Developing leadership competencies in university students through project-based learning

Desarrollo de competencias de liderazgo en estudiantes universitarios a través del aprendizaje basado en proyectos

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Abstract

This study aimed to confirm the effectiveness of project methods in cultivating leadership skills among higher education students. The methodology encompassed a questionnaire survey and testing, specifically utilizing the Multifactor Leadership Questionnaire and the Situational Judgement Test. Measures of central tendency, including the arithmetic mean, median, and mode, were applied for data analysis. The study involved a sample size of 140 participants. Additionally, inductive statistical methods such as t-statistics, the Shapiro-Wilk test, and Cohen's d were employed to analyze the data. The findings indicate that students

in the experimental group demonstrated a higher level of leadership qualities, notably in communication (4.7 vs. 4.2) and confidence (4.8 vs. 4.3). Statistically significant differences were observed for the individual approach (t=2.1, p<0.05) and result orientation (t=2.4, p<0.05), thereby confirming the effectiveness of project methods. Key improvements were particularly evident in communication, confidence, and result-oriented skills, underscoring the efficacy of project-based methodologies in higher education. In conclusion, project methods positively influence the development of students' leadership qualities, yielding superior outcomes in the experimental group compared to traditional approaches.

Keywords: active learning, building competencies, innovative education, pedagogical technology, project methods.

Resumen

Este estudio tuvo como objetivo confirmar la efectividad de los métodos de proyecto en el cultivo de habilidades de liderazgo entre estudiantes de educación superior. La metodología abarcó una encuesta y pruebas de cuestionario, específicamente utilizando el Cuestionario de Liderazgo Multifactorial y la Prueba de Juicio Situacional. Se aplicaron medidas de tendencia central, incluyendo la media aritmética, la mediana y la moda, para el análisis de datos. El estudio involucró un tamaño de muestra de 140 participantes. Además, se emplearon métodos estadísticos inductivos como las estadísticas t, la prueba de Shapiro-Wilk y la d de Cohen para analizar los datos. Los hallazgos indican que los estudiantes en el grupo experimental demostraron un mayor nivel de cualidades de liderazgo, notablemente en comunicación (4.7 vs. 4.2) y confianza (4.8 vs. 4.3). Se observaron diferencias estadísticamente significativas para el enfoque individual (t = 2.1, p < 0.05) y la orientación a resultados (t = 2.4, p < 0.05), confirmando así la efectividad de los métodos de proyecto. Las mejoras clave fueron particularmente evidentes en la comunicación, la confianza y la orientación a resultados, lo que subraya la eficacia de las metodologías basadas en proyectos en la educación superior. En conclusión, los métodos de proyectos influyen positivamente en el desarrollo de las cualidades de liderazgo de los estudiantes, obteniendo resultados superiores en el grupo experimental en comparación con los enfoques tradicionales.

Palabras clave: aprendizaje activo, construcción de competencias, educación innovadora, métodos de proyecto, tecnología pedagógica.

Introduction

The relevance of the issue under research is determined by the growing demands of the modern labour market for specialists who combine professional knowledge with universal skills. Today, employers expect employees not only to have technical competencies, but also the ability to effectively manage processes and people. Leadership qualities are becoming an important factor in success in a dynamic professional environment that requires adaptability and strategic thinking (Sviatko, 2024).

There is a growing interest in educational practice towards the implementation of project methods as an approach to training students, which contributes to the development of professional competencies and leadership qualities (Melguizo-Garín et al., 2022). This is particularly important in the context of higher education in Ukraine, where economic and societal transformations demand specialists capable of strategic decision-making and effective teamwork. In view of globalization and constant transformation of the labour market, society needs specialists who are able to effectively organize teamwork, make strategic decisions, etc. The needs of the labour market emphasize the relevance of research aimed at studying the impact of project-based learning on the development of students' leadership qualities (Tretiak et al., 2021).

Leadership qualities are now a key element of successful professional activity (Breaugh et al., 2023). Leadership includes a wide range of competencies: communication skills, the ability to motivate others, strategic thinking and the ability to work in multifunctional teams. In the Ukrainian context, these qualities are particularly vital due to the rapid shifts in organizational structures and work environments. These

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qualities enable specialists to achieve professional goals, but also to ensure the development and sustainability of the organization in which they work (Ince, 2023).

