

MODEL OF PROJECT CLASSES IN PRIMARY SCHOOLS IN WODZISŁAW ŚLĄSKI

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Purpose: The aim of this work is to present a practical example of the process of defining and implementing project-based classes in primary schools in Poland, allowing students of these schools to become familiar with the idea of project-based problem solving.

Design/methodology/approche: The materials analyzed include developed work models, notes from meetings of the team organizing the implementation, and collected post-project comments. Surveys were collected and interviews were conducted with teachers and school principals.

Findings: The publication presents a model that was developed for the organization and implementation of project-based classes in primary schools in Wodzisław Śląski.

Practical implications: The process of creating and verifying the developed solution was presented. The original model of team preparing and then implementing the project, was subjected to practical verification, which enabled the indication of good and bad experiences that were identified during the entire process.

Originality/value: The presented experiences were written from the perspective of the team preparing and implementing the developed solution, and not, as is usually the case, from the point of view of a teacher or student participating in the classes. The developed and verified solution, despite its limitations, can be widely used to organize project classes in primary schools both in Poland and abroad.

Keywords: project management, educational projects, primary education, project management model.

1. Introduction

The education of primary school students is one of the basic obligations of local governments. This is an activity carried out on the basis of the "Education Law" Act. This activity is aimed in particular at educating, raising and caring for students, at the same time, the activity of local government in this area is not only related to statutory provisions. In addition to knowledge and skills resulting from the implementation of the school program, there are often attempts to provide content that is intended to give students the opportunity for

broad development, including functioning at subsequent levels of education or the labor market after completing education. Many activities related to education and training are the result of the activities of local governments themselves which (independently or in agreement with other entities) try to improve and develop the educational process they are responsible in their administrative area. These are common activities throughout the country (they do not occur individually), although they are implemented with varying intensity - it can be said that they concern, in principle, the majority of the student population in Poland. All these activities are perceived as an attempt to strengthen competences and result from the need to prepare school graduates to function in society after completing the educational process (Adamowicz, 2017; Jachimczak et al., 2023).

In the context of changes taking place in our environment, initiatives aimed at improving the situation of school graduates are gaining importance, and the presented publication contains a collection of organizational experiences gathered during the project of systemic implementation of project classes for all primary school students in the city of Wodzisław Śląski in the 2022/23 school year.

2. The project approach in education

In principle, the role of the school is to provide fundamental knowledge, accompany development and build social relations. Conducting education and educating children and young people is carried out in various ways, but it is often a project-based method – consciously or not. Many schools and organizations use the project approach in the didactic process, and over the past 15-20 years, the implementation of project activities by schools has become common. Transferring this education takes place even at the level of preschool or early school age.

The use of the project approach results from many premises (Strojny et al., 2015; De Bono, 2010 or Chojnacki, 2018). These are most often:

- the possibility of developing the teaching staff,
- inviting other entities to implement joint projects,
- own activity of the teaching staff,
- activation of the teaching staff by the school management.

Usually, described educational projects are presented from the point of view of the experiences gained by students or guardians, who are managed by teachers. There are many publications on research in the field of supporting the development of key competences, such as cooperation, critical thinking and time management, e.g. (Okońska-Walkowicz et al., 2009). Those indicate the effectiveness of the project method in developing skills such as planning activities and solving problems. Sysło (2021) emphasizes that Information Technology

education within projects shapes not only technical skills, but also logical thinking and creativity. Gašior M. (2022) analyzes the preparation of students for the labor market, where key competences are essential, while Trzmielewska (2021) describes educational projects implemented as part of volunteering, that strengthen students' social competences. Okońska-Walkowicz A. emphasizes the importance of the project method in developing modern competences. A specific type of project approach in education is the Project Based Learning (PBL) approach, which has been used in Poland in a practical way for over 10 years. Its idea – boiling down to building interdisciplinary teams that find solutions to specific problems - was presented, for example, in (Zdonek, 2017; Karpińska-Musiał, 2018) or (Tykarska, Jarzemińska, 2018). These publications also indicate the interdisciplinary, developmental effects of such an approach to student education.

