high	11 (22.4 %)	22 (22.7 %)	21 (42.9 %)	25 (25.7 %)
Teamwork	low	24 (49.0 %)	36 (37.1 %)	10 (20.4 %)	35 (36.1 %)
	average	14 (28.6 %)	39 (40.2 %)	16 (32.7 %)	40 (41.2 %)
	high	11 (22.4 %)	22 (22.7 %)	23 (46.9 %)	24 (24.7 %)

Comparative analysis of pre- and post-experimental testing results shows an improvement of all the assessed soft skills in the EG.

Next, we construct empirical frequency tables for two values, “presence of effect” and “absence of effect”, and calculate  $\phi^*$ emp ([Tables 3](#) and [4](#)). In this case, we define the presence of effect as the achievement of a high level of soft skill by high school students.

**Table 3.** Table for calculating the  $\phi^*$  criterion to compare the results of pre- and post-experimental testing in the EG

Soft skill	Stage	presence of effect		absence of effect		$\phi^*$ emp
		N	%	N	%	
Creativity	pre-exp.	10	20.4 %	39	79.6 %	2.67
	post-exp.	18	36.7 %	31	63.3 %	
Critical thinking	pre-exp.	11	22.4 %	38	77.6 %	1.68
	post-exp.	14	28.6 %	35	71.4 %	
Communication skills	pre-exp.	11	22.4 %	38	77.6 %	4.45
	post-exp.	21	42.9 %	28	57.1 %	
Teamwork	pre-exp.	11	22.4 %	38	77.6 %	4.79
	post-exp.	23	46.9 %	26	53.1 %	

Critical values of  $\phi^*$ : 1.64 ( $p < 0.05$ ); 2.31 ( $p < 0.01$ )

The values of  $\phi^*$  for the EG fall into the zone of significance ( $p < 0.01$ ) for every structural element in the 4C model. This result refutes Ho and confirms H1 for the EG. Thus, the use of the project method as a means of developing soft skills proves effective.

Statistical analysis shows that especially good results from the use of the project method are achieved in the development of teamwork and communication skills. Much weaker is the effect of the project method on the development of critical thinking. This shortcoming needs to be accounted for and compensated at further introduction of the means and methods of developing soft skills.

**Table 4.** Table for calculating the  $\phi^*$  criterion to compare the results of pre- and post-experimental testing in the CG

Soft skill	Stage	presence of effect		absence of effect		$\phi^*$ emp
		N	%	N	%	
Creativity	pre-exp.	19	19.6 %	78	80.4 %	0.34
	post-exp.	20	20.6 %	77	79.4 %	
Critical thinking	pre-exp.	21	21.7 %	76	70.3 %	0.36
	post-exp.	22	22.7 %	75	69.3 %	
Communication skills	pre-exp.	22	22.7 %	75	69.3 %	0.68
	post-exp.	25	25.7 %	72	74.3 %	
Teamwork	pre-exp.	22	22.7 %	75	69.3 %	0.56
	post-exp.	24	24.7 %	73	75.3 %	

Critical values of  $\phi^*$ : 1.64 ( $p < 0.05$ ); 2.31 ( $p < 0.01$ )

In the CG, the empirical value of  $\phi^*$  is not significant ( $p > 0.05$ ) for any of the structural elements of the 4C model. This fact disproves H1 and confirms H0 for the CG. Thus, the traditional educational program without additional methods of soft skills development does not increase the level of these skills.

#### 4.2. Survey

The first question, “Identify the three most prioritized soft skills that you apply in life”, gives the following results: 43 respondents (87.8 %) gave priority to communication, 31 students (63.3 %) emphasized critical thinking, 25 students (51 %) pointed to communication/teamwork skills, and 21 people (43 %) highlighted creative thinking. The survey thus shows that most participants see communication and critical thinking as the most important soft skills.

The second question, “Name the three soft skills most demanded in educational activities”, delivers the following data: 44 students (89.8 %) emphasized critical thinking, and 40 students (81.6 %) pointed out communication/collaboration skills.

The third questions sheds light on the most valuable soft skills in extracurricular activities. Among these the respondents note the following: 46 people (93.9 %) indicated communication, 41 people (83.4 %) referred to collaboration/teamwork skills, and 30 people (61.2 %) mentioned creative thinking.

The fourth question concerns the use of soft skills in interaction as part of project activities. The results show the following hierarchy: 49 students (100 %) stressed the skills of cooperation/teamwork, 41 people (83.4 %) pointed out communication, 31 people (63.3 %) noted critical thinking, and 29 people (59.2 %) highlighted creative thinking.

#### 5. Discussion

In the present study, we hypothesized that the integration of project-based learning (PBL) within high school curricula in Kazakhstan would significantly enhance the development of students' soft skills, including communication, teamwork, problem-solving, and critical thinking. Our empirical investigation, grounded in a quantitative analysis of pre- and post-intervention assessments, provides substantial evidence supporting this hypothesis. Students exposed to PBL methodologies demonstrated marked improvements in their ability to collaborate effectively, articulate ideas clearly, and approach complex problems with innovative solutions, compared to their counterparts following a traditional educational model.