Higher education institutions (HEIs) play a crucial role in the development of leadership qualities, as the prerequisites for the development of personal potential are created during the student years. The Ukrainian education system faces the challenge of modernizing its approaches to meet global standards, making the integration of innovative methods such as project-based learning particularly relevant. Project-based methods that combine theoretical knowledge with practical activities are one of the most effective tools for the development of leadership in HEIs (Birdman et al., 2022). The project-based approach contributes to the development of students' leadership qualities, such as responsibility, the ability to act under uncertain conditions, etc. (Naseer et al., 2025).

The problem of the study is the poorly studied effectiveness of project-based methods for the development of leadership qualities. Despite numerous studies confirming the advantages of the project-based approach, there is also data indicating the limited impact of such methods in certain conditions (Williamson, 2023). This highlights the necessity of exploring how project-based learning methods can be adapted to the unique socio-economic and cultural conditions of Ukrainian higher education. The aim is to theoretically substantiate and empirically confirm the effectiveness of using project-based learning methods to develop leadership skills in higher school students. The study examines key variables such as communication skills, emotional intelligence, and decision-making abilities to evaluate their development through project-based methods. These variables were selected as they represent core leadership competencies required in dynamic and multidisciplinary professional environments. The aim involves the fulfilment of the following research objectives:

1. Determine the influence of project-based methods on the development of students' leadership qualities;
2. Assess the formation of the leadership style of respondents in both groups.
3. Study the respondents' ability to make decisions in various professional situations.

This article is structured into seven main sections. Following the abstract, the introduction establishes the relevance of developing leadership competencies in students and outlines the study's objectives. A comprehensive literature review then synthesizes existing theories of leadership and prior research on project-based learning (PBL), identifying key gaps that this study aims to address. The methods and materials section details the quasi-experimental research design, participant sampling, and the specific instruments used for data collection and analysis. The results section presents the empirical findings, comparing the development of leadership qualities between the control and experimental groups through descriptive and inferential statistics. Subsequently, the discussion interprets these results, contextualizing them within the broader academic discourse and acknowledging the study's limitations. The article concludes by summarizing the key findings and their implications in the conclusions section, followed by a complete list of bibliographic references containing the self-assessment questionnaire used in the research.

Literature Review

Leadership is a multi-aspect social phenomenon, which remains an object of researchers' interest, as it determines the dynamics of the society development. According to Bhat et al. (2024), leadership should be considered not only as the ability of one person to influence others. It is a process that encompasses team development, the formation of common goals, and the creation of conditions for achieving effective results. We agree with the researchers' statement and propose to consider the development of leadership as an integrated process.

Barner-Rasmussen et al. (2024) argue that classical leadership theories lay the foundation for understanding this phenomenon. They focus on such aspects as personality traits, leader behaviour, and the dependence of its effectiveness on the situational context. According to Gring-Pemble et al. (2024),

behavioural theories emphasize actions that ensure the organization and motivation of the group. Situational approaches add the perspective of adaptation: leadership becomes effective only if the context and needs of subordinates are taken into account. In their book, Carducci et al. (2024) analysed modern leadership concepts, such as transformational, servant, and value-oriented. Transformational leaders inspire and develop their subordinates, servant leaders serve their interests, and value-oriented leaders unite the team with common moral principles. We agree with the researchers' opinion and believe that effective leadership is possible only if the context of production tasks and the needs of the team are taken into account.

As Zhang & Ma (2023) emphasize, project-based learning methods are an effective tool for modernizing the educational process. They contribute to the development of students' practical skills and key competencies. According to the researchers, they create conditions under which students are actively involved in solving real problems through the implementation of specific projects. The study of Riyanti et al. (2023) distinguishes the main approaches of project-based learning methods. They imply the integration of theoretical knowledge with practical experience, the interdisciplinary nature of tasks, result orientation, and cooperation in teams. The authors indicate that project-based methods are aimed at learning the material and developing students' independence, responsibility, communication, and critical thinking. We support the position of the researchers and believe that project-based learning methods contribute to the development of key students' competencies through practical activities.