Another area where we can find publications referring to educational projects is the evaluation and monitoring of the effects of the project approach. W. Wańkiewicz discusses efficiency indicators enabling the results analysis of projects implemented in schools. Lenart (2014) proposes benchmarking as a tool for comparing educational effects in different institutions. Dębowski et al. (2013) in the "Reference Report" analyze the effectiveness of implementing educational standards in Poland in comparison to Europe, and (Hernik et al., 2014) present the results of the TALIS study, which show the state of project management in Polish education.

The implementation of the project approach itself is often an innovation. Marek-Kołodziej (2015) presents an example of implementing an organizational innovation, showing the benefits for schools. Zuziak et al. (2017) describe engineering techniques as a support for project-based learning.

The publications listed above refer to the issue of using the project approach (i.e. interdisciplinary, team approach), most often show direct benefits or the method of operation in individual project teams, at most the implementation of a project solution in a single organizational unit - e.g., a school or university. There are no publications that would concern the systemic model of implementing such a solution in a group of entities. This publication tries to fill this gap by presenting a solution that is of course imperfect, but indicates possible practical application in a systemic way.

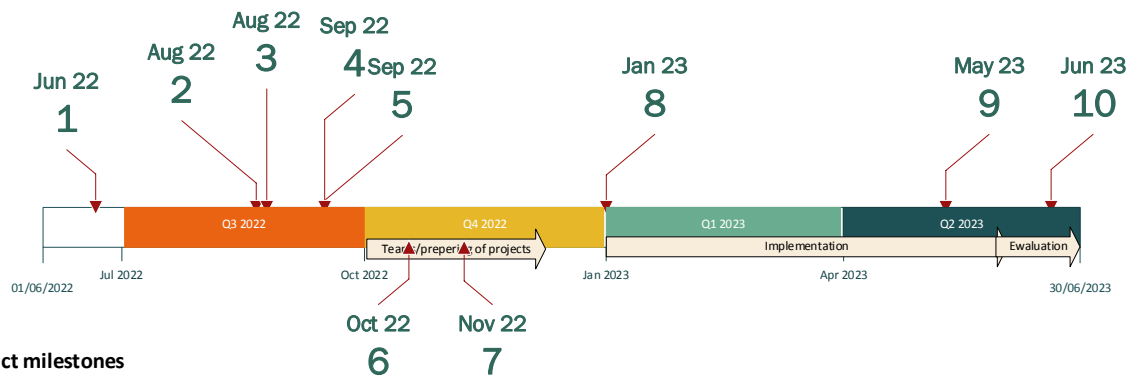
3. Preparation for implementation, developed model

Due to the general demographic trends and changes in the labour market observed by the authorities of the city of Wodzisław Śląski (Hrynkiewicz et al., 2017; Skibiński 2016), a decision was made to introduce classes into the primary school curriculum that would allow their students to learn the principles of a project-based approach to the implementation of problem-solving strategies. This would allow them to acquire the competences necessary in the rapidly changing labor market. This is an action carried out by the local government, whose duty, according to the act, is both to organize education in their own area, but also to inspire didactic activity. The following actions have been taken

1. Workshop initiating the project – meeting of teachers and principals of schools that were to implement the solutions – 6th grades.
2. Preparation for launching project classes began in the first quarter of 2022 with a workshop aimed at developing.

The aim of the project was not to obtain the results of the projects the students carried out in itself, but to increase their practical competences through their participation in project work, a real attempt at teamwork. The primary aim, which was defined by the city authorities, was to supplement the curriculum with elements that give students the opportunity to learn the basic principles and practical way of project teams functioning, which was perceived by the initiators as one of the competences needed and attractive in the future for effective functioning on the labor market.

During the workshops preparing for the implementation of the solution, equal models of implementing project classes in schools were discussed. They resulted from the size of a given school - the number of classes it runs and the number of teachers employed. Due to the awareness of the experimental solution, on the scale of the city and its schools, the variants of the work method between individual schools were finally abandoned and the solution presented in Figure 1 was developed.



Project milestones

June 2022

1 – Information for the Pedagogical Council

August 2022 (after 15)

2 – Workshops – principles of conducting classes, refining the project card template

September 2022

3 – Blocking subjects

4 – Training/workshops for teachers conducting classes

5 – Information for parents

October - November - 2022

6 – Building teams

7 – Preparing workshops – developing project cards (scope, schedule, costs)

January - May 2023

8 – Implementation of project activities

June - 2023

9 – Summary of experiences from the 2022/23 edition (students' presentations)

10 – Evaluation of the assumptions and principles of conducting classes

Figure 1. A model of conducting project classes in the perspective of one school year.

