

# Experiences of the Introduction of Project-Based Learning at Széchenyi István University

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## Abstract

The aim of this study is to present the experiences and outcomes of introducing project-based learning (PBL) in higher education, with a particular focus on preparing students for the labor market. PBL was introduced on a pilot basis in the fall semester of the 2024/2025 academic year in 12 undergraduate programs at Széchenyi István University. The research employed both qualitative (interviews, “Lessons Learned” workshop) and quantitative (362-student questionnaire) methods. According to the results, PBL effectively develops skills relevant to the labor market by engaging students in tasks based on real-world problems. Instructors highlighted the benefits of active, student-centered learning, while the redesign of courses and the selection of appropriate projects emerged as challenges. Students reported positive experiences, particularly in teamwork, problem-solving, and the application of practical knowledge. The research highlights that successful PBL integration requires thorough planning,

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ongoing faculty support, and institutional backing.

**Keywords:** Project-based learning; higher education; innovation; soft skills

## Introduction

Project-based learning, as one of the most essential types of practice-based training, is increasingly important at all levels of education (Guo et al., 2020). Today, there is both a demand and an expectation for introducing this type of course, especially from employers, to enable workers with the right competencies to integrate more quickly into the corporate sphere and to create value effectively (Frank et al., 2003).

This method also helps link the labour market and higher education, as companies can provide universities and university courses with the tasks and project ideas to be developed, which benefits both parties (Bell, 2010).

The strategic goal of Széchenyi István University is to innovate education, including the widespread introduction of project-based learning. The reason for the planned development of training is the lack of socialisation, but it would also be essential to implement competence assessment during training. In addition, the new strategic objectives also place great emphasis on strengthening soft skills to help students find their place in the labour market.

The Student Project Support Programme aimed to pave the way for the introduction of project-based education by:

- Established the Student Project Support Programme as an organisational unit.
- Provided the appropriate methodologies for all stakeholders, in collaboration with the Directorate General for Methodology, Digital and Teacher Training.
- Launched the first project-based training courses on a pilot basis.

The project was launched on May 1, 2024, as part of the University's training and development activities. Its principal activities, in line with its objectives, are the creation of the Student Project Support Programme, the provision of methodologies, the launch of the pilot training courses, and project management and communication.

As a methodological and organisational unit, the Student Project Support Programme registers and coordinates student projects, which focus on two areas: university and company projects linked to subjects and training courses. In the first semester of university courses, students are introduced to the basics

of project management, and they mainly work on university problems and plan institutional developments. In the second semester, they deal with issues and developments in local (or national) companies.

## Literature review

Project-based learning (PBL) (Kövecsesné Gósi, 2023) involves students working on complex, open-ended, often interdisciplinary problems that require research, analysis, creativity, and collaboration. It focuses on authentic, real-world projects, helping students apply theoretical knowledge in practical contexts and develop a deeper understanding of the subject (Doppelt, 2003)

A key advantage of PBL is that it strengthens critical and analytical thinking, as students must evaluate multiple perspectives and develop well-reasoned solutions (Kovecses-Gosi, 2019). It also enhances problem-solving skills and encourages active, hands-on learning. In addition, presenting project outcomes to real audiences improves communication and public speaking skills, while feedback supports reflection and continuous improvement (Marnewick, 2023). This helps them develop analytical and critical thinking skills that they can apply in other situations in the future (Bell, 2010).

An international perspective on project-based learning is presented in Table 1.

Institution	Description
Polytechnic Institute of Cávado and Ave (2025)	The FASA combines hard skills, project work, and soft skills; ends with a 2-week company project.
Phil Cocchiola (2020); Zeppelin University (2011)	Student Project Offices mainly support student initiatives and activities.
(Guo et al., 2020)	Provides support for planning and writing project proposals.
NHL Stenden University of Applied Sciences (2025)	Design-based education focused on “learning by doing.”
Väänänen et al. (2023)	Interdisciplinary, industry-linked projects (1–16 weeks), also supporting pedagogy.
España & Soosaar (2022)	Annual project competition with funded student ideas.
Hartescu (2020); Lancaster University (2025)	~200 real business projects/year with strong industry collaboration and support structures.
University of Edinburgh (2025)	Team-based business projects (10 weeks) with company involvement and a structured timeline.