Project activities play a key role in the educational process, as they contribute to the development of critical thinking through problem analysis and the search for optimal solutions. Huang et al. (2023) noted that it stimulates creativity, encouraging students to propose non-standard approaches and show initiative. According to the researchers, working in project teams develops skills of cooperation and effective communication, which are important aspects of training specialists for professional activity. We share the researchers' position and are convinced that project activities contribute to the development of critical thinking, creativity, and team interaction. The opinion of Balleisen et al. (2024) that project-based learning methods are closely related to the development of leadership qualities, contributing to the development of key competencies is worth noting. They help students to acquire planning and organizational skills, make decisions under uncertain conditions, improve communication, motivate the team and work together. According to the authors, project activities contribute to the formation of responsibility and initiative, which is the basis of effective leadership. We agree with the researchers' opinion and believe that project-based learning methods develop leadership qualities, contributing to the development of key competencies.

Research into the effectiveness of project-based learning methods for developing leadership skills has attracted considerable researchers' attention. The analysis of Zahroh et al. (2023) shows that project activities contribute to the development of leadership skills. This is determined by the students' involvement in teamwork, the distribution of roles and responsibilities, as well as the orientation towards achieving a specific result. The study of Safitri et al. (2024) emphasizes the importance of project methods for the formation of leadership competencies. In particular, the researchers focus on promoting the development of skills such as delegation of authority, team motivation, and the ability to adapt to change. We share the researchers' opinion and believe that project methods contribute to the development of leadership skills through cooperation and distribution of responsibilities.

While most existing literature highlights the benefits of project-based methods (Hasanah et al., 2023); (Chang, 2021), critical gaps remain. Empirical studies such as Sviatko (2024) reveal contextual limitations, particularly in non-Western educational settings, where institutional support and teacher preparedness moderate outcomes. Similarly, Shekarian & Parast (2021) identify gender disparities in leadership skill acquisition, a factor underexplored in prior research. Pan et al. (2024) further emphasize the role of teacher training—a variable often overlooked in studies claiming universal efficacy.

This study addresses these gaps by (1) examining project-based methods in Ukrainian HEIs, a context with limited empirical coverage; (2) incorporating gender-disaggregated analysis; and (3) evaluating

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teacher support as a moderating factor. By testing the hypothesis (H_1) that project methods enhance leadership skills, we aim to provide nuanced insights beyond the dominant positive narrative.