Source: own study.

This solution defined the following framework for implementing the idea of project classes:

1. It was assumed that the first half of the year would be devoted to preparing schools, teachers and parents to implement project classes. In particular, this meant taking the following actions:
 - a. Developing the content of the project card that the student teams would prepare before starting the actual project implementation.
 - b. Blocking subjects, allowing students to work on content common to these subjects, while providing a basis to issuing grades for the results obtained.
 - c. Trainings for teachers, allowing them to equalize their knowledge in the field of conducting classes using the project method.
 - d. Meeting with parents to explain the principles of conducting classes using the project method and drawing attention to the future independent work of the student teams, also outside of school.
 - e. Building 5-6-person student teams that are to carry out projects, so that the work in the team is balanced (and this is, according to the team supervisors, one of the biggest challenges).
 - f. Preparing a list of possible project topics, in case the student teams are unable to find their own.

2. Project classes were carried out in the second half of the school year. In particular, this meant taking the following actions:
 - a. First, student teams were created, they independently proposed topics for the projects they would implement.
 - b. Student teams, with the support of their supervisors, prepared project cards containing the basic parameters of the project (goals, simple work schedule, division of work, necessary aids- stationery or other).
 - c. In the period from January to May, under the team supervision of teachers, students implemented their ideas while preparing for their final presentation, which took place at the turn of May and June.
3. Project team supervisors were given some freedom in setting the start and end dates of individual stages, with the assumption that the final deadline (the turn of May and June – resulting from the end-of-year assessments) must be met.

Team of supervisors - teachers, acting as a kind of leading committee for the implemented project, was indicated on the project card of each student team. The rule was: students work independently - supervisors - lead to solutions. In particular, the support of supervisors referred to help in preparing a work schedule and signaling its expiry.

Even before the implementation, during the preparation of the project, the teaching team agreed that in the case of working with a team that is making a little progress, the topic should be quickly changed to one that the students can handle. In addition, the students were informed that the implementation of the project is an activity for which they will receive grades, and the teachers were to assess the progress of the work by giving partial grades.

4. Experiences from the implementation

To sum up the team's year-long work, descriptive surveys were sent to schools, allowing for an inventory of good and bad practices that appeared during the project. Responses were obtained from 7 out of 13 schools located in the city. Figures 2 to 5 present basic quantitative information on the implementation and results obtained during the implementation of the projects.

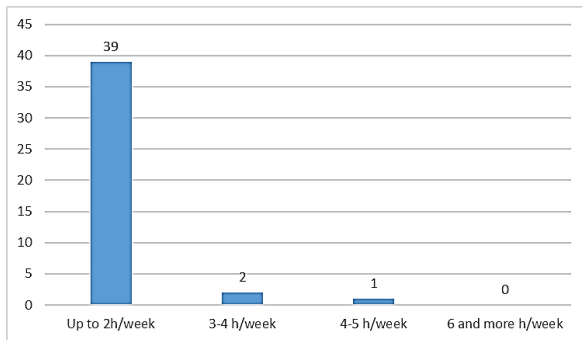


Figure 2. How much time per week was spent on tasks related to project activities per group.

Source: own study.

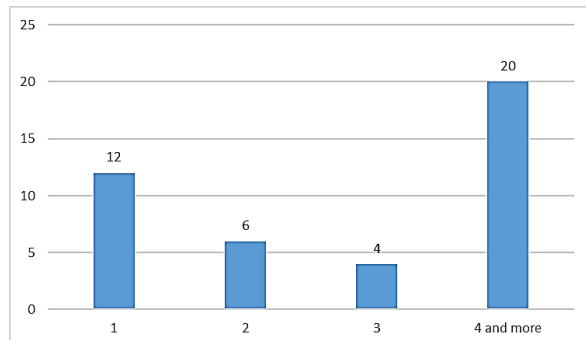


Figure 3. Number of student groups under the supervision of one teacher.

Source: own study.