Table 1. International experience of project-based learning (Source: own compilation).

There are no known methodological centres of this kind in Hungarian universities. However, student projects are being launched elsewhere (e.g. Debrecen - Student Innovation Idea Development Programme or the Project Conference on Project-Based Learning at Óbuda University).

## Materials and methods

### Research design

This study applies a mixed-method case study approach to explore the introduction and early implementation of project-based learning (PBL) at Széchenyi István University. The case study design was chosen to provide an in-depth understanding of a real institutional intervention within its authentic context, while the mixed-method approach enables the triangulation of qualitative and quantitative data.

RQ1: How is project-based learning implemented in a higher education institutional context?

RQ2: What are the perceived outcomes of this implementation from student and instructor perspectives?

RQ3: What lessons can be drawn from the pilot phase to support large-scale institutional adoption?

### Research context

Figure 1 illustrates the stages involved in implementing project-based education. For the course to be implemented in the autumn semester, instructors will receive training materials: theoretical materials, practical examples, and tests. The knowledge material of the Project Management course supported the theoretical part.

The study was conducted during the pilot phase of PBL implementation in the 2024/2025 academic year across 12 undergraduate programmes. During the study, courses were deliberately selected from various faculties and fields of study at the university, ensuring that the participating students represented a wide range of majors and disciplines.

Phase I.	Phase II.	Phase III.
2024/25/1 -2024/25/2	2025/26/2 -2026/27/1	2030
<input checked="" type="checkbox"/> Pilot courses in 12 Bachelor programs <input type="checkbox"/> Pilot courses with external corporates/partners	<input checked="" type="checkbox"/> Compulsory course in 12 Bachelor programs <input type="checkbox"/> Involvement of other programmes by launching a pilot course	<input type="checkbox"/> Compulsory project-based course in all Bachelor programmes

Figure 1. Stages of implementing project-based learning. (Source: own compilation).

The quantitative component is based on a questionnaire completed by 362 students, representing approximately 70% of those participating in the pilot courses. Data were collected in two consecutive semesters (199 students in the first semester and 163 in the second).

The qualitative component includes:

- in-depth interviews with instructors involved in the pilot courses, and
- a Lessons Learned workshop, where instructors reflected collectively on their experiences.

### Data collection

A structured questionnaire using a five-point Likert scale (1 = absolutely not, 5 = absolutely) was administered to students at the end of each semester. The questionnaire focused on:

- perceived contribution of PBL to learning,
- development of practical skills,
- teamwork and collaboration,
- and open-ended questions on experiences and suggestions.

Qualitative data were collected through:

- semi-structured interviews conducted during the semester, focusing on instructional challenges and course redesign, and
- a Lessons Learned workshop, where instructors discussed their experiences, challenges, and best practices in a guided group setting.

In addition, students' open-ended responses in the questionnaire were included as qualitative data.

## Data analysis

Quantitative data were analysed using descriptive statistical methods, including frequency distributions and percentage analysis, to identify patterns in student perceptions across the two semesters.

Qualitative data were analysed using a thematic content analysis approach. Responses from interviews, workshops, and open-ended questionnaire items were coded and grouped into thematic categories. The analysis focused on identifying:

- perceived benefits,
- challenges,
- and recommendations for improvement.

## Validity and reliability

The study enhances validity through methodological triangulation, combining multiple data sources (student surveys, instructor interviews, and workshop discussions). The inclusion of both student and instructor perspectives provides a more comprehensive understanding of the phenomenon.

However, the findings should be interpreted with caution, as they are primarily based on self-reported perceptions rather than objective performance measures.

## Conclusions of the Lessons Learned workshop experience and in-depth interview

The lessons learned from the workshop experiences and the results of in-depth interviews with teachers after the introduction of project-based learning are presented in three parts.