Methods and materials

Research design

A quasi-experimental research design was developed. The research consisted of several stages. The duration and content of each stage are presented in Figure 1.
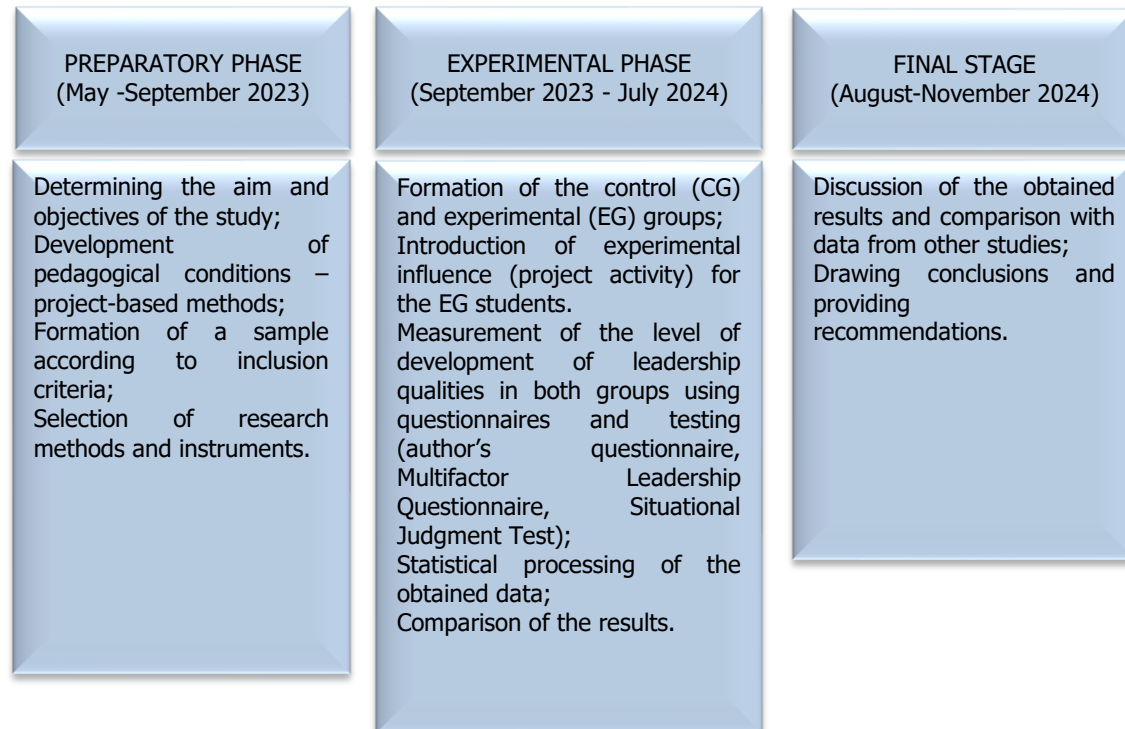
PREPARATORY PHASE (May -September 2023)	EXPERIMENTAL PHASE (September 2023 - July 2024)	FINAL STAGE (August-November 2024)
Determining the aim and objectives of the study; Development of pedagogical conditions – project-based methods; Formation of a sample according to inclusion criteria; Selection of research methods and instruments.	Formation of the control (CG) and experimental (EG) groups; Introduction of experimental influence (project activity) for the EG students. Measurement of the level of development of leadership qualities in both groups using questionnaires and testing (author's questionnaire, Multifactor Leadership Questionnaire, Situational Judgment Test); Statistical processing of the obtained data; Comparison of the results.	Discussion of the obtained results and comparison with data from other studies; Drawing conclusions and providing recommendations.

Figure 1. Research Stages

Sampling

The general population consisted of Ukrainian students. The sample included 3rd-year students of the National University of Life and Environmental Sciences of Ukraine (A), Faculty of Humanities at the Department of Social Work and Rehabilitation; Institute of In-Service Education Borys Hrinchenko Kyiv Metropolitan University, the Department of Science and Mathematics Education and Technologies (B); Department of Socio-Humanitarian and Legal Disciplines of the Faculty of State Security of the Kyiv Institute of the National Guard of Ukraine (C). The sample size was 140 people, who were divided into two groups – the EG and CG. The groups were distributed evenly with the same conditions (Table 1).

Table 1.
Demographic characteristics of participants (N = 140)

Variable	Experimental Group (n=70)	Control Group (n=70)	Total
Age (years)	20.5 (SD=0.8)	20.3 (SD=1.0)	20.4 (SD=0.9)
Gender			
- Female	44 (63%)	43 (61%)	87 (62%)
- Male	26 (37%)	27 (39%)	53 (38%)
University			
- University A	25 (36%)	25 (36%)	50 (36%)
- University B	23 (33%)	23 (33%)	46 (33%)
- University C	22 (31%)	22 (31%)	44 (31%)

Note: Values represent n (%) or mean (SD). University names anonymized for review.

They concern the number of participants, their characteristics (age, gender, level of training), which ensures balance and avoids bias in the research results. This approach is aimed at increasing the objectivity and reliability of the obtained data. Such a number of participants for pedagogical research ensures the objectivity and impartiality of the study. The pedagogical conditions of an interdisciplinary project were involved in the EG. The CG students studied according to the usual curriculum. Inclusion criterion: to be in the third year of one of the HEIs participating in the study. The sample was formed using simple random selection. Such a number of respondents, the sampling method, and the inclusion criterion ensures obtaining reliable results. The participants of the experiment provided informed consent to personal data processing and the publication of the research results.

The experimental group (EG) underwent a specialized 10-month leadership development program using project-based methods, including interdisciplinary projects, simulation exercises, and mentor-guided activities designed to cultivate leadership competencies. Meanwhile, the control group (CG) continued with traditional coursework without these interventions.