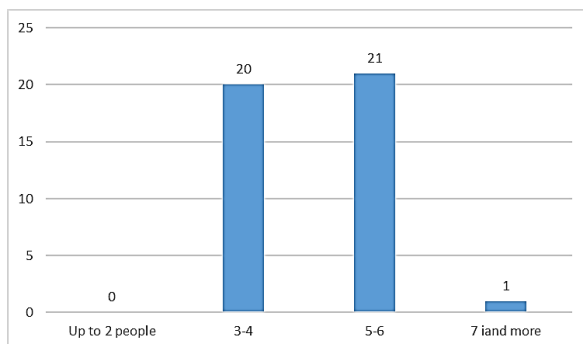


Figure 4. The size of student groups.

Source: own study.

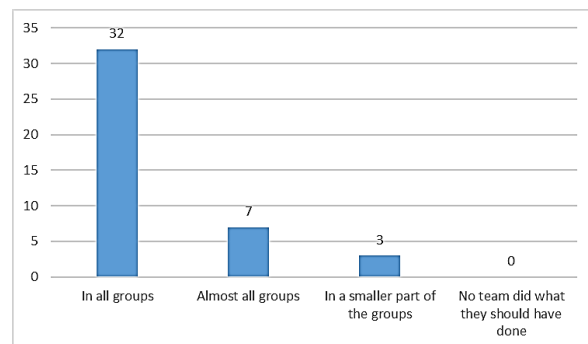


Figure 5. Number of groups in which the project classes ended with the presentation of the results.

Source: own study.

The data presented in the figures show that in most cases the classes were conducted in accordance with the assumptions developed together with the teachers - in most cases the number and size of the student groups that were under the supervision of the teachers did not exceed the number agreed during the preparation of the project. Moreover, in most groups the results obtained can be considered a success of the team's work.