### Positive experiences

Introducing project-based learning has brought many positive benefits for teachers and students. Opinions have been collected by category:



Figure 2. Categorising the positive aspects of project-based learning  
(Source: our compilation generated with ChatGPT).

These experiences confirm that project-based learning is more effective and inspiring for both students and teachers.

### Perceived difficulties and shortcomings

The introduction of project-based learning at the university level has encountered several obstacles due to structural, organisational, and motivational problems. Main problems:

At the systemic level: insufficient infrastructure and system support, no standardized PBL-approach, high administrative burden, and weak communication.

Student perspective: challenges in team formation, lack of project management and software skills, fluctuating motivation, unclear expectations, “free-rider” issues.

Teacher perspective: difficulty estimating workload, time-consuming mentoring, motivational challenges, and scheduling issues.

Lack of projects: real projects require external partners, not feasible for all courses, company burden and limited resources.

Developing university infrastructure, supporting participants, and strengthening collaboration with external partners are key to successfully implementing project-based learning.

### Development required for the introduction of PBL

Improvements are needed in several areas to make project-based learning more effective, including administrative simplification, support for students and trainers, and cooperation with enterprises. This section presents proposals for development in these areas.

Administration & systems: simplify administration, introduce S2D and Neptun integration, create a unified assessment and monitoring system, and establish a dedicated unit for corporate relations. The S2D system is a proprietary program used to register projects and their team members. Neptun is a student management system designed for educational administration.

Projects: provide clear guidelines, build project databases, expand partnerships (incl. international), and ensure real, company-based projects.

Teacher training: offer structured training (project management, methods), pedagogical support, and standardized tools/tests.

Students: support interest-based teams, address free-rider issues, and define clear expectations, reporting, and rewards.

Timetabling: ensure clear schedules, introduce flexible formats (e.g. project weeks), allow longer projects, and integrate PBL into courses.

Technology & infrastructure: provide tools, software training, and shared databases.

Strategy: strengthen interdisciplinary and university-wide collaboration and continuously update best practices.

Overall, it can be concluded that the teaching colleagues gained several experiences during the pilot period, which are briefly summarised in Figure 3.

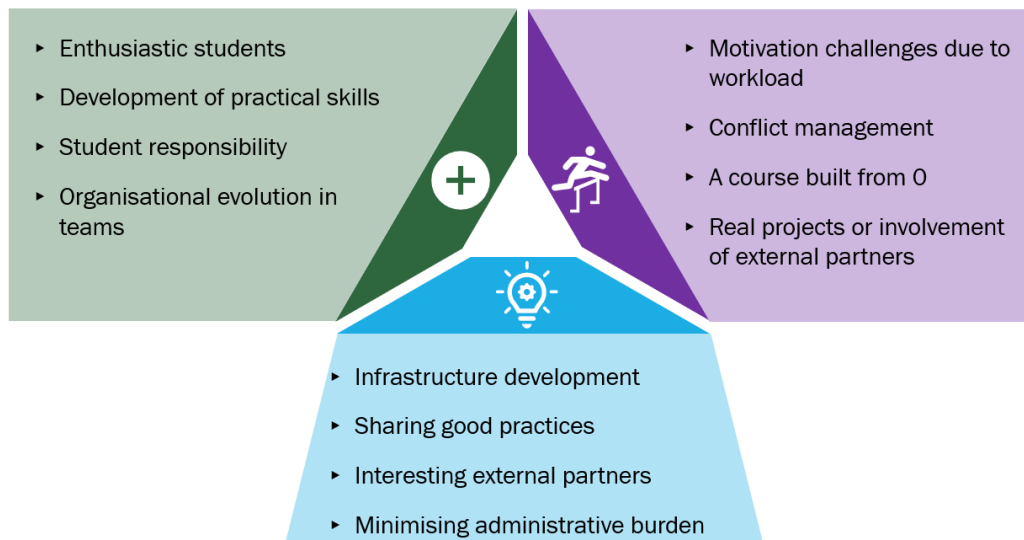


Figure 3. Feedback from teachers. (Source: own compilation).