To ensure valid comparisons, several measures were implemented. Both groups were carefully matched on key demographic variables including age, gender distribution, and academic background. The same assessment tools (MLQ and SJT) were administered to both groups under identical conditions. Instructors for the CG were deliberately kept separate from the project-based training methods to prevent contamination of results.

The HEIs participating in the study ran an interdisciplinary project: Forming a Future Leader: Synthesis of Social Work, State Security, and the Humanities. It aimed to bring together specialists from various fields to create a comprehensive programme for developing leadership qualities in young people. The project covered three key areas. The theoretical study focused on analysing leadership concepts, identifying the competencies of a 21st-century leader, and creating a model that meets modern requirements. The practical component includes trainings, seminars, simulation games, and the development of online platforms for self-study. The project conducted a series of trainings, seminars, and workshops aimed at developing communication, organizational, and management competencies. A number of simulation games were also conducted, where students had the opportunity to gain practical experience in solving complex issues

Methods

The study employed psychometric and testing methods, as well as questionnaire survey. The obtained results were processed using descriptive and inductive statistical methods. The following methods were used.

1. *Leadership Qualities Self-Assessment Questionnaire*. The method assessed the readiness of higher school students to perform leadership roles in their future professional activities. The questionnaire made it possible to identify the respondents' strengths and weaknesses in the field of leadership. The

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variables that were measured: communication skills, emotional intelligence (EI), decision-making skills, organizational skills, self-confidence, result orientation, and teamwork.

2. *Multifactor Leadership Questionnaire (MLQ).* The method assesses different leadership styles, in particular transformational and transactional. It helps to understand how leaders affect the organization as a whole. MLQ helps to identify leadership strengths and weaknesses and develop programmes to develop the necessary qualities (Batista-Foguet et al., 2021).

3. *Situational Judgement Test (SJT).* The test assesses the ability of an individual to make effective decisions in various professional situations. It helps to determine how well candidates understand the requirements of the job role and can apply their knowledge and skills to solve problems. It enables comparing groups of participants according to the level of development of certain competencies, for example, experienced workers with new ones.

4. The *measures of central tendency* were used in the study to analyse the results, in particular, the *arithmetic mean, median,* and *mode*. The arithmetic mean determined the general level of developed leadership qualities among students who participated in the project. The median revealed the middle point of the distribution of indicators, taking into account possible asymmetry in the data. The mode determined the most frequent values, reflecting common trends in the development of students' key leadership competencies.

5. *The Shapiro-Wilk test* was used to test the assumption of a normal distribution of data on the level of development of leadership skills in each of the groups. The absence of statistically significant deviations from the normal distribution ($p > 0.05$) allowed the use of the parametric t-test.

6. *The Student t-test* for independent samples was used to compare the average values of leadership skills in the EG (project methodology) and CG (traditional methodology). Exceeding the calculated t-test value above the critical one indicated rejection of the null hypothesis of no differences between the groups and confirmed the positive impact of the project methodology.

7. *Cohen's d* was calculated to assess the effect size of the project methodology on the development of leadership skills. The value of this coefficient determined the practical significance of the obtained results. In particular, the value of $d \geq 0.8$ indicates a large effect of the project methodology.

Instruments and validation

The Leadership Qualities Self-Assessment Questionnaire was developed based on a comprehensive literature review to identify key leadership constructs such as communication, emotional intelligence, decision-making, organizational skills, self-confidence, and result orientation. The initial draft underwent expert validation by three psychologists, with a content validity ratio (CVR) of at least 0.75 for all retained items. Pilot testing with 30 students demonstrated strong internal consistency (Cronbach's α = 0.82). The final questionnaire consisted of 30 items, evenly distributed across the six constructs.

For the Multifactor Leadership Questionnaire (MLQ), reliability and validity were ensured through established psychometric standards. Subscale reliability ranged from Cronbach's α = 0.84 to 0.91. Confirmatory factor analysis (CFA) supported construct validity, with comparative fit index (CFI) = 0.92 and root mean square error of approximation (RMSEA) = 0.06. The Situational Judgement Test (SJT) maintained high inter-rater reliability (intraclass correlation coefficient, ICC = 0.89).