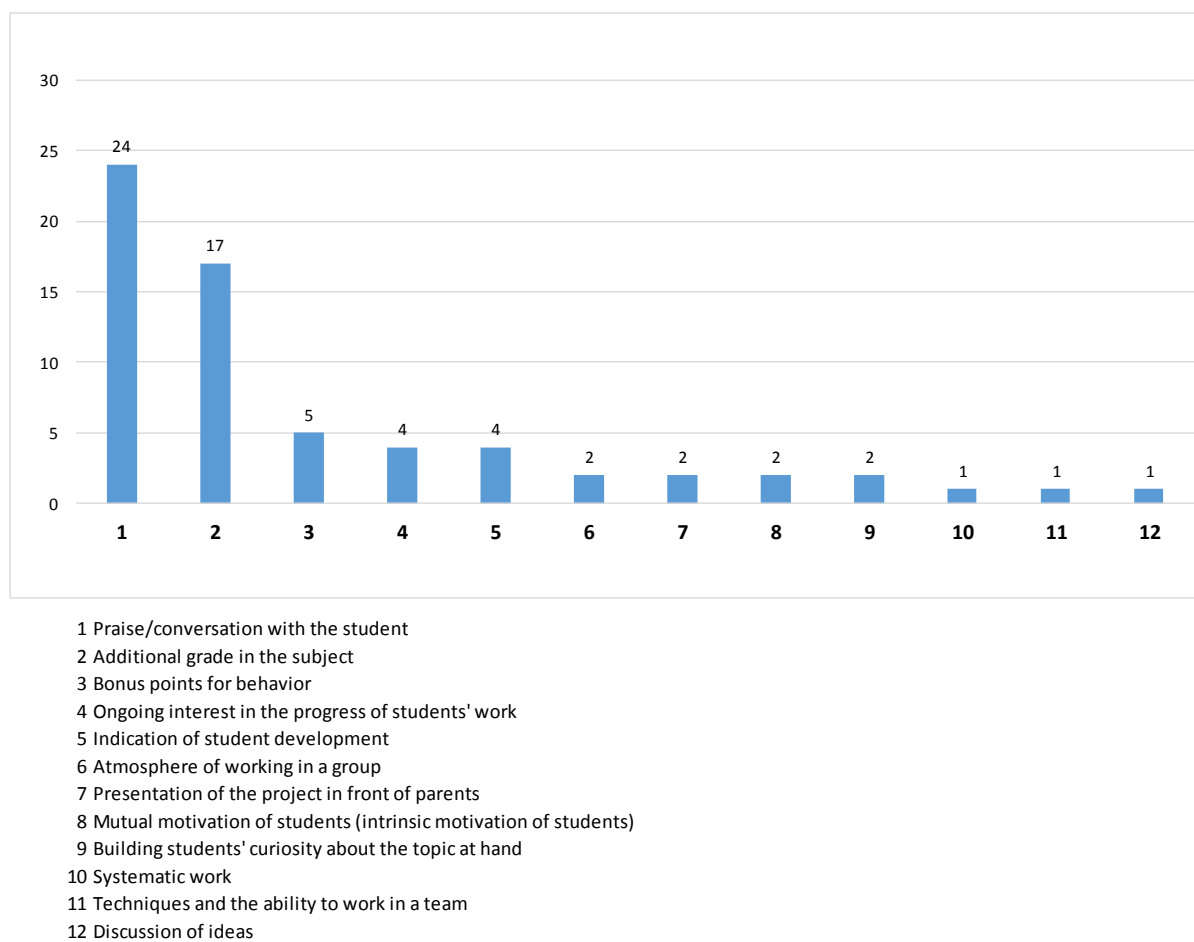


Figure 6 Type of motivation used when working with a team of students.

Source: own study.

Figure 6 presents methods of motivating students to work in project teams. Group supervisors were to indicate the methods used. Of course, the end-of-year assessment is at the forefront, but the method most often used was a conversation with students - praise, which, considering the number of projects that ended in success, may indicate the effectiveness of such a seemingly simple motivational method. At the same time, according to the authors, this emphasizes the need of devoting time to work with students and building a relationship with them that allows such cooperation. Simultaneously, teachers first pay attention to the lack of time as a problem related to the implementation of the project (Fig. 7).