Integrating the challenges and suggestions can help implement and run project-based learning more efficiently and smoothly in the long term, reducing the administrative burden and increasing participant engagement.

## Analysis of student questionnaire

A total of 362 students from 12 courses completed a questionnaire on project-based learning, 199 in the first semester and 163 in the second semester. This percentage was approximately 70% of the students participating in the pilot program of project-based learning in both cases.

The questions asked how the students evaluated the project-based learning in the pilot semester. The results of the key questions are presented in Figures 4, 5, and 6. For each question, a range of 1-5 was available, where 1 meant "Absolutely not" and 5 meant "Absolutely".

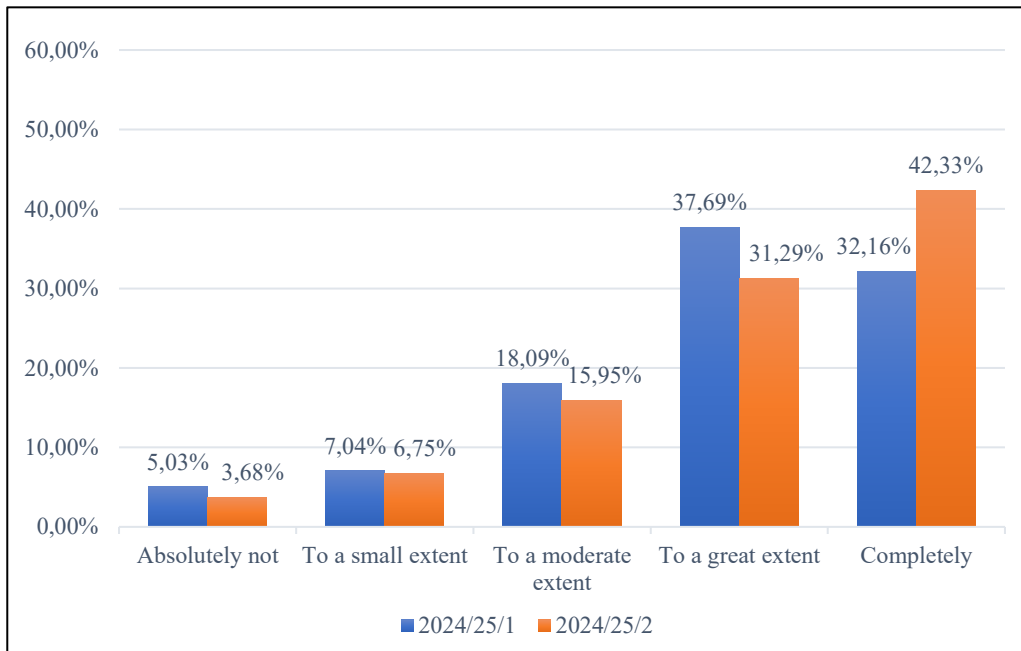


Figure 4. How supportive was the project for your learning process?  
(Source: own compilation)

As shown in Figure 4, in the first semester (2024/25/1), 32.16% of students reported that the project completely supported their learning process, while 37.69% indicated that it contributed to a great extent. Altogether, 69.85% of respondents selected either 4 or 5 on the scale, suggesting that approximately two-thirds of the students perceived the project as making a substantial contribution to their learning.

In the second semester (2024/25/2), the distribution of responses shifted further in a positive direction. The proportion of students selecting “Completely” increased markedly to 42.33%, representing a rise of more than 10 percentage points compared to the first semester. Although the percentage of students choosing 4 decreased to 31.29%, the combined share of the two highest categories increased to 73.62%. At the same time, the proportion of low ratings (1–2) declined from 12.07% to 10.43%.

Overall, these results indicate a modest but clear improvement in students’ perceptions of the project’s effectiveness. The shift from “to a great extent” toward “completely” suggests not only sustained positive evaluation but also a strengthening of students’ confidence in the project’s contribution to their learning process.