The MLQ and SJT were administered in their original English versions, following a rigorous back-translation process to ensure linguistic accuracy. The self-made questionnaire incorporated adapted items from Zahroh et al. (2023) and Zhang & Ma (2023), with modifications to reflect culturally relevant examples from Ukrainian educational settings.

Google Forms were used to collect data in this study, which provided a quick and convenient way to collect responses from respondents. This instrument allowed for automatic data structuring, which reduced the risk of errors during their initial processing. Statistical packages such as SPSS and Python (in particular, the NumPy and SciPy libraries) were used to analyse the results. These tools provided accurate calculations, the ability to visualize data, and statistical testing of hypotheses.
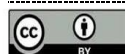
Results

The variables reflecting the leadership qualities of the individual were measured after applying the pedagogical conditions. The questionnaire survey was aimed at identifying the development of the main groups of leadership qualities. The results obtained during the study of self-assessment of leadership qualities in both groups are presented in Table 2.

Table 2.
Results of processing the students' self-assessment of leadership qualities

Variable	Group	Arithmetic mean	Median	Mode	Cohen's d	Conclusions
Communication skills	CG	4.2	4	4	0.35	Medium level
	EG	3.8	3	3		
EI	CG	3.9	4	3, 4	0.25	Low level
	EG	3.6	3	3		
Decision-making skills	CG	4.1	4	4	0.4	Medium level
	EG	3.7	3	3		
Organizational skills	CG	3.8	4	4	0.3	Medium level
	EG	3.5	3	3		
Self-confidence	CG	4.3	4	4, 5	0.5	Medium level
	EG	3.9	3	3		
Result-orientation	CG	4.2	4	4	0.45	Medium level
	EG	3.7	3	3		
Teamwork	CG	4.0	4	4	0.38	Medium level
	EG	3.6	3	3		

Source: Created by the authors based on research results

For the CG group (n = 70), the p-value according to the Shapiro-Wilk test is 0.63, which is greater than 0.05, so we do not reject the null hypothesis of normal distribution. Similarly, the p-value is 0.71 for the EG group (n = 70), which is also greater than 0.05, confirming the normality of the distribution. SO, as the p-value is greater than 0.05 for both groups, the distributions can be considered normal, which makes it possible to apply parametric methods, in particular the t-test.

Analysis of the results makes it clear that the average indicators in the CG are higher than in the EG. Such data indicate a better self-assessment of leadership qualities in the CG students. The Cohen's d ranges from 0.25 to 0.5, which indicates a small or medium effect size. The largest effect was observed for self-confidence (d = 0.5), while EI had the smallest effect (d = 0.25). This demonstrates a moderate difference between groups, which may indicate a limited impact of the learning method on the development of leadership qualities.

The next step was to study the characteristics of the formation of the respondents' leadership style. The MLQ method was used for this purpose. The obtained results are presented in Table 3.

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Table 3.
The peculiarities of the leadership style of the Cg and Eg respondents

Scale	Statistics	CG	EG	t-test	p-value
Idealized Impact	Mean	3.5	4.2	1.8	0.09
	Median	3.5	4		
	Mode	3	4		
Individual Approach	Mean	2.8	3.6	2.1	0.05*
	Median	3	3.5		
	Mode	2	4		
Contingent Reward	Mean	4.1	3.2	-1.5	0.15
	Median	4	3		
	Mode	4	3		

*p < 0.05 – statistically significant difference
Source: Created by the authors based on research results

Analysis of the table shows that on the Idealized Impact scale, the mean value in the EG is higher than in the CG, but the difference is not statistically significant (p = 0.09). On the Individual Approach scale, the average value in the EG (3.6) also exceeds the CG indicator (2.8), and this difference is statistically significant (p = 0.05). The opposite trend is observed on the Contingent Reward scale: the mean value in the CG exceeds the EG indicator, but the difference does not reach statistical significance (p = 0.15). So, the results indicate an improvement in the Individual Approach indicators in the EG, which confirms the effectiveness of pedagogical conditions.