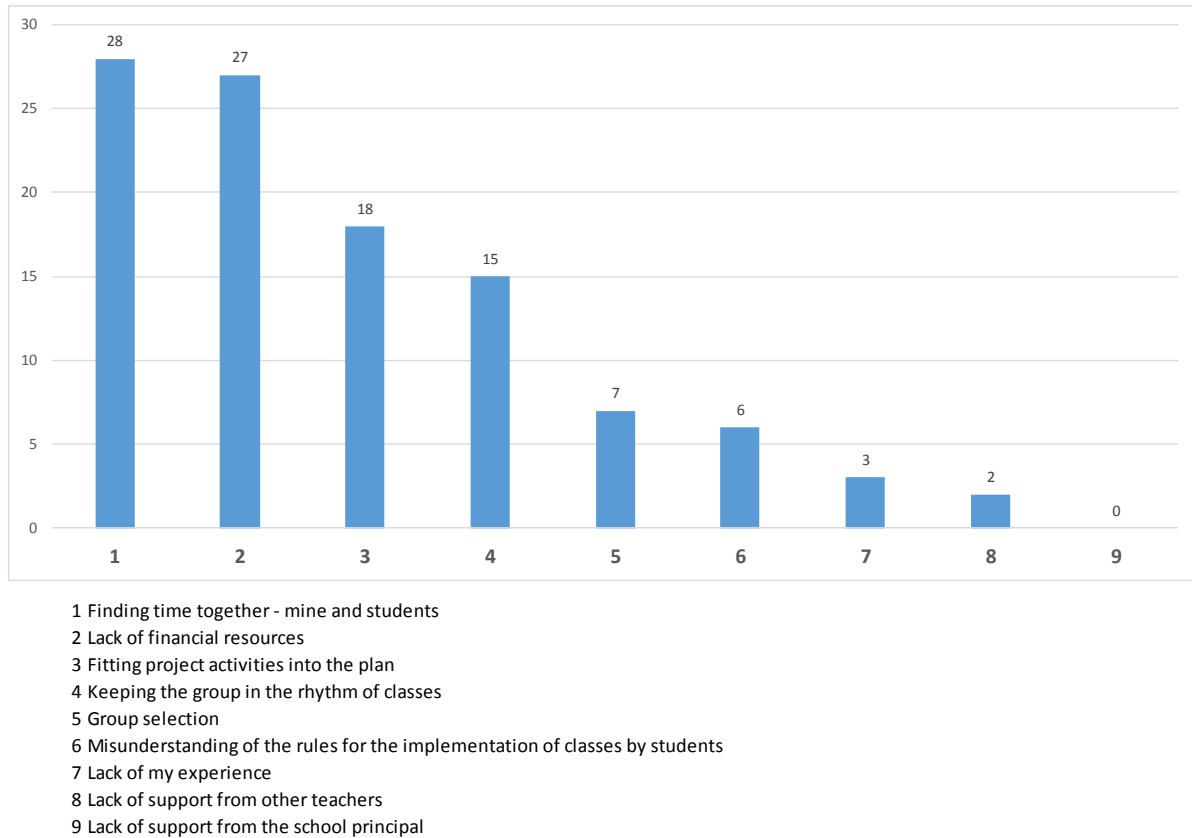


Figure 7. Types of problems during classes with students. Source: own study.

It is also clear that the implementation of student projects is hampered by the lack of budget for the tasks being carried out. Other problems include the appropriate arrangement of classes in the schedule and uneven work of groups. It can therefore be assumed that the key issues are the organization of classes in schools and the ability to work with a group.

Below are the descriptive results of a survey conducted among teachers who implemented project-based classes in the 2022/2023 school year. All statements are presented, and importantly, in some cases they are contradictory, which is most likely due to the different nature of schools or the experience of teachers responsible for implementing the project. The last of the listed comments, “Continue to implement”, is optimistic, as it clearly indicates the good reception and potential of the adopted idea. The responses presented below are almost 100% quotes from the received statements. They have been slightly edited to ensure their consistent grammatical form.

Question: What positive experiences occurred during the project implementation and how to strengthen them – if possible?

- a. Integration of the class group, cooperation between teachers, inter-subject correlation around a specific topic (in our case, getting to know our city), getting to know the history, infrastructure and cultural zones of the city.
- b. The children were eager to cooperate and share their ideas. It would be worth organizing a workshop for teachers working in projects with children.

- c. Developing responsibility and independence in most students and integrating students within the groups formed.
- d. Students develop the ability to work in a group, they become better at creating films/presentations in Canva, group leaders emerge.
- e. Group integration, weaker students can learn more from more capable peers, mutual motivation. Students discover their abilities and skills, gain the approval of their peers, their self-esteem increases.
- f. Group integration, strengthening cooperation among students, broadening knowledge and intellectual horizons, gaining new experiences.
- g. Group integration, student engagement, improving key competences.
- h. The project topic, very well thought out and tested in advance by the teacher. The topic was imposed on the groups from above, but the students had the opportunity to choose the area that interested them the most, modify many aspects of the topic, decide on the form of implementation of individual points. Generally, each group has the same issue to implement. By imposing a topic and listing the most important elements, it is easier for students to organize and plan their work. The possibility of choosing a specific area and the way of implementing the imposed points gave them a sense of decision-making and allowed them to adjust the form of performing the tasks, in accordance with their interests and skills.
- i. The project topic was previously "tested" by the leading teacher on a group of high school students. Therefore, it was easier to anticipate possible problems and modify activities.
- j. Integration of the group, there was cooperation between students.
- k. Strengthening relationships in the classroom, good cooperation between students, parents support throughout the process.

Question: What was/is a barrier to the project implementation, and what measures were used to overcome the barrier/problem? (if it could not be used, please indicate this as well)

- a. Lack of funds and lack of time in the lesson plan (specific hours allocated) for the implementation of the project. Concerns about how the twelve-year-olds will implement what we have planned, fear of the unknown, blocking subjects, difficulties in arranging the lesson plan, uneven pace of work of the project groups.
- b. Students come from different families with different financial status, have different financial resources that they can use to purchase the necessary materials (solution - checking information on the Internet, creating ICT tasks - Kahoot, etc.), some commute to school from outside the district and it is difficult for them to meet at a time other than project classes when combining classes.

- c. Blocking the subjects from the project on one day so that students could complete the project at school turned out to be unrealistic; implementing the project during classes caused difficulties in completing the core curriculum.
- d. The barrier is the small number of lessons with the class, sometimes missed classes (own illness, illness of the children, outings of the whole class or teacher).
- e. There is no additional hour or project classes to complete the project. Classes are held as part of lessons or as substitutes. All necessary materials