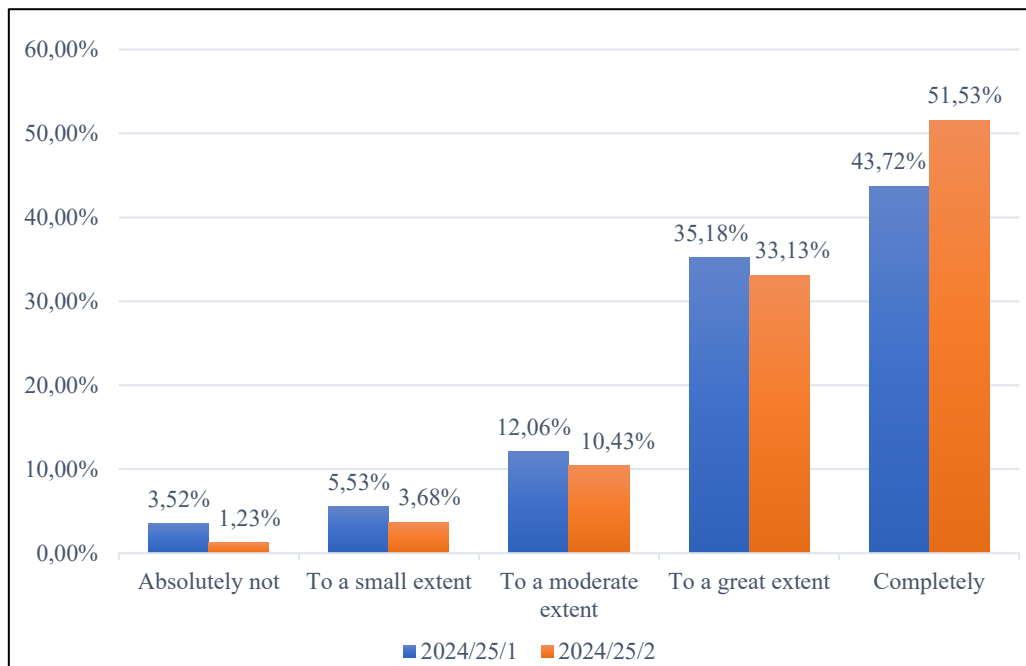


Figure 5. How supportive was the project in developing your practical skills?  
(Source: own compilation).

Figure 5 shows that in the first semester (2024/25/1), 43.72% of the students reported that the project completely supported the development of their practical skills, while a further 35.18% selected 4. Overall, 78.90% of respondents chose one of the two highest categories, indicating that more than three-quarters of the students perceived project-based learning as highly effective in developing their practical competencies.

In the second semester (2024/25/2), a further positive shift can be observed. The proportion of students selecting “Completely” increased to 51.53%, representing a rise of nearly 8 percentage points. Although the percentage of students choosing 4 decreased slightly to 33.13%, the combined share of the two highest categories increased to 84.66%. At the same time, the proportion of low ratings (1–2) declined from 9.05% to 4.91%, while moderate evaluations (3) also decreased slightly.

Overall, the results indicate a clear improvement in students’ perceptions of the project’s contribution to the development of practical skills. The substantial increase in the highest rating category suggests that students in the second semester experienced the project-based approach as even more effective in fostering practical competencies than those in the first semester.