The respondents' ability to make decisions and take responsibility was investigated to assess the effectiveness of project methods. The SJT methodology was applied. The obtained results are presented in Figure 2.
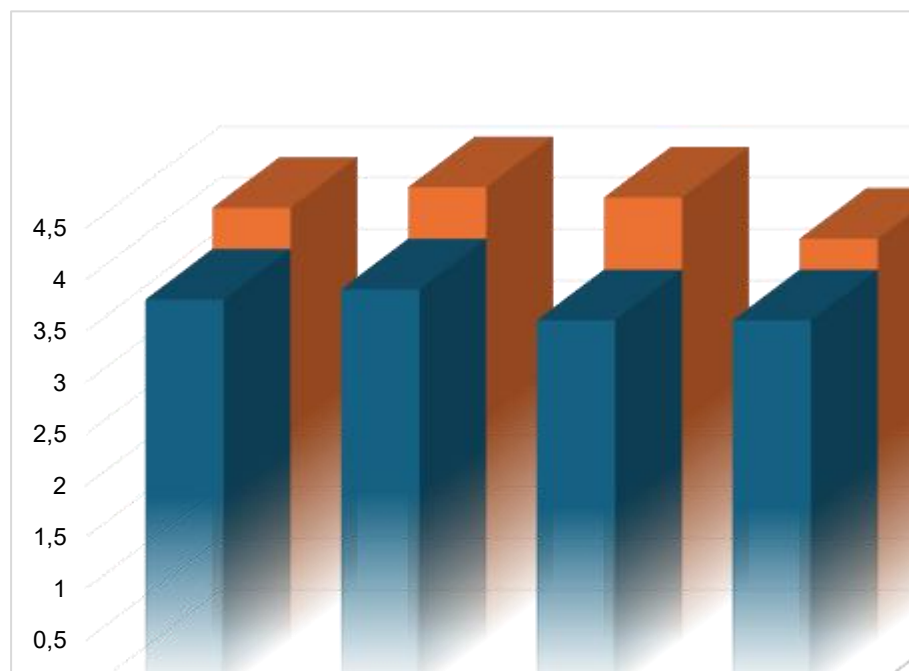
***Figure 2.** Results for the study of the ability of the Cg and Eg respondents to make decisions and take responsibility using the sjt method*
Source: Created by the authors based on research results

The obtained statistical data showed that significant differences were found between the groups for the Realism, Objectivity, and Predictive Validity variables. The EG participants were more realistic (t = 2.5, p = 0.02) and more objective (t = 3.2, p = 0.001), and also had a better ability to predict success (t = 2.8, p = 0.01). For the Complexity variable, the difference between the groups was not significant (t = 1.8, p = 0.09). The standard deviation ranged from 0.6 to 0.9, which indicates some variability in the participants' responses. This indicates that the EG has a more positive perception of the tool in these aspects. The small variability of the standard deviations indicates moderate consistency of the responses among the participants, although some difference in the assessments still exists. The obtained research results give grounds to conclude that hypothesis H_1 was correct. Based on the actual data, it should be accepted that the use of project-based learning methods contributes to the development of leadership skills in higher school students. Hypothesis H_0 should be rejected.

Discussion

The obtained results indicate that the implementation of project-based methods has a positive effect on the development of students' leadership qualities. In particular, a significant increase in the mean values on individual leadership scales, such as individual approach and result orientation of the EG, was found. Such data indicate the effectiveness of the implemented methods for the development of key competencies necessary for future specialists. This gave grounds to confirm the alternative hypothesis that project methods of learning can improve leadership qualities of higher school students.

Project methods play an important role in the development of leadership qualities, as they create conditions for active students' interaction, development of independence, and responsibility. As Tambak et al. (2024) and Asgari et al. (2020) noted, students learn to effectively organize their own work in the process of implementing projects in order to achieve a common result. According to the researchers, such methods contribute to the creation of an individual approach to solving problems, which is a key component of modern leadership. Their findings coincide with the data obtained in our study. We agree with such assessments of the role of project-based methods.

The results of the studies by Oubrich et al. (2021) and Gunarathna et al. (2024) provide grounds to substantiate the conclusions obtained in our study. The researchers emphasize that thanks to the flexibility of the project approach, students develop the ability to adapt to changing conditions, analyse complex situations, and make strategic decisions. These findings are important for the training of specialists for whom leadership skills are becoming an important factor in increasing competition in the current dynamic environment. The data presented by the researchers confirm that project methods stimulate the development of such competencies as result orientation, self-confidence, and teamwork.