Given that most of the surveyed students accentuate the importance of communication skills, we can deduce that they all realize the importance of communication in everyday life. Critical thinking, in turn, is distinguished by them as a skill needed both in daily life and in class.

Students' choice of the most valuable soft skills in extracurricular activities can be attributed to their perception of communication and teamwork skills as important for receiving timely help when searching for, processing, analyzing, and synthesizing the necessary information virtually in any sphere of life. The emphasis placed by students on these skills reinforces the hypothesis of our study, suggesting that project-based learning (PBL), with its inherent focus on collaborative problem-solving and communication, is aptly suited to address these educational needs.

In the context of soft skills being utilized in interaction as part of project activities, the high schoolers refer to collaboration and communication as the most important, as teamwork essentially cannot proceed without communication. Of equal importance, in students' view, is creative and critical thinking, given that the development of these skills to some degree influences the process of completing a project.

Agreeing with M.I. Berkovich et al. (2018), we believe that the development of soft skills can be efficient subject to the following requirements: alignment with age and individual characteristics; development of soft skills on the basis of partnership pedagogy; and stage-by-stage work on the formation of soft skills.

However, it is rather challenging to account for each and every soft skill. Furthermore, the use of soft skills assumes the ability to use different models of behavior even in the same situations, to understand one's own interests and those of other stakeholders, to promptly and clearly set priorities, make the optimal choice from alternatives, quickly adapt to new challenges and circumstances, be resistant to strain and stress, and achieve the goals set (Evans Allvin, 2016).

As argued by researchers (Iorio, 2022; Vasanthakumari, 2019), the labor market has the highest demand for the following soft skills: complex multi-level problem solving, critical thinking, creativity in a broad sense, ability to lead and interact with people, emotional intelligence, forming personal opinions and making decisions, logic and negotiation skills, and flexibility of mind. The results of our study on a sample of potential school graduates partially confirm these observations.

Furthermore, researchers and specialists in recruiting and employment highlight the following key skills:

- leadership skills (ability to control and direct other workers, forge relationships between management and subordinates through the organizational chain; evaluate, motivate, reward, and discipline employees; build teams, resolve conflicts, and shape the desired culture of the organization; understand how to influence people and satisfy their needs, etc.) (Sopa et al., 2020);

- teamwork skills (given that most employees are part of a team/department/division, and even those not included in the official team need to cooperate with other people) (Succi, 2015);

- communication skills (success in communication involves five components: verbal communication concerns the ability to speak clearly and concisely; non-verbal communication refers to the ability to project positive body language and facial expressions; written communication implies skill in drafting text messages, reports, and other types of documents; visual communication implies the ability to convey information with images and other visual aids (active listening helps to listen and hear others) (Bishop, 2017);

- problem-solving skills (ability to apply one's knowledge in finding answers to pressing questions and formulating weighted solutions, discussing mistakes, holding responsibility, etc.) (Batsunov et al., 2018);

- work ethic (adherence to work rules, punctuality, time management, goal setting and result-oriented work, etc.) (Sopa et al., 2020);

- flexibility/adaptability (in today's rapidly changing world, these qualities take on new value; it is important to be able to cope with many different tasks and to be willing to take on responsibilities that may lie outside one's own sphere of competence) (Iorio, 2022);

- Interpersonal skills (the ability to build and maintain relationships, develop them, and use diplomacy; the ability to express and receive constructive criticism, to be tolerant and respectful of others' opinions and empathize with them; these skills are among the most important, as they are central to team building and trusting relationships).

Among the limitations of the study, we can note the insufficient number of educational institutions involved in the pedagogical experiment. Prospective further research could focus on the process of soft skills development in other age groups of school students using other tools, such as game methods.

## 6. Conclusion

Our study aimed to explore the impact of project-based learning on the development of soft skills among high school students in Kazakhstan. The results affirm our initial hypothesis, revealing that PBL significantly contributes to the enhancement of essential soft skills, thereby validating the effectiveness of innovative pedagogical strategies in contemporary educational settings. This evidence substantiates the argument for a paradigm shift in educational practices, advocating for the broader adoption of PBL methodologies to prepare students for the complexities of the modern workforce and societal engagement.

To build soft skills, school graduates need to recognize the importance of personal development, which requires an active pedagogy approach to teaching. That is, the acquisition of these skills requires active teaching methods, one of which is the project method. A useful means of soft/flexible skills development in school education is the introduction of project activities associated with the curriculum, which provide practical implementation of the acquired knowledge, as well as the problem-based approach, which appeals to the reality and daily challenges faced by students. Another clearly powerful method is group activities, as they allow students to develop a strong sense of identity and realize the value of teamwork, which helps them achieve better results in their daily work and personal activities. Thus, the use of project methods in teaching high school students has great potential both in activating cognitive interest and improving the quality of perception of educational material, and in building a wide range of soft skills. Summarizing our findings on the practical aspects of soft skills development, we highlight the need to replace traditional passive pedagogics, which is limited to the transmission of knowledge, with active pedagogics.

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