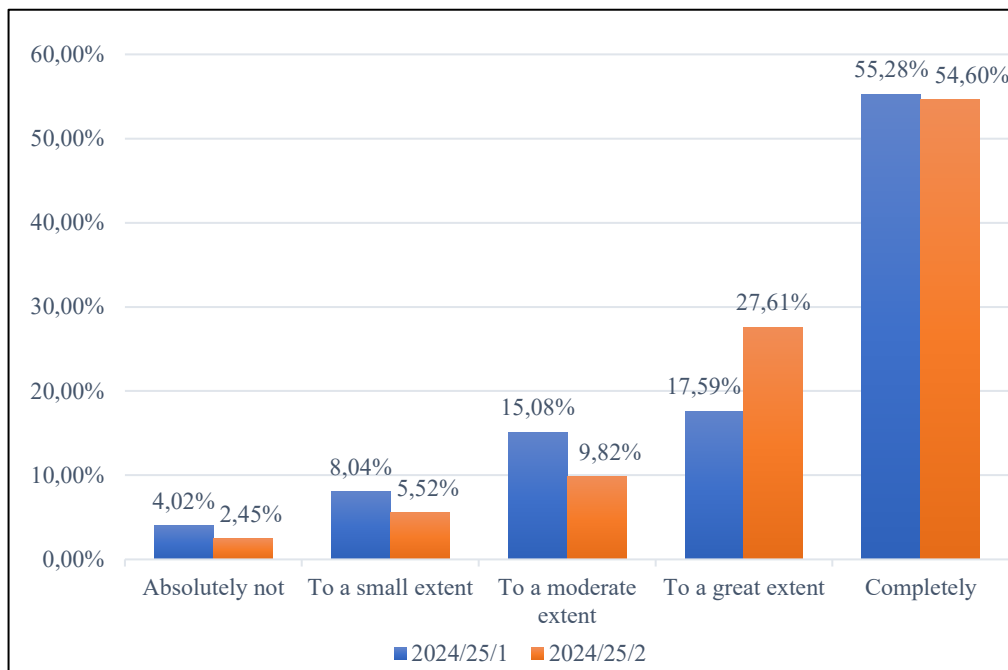


Figure 6. How satisfied were you with teamwork and cooperation between team members? (Source: own compilation).

As shown in Figure 6, in the first semester (2024/25/1), 55.28% of students reported being completely satisfied with group work and cooperation among group members, while a further 17.59% selected 4. In total, 72.87% of respondents chose one of the two highest categories, indicating that nearly three-quarters of the students expressed a high level of satisfaction with teamwork.

In the second semester (2024/25/2), the distribution of responses shows a slight shift. The proportion of students selecting “Completely” remained consistently high at 54.60%, representing only a marginal decrease compared to the first semester. However, the percentage of students choosing 4 increased markedly to 27.61%. As a result, the combined share of the two highest categories rose to 82.21%, reflecting an overall increase of more than 9 percentage points. At the same time, the proportion of moderate and low ratings (1–3) decreased substantially, suggesting a more uniformly positive perception of teamwork.

Overall, while the proportion of students expressing complete satisfaction remained stable at a high level, the increase in the 4-category and the decline in lower ratings indicate a general strengthening of students’ positive attitudes toward group work and cooperation in the second semester.

Regarding the qualitative component, students in both semesters were asked to briefly describe the perceived similarities and differences between project-based learning and traditional face-to-face instruction, as well as to suggest

potential improvements to the project-based approach. The comparison of semesters allows for the examination not only of shifts in overall satisfaction but also of possible changes in students' reflective evaluations of the methodology.

The free-text responses are presented in tabular form and categorised. As a significant proportion of the responses were identical or very similar, the categories were structured by topic for the two questions, which are presented in Tables 2 and 3.

<b>Briefly, in headings, describe the differences and similarities you have found between project-based learning and the traditional frontal teaching approach.</b>	
1. Autonomy and time management	More independence and responsibility, but more complex coordination.
2. Practical learning	More hands-on, interactive, and easier to understand than theory-based teaching.
3. Teamwork and cooperation	Stronger collaboration and communication, but scheduling and unequal participation can be challenging.
4. Creativity and problem-solving	Encourages critical thinking and deeper, more lasting knowledge.
5. Motivation and interest	More engaging, interesting, and enjoyable than traditional methods.
6. Traditional vs. PBL	Traditional = theory-focused; PBL = practical, skill- and communication-oriented.
7. Difficulties and challenges	Time-consuming, coordination difficulties, unclear expectations, and "free-rider" issues.