There are studies that indicate the low effectiveness of project-based methods in the development of leadership qualities. The works of Tambak et al. (2024) and Rony et al. (2023) are worth mentioning here. According to the researchers, an important role in the results of such studies is played by insufficient teacher training and limited support during the educational process. They state that project-based methods require not only the active participation of students, but also deep organizational work from the HEI at all stages.

The opinion of Melean Romero et al. (2023) that in some cases students are not sufficiently prepared for independent work may also be interesting. This, in turn, can lead to a decreased effectiveness of project-based methods. Furthermore, according to Soni et al. (2023), the lack of a clear structure and defined criteria for evaluating the results of project activities can lead to unrepresentative conclusions. The low effectiveness of project-based methods may be explained by insufficient methodological training and individual characteristics of students that limit their potential.

We do not exclude the possibility that project methods cannot be the only universal tool for the development of leadership qualities. However, as the results of this study show, they significantly contribute to their formation and development. In support of our position, we suggest the works of Kolomboy et al. (2021) and

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Hasanah et al. (2023). Both groups of researchers indicate that project-based methods, in combination with other methods of developing leadership qualities, significantly improve the result. In our opinion, we should consider these conclusions and continue studying effective methods of developing students' leadership qualities.

The practical significance of the study is that its results can be used to improve the learning process and develop students' leadership qualities. In particular, the introduction of project-based methods into the educational process can contribute to a more effective development of leadership competencies. The obtained data can become the basis for developing methodological recommendations for teachers, which will enable adapting curricula to modern requirements. The theoretical significance of the study is to expand academic ideas about the effectiveness of project-based methods in the development of leadership qualities. The results can help to develop theories of leadership, taking into account new approaches to learning and the development of competencies through practical methods.

Limitations

Limitations of the study include the small sample size of students, which may affect the generalizability of the results. Besides, the study was conducted at only three HEIs, which limits its representativeness. The use of student self-assessments may be subjective and requires additional objective assessment methods.

Recommendations

Leadership development through project-based learning requires the integration of real-world tasks that encourage responsibility and teamwork. Teachers should provide methodological support and create conditions for the active students' involvement in all stages of the project. Particular attention should be paid to the development of communication skills and the ability to work under uncertain conditions. It is advisable to use digital tools and organize interdisciplinary projects in order to increase the effectiveness of project-based learning.

Conclusions

The relevance of the obtained research results is determined by the need to transform traditional teaching methods to adapt to the current requirements. Project-based methods are one of the tools that allow developing students' leadership qualities and preparing them to solve complex tasks. This study contributes to the extant literature by: (1) providing empirical evidence that project-based methods significantly enhance leadership skills (e.g., communication, confidence) in Ukrainian higher education contexts, where such research was previously limited; (2) demonstrating that structured interdisciplinary projects (e.g., simulations, mentorship) are more effective than traditional curricula for fostering result-oriented leadership; and (3) identifying individual approach ($t=2.1$, $p<0.05$) as a critical yet underexplored dimension of leadership development in project-based learning. The obtained results indicate a positive impact of project-based methods on the development of students' leadership qualities. A comparison of groups that studied using project and traditional methods showed that the EG students who used project-based methods achieved higher results in the development of leadership qualities. In particular, the indicators of communication (4.7 compared to 4.2) and confidence (4.8 compared to 4.3) were higher. Statistically significant differences were confirmed by the criteria of an individual approach ($t=2.1$, $p<0.05$) and result orientation ($t=2.4$, $p<0.05$). Project-based methods contribute to the more effective development of key leadership competencies, such as individual approach and teamwork skills, which are important for future specialists. The obtained results are quite important and can be used to improve educational programmes of higher education institutions aimed at developing students' leadership qualities. In particular, project-based methods can be integrated into specialized trainings, management and teamwork courses, as well as in interdisciplinary educational initiatives. Further research may focus on the impact of project-based methods on various aspects of students' professional training in different fields. They may focus on the

implementation of digital tools in project activities to study their impact on the development of leadership competencies.

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