*Table 2. Differences between project-based and classical learning.  
(Source: own compilation).*

As Table 2 shows, students perceived a significant difference between classical and project-based learning in the free-text feedback. In other words, the benefits of project-based learning were already apparent during the first pilot semester. Table 3 presents the suggestions for improvement.

<b>What and how do you think could or should be changed in the project task in the future? Briefly (max. 3-4 sentences or headings).</b>	
1. Teaching methodology and class organisation	Use a hybrid model (theory + projects), clearer structure, upfront semester planning, and more consultations.
2. Assignments and assessment	Clearer tasks, expectations, and deadlines, with examples from previous years.
3. Teamwork and team dynamics	Smaller teams, defined roles, better communication, and accountability.
4. Deadlines and workload	Better scheduling, fewer overlaps, realistic deadlines, more in-class project work.
5. Practical implementation and technical development	More hands-on sessions, real industry projects, and visual/digital support.
6. Motivation and student enjoyment	More engaging, relevant projects, stronger teacher-student interaction, and team-building support.

Table 3. Student suggestions for project-based learning (Source: own compilation).

Overall, it can be concluded that, in addition to the positive aspects, the students also identified challenges and observations that should be considered in implementing project-based learning.

## Results and discussion

The results show that students generally viewed project-based learning (PBL) as a supportive and effective learning method, particularly in terms of developing practical skills and teamwork. The slight improvement observed in the second semester suggests that both students and instructors are becoming increasingly familiar with the method. These findings are consistent with previous research highlighting the benefits of PBL in fostering engagement and developing applied competencies (Guo et al., 2020).

The qualitative findings complement these observations by revealing the most significant challenges of implementation. Instructors highlighted the increased workload, the lack of standardized processes, and the difficulties of integrating real-world projects. Students also reported problems related to coordinating teamwork and unclear expectations. These results suggest that while PBL has clear pedagogical advantages, its effectiveness depends heavily on institutional support and careful course design.

The study also highlights differences between the perspectives of students and instructors: students primarily experienced the benefits of PBL, while instructors tended to focus on the complexity of implementation. This underscores the importance of structured support systems and clear guidelines.

Overall, the findings suggest that the successful implementation of PBL requires methodological support, advanced infrastructure, and closer cooperation with external partners.

## Conclusions

The introduction of project-based learning (PBL) at Széchenyi István University represents an important step toward practice-oriented educational innovation in higher education. The study's findings suggest that students generally view PBL as a valuable method for supporting learning, particularly in the development of practical skills and teamwork competencies.

At the same time, the results highlight several challenges related to implementation, including increased workload for instructors, organizational complexity, and the need for proper project planning and institutional support. Experiences gathered from both instructors and students underscore that the successful integration of PBL requires careful planning, clear expectations, and ongoing methodological and organizational support.

This study contributes to understanding the early-stage implementation of PBL by embedding the perspectives of students and instructors within a real institutional context. However, the results should be interpreted with caution, as they are primarily based on self-reported perceptions and a single case.

Overall, the results suggest that PBL has great potential in higher education, but its effectiveness depends on a well-structured implementation and sustained institutional commitment.

## Practical recommendations for implementing PBL

Based on the above results and experiences, several general recommendations can be formulated for higher education institutions planning to introduce project-based learning. It is advisable to initially implement PBL on a pilot basis in smaller-scale courses, which provides an opportunity to identify and address methodological and organizational challenges. At the same time, it is essential to provide methodological training and ongoing professional support for instructors, given that PBL requires new pedagogical roles and competencies.

To ensure effective implementation, it is recommended to design projects based on real-world problems, involving external partners where possible, which increases the relevance of the learning process and student motivation. It is also important to establish a clear and transparent assessment system that takes into account both individual and group performance, as well as the learning process and its outcomes.

Finally, the conscious promotion of student collaboration and reflective learning – for example, through the use of structured feedback and self-assessment tools – contributes to a deeper learning experience and the development of complex competencies. Together, these elements can facilitate the sustainable and effective integration of PBL into higher education practice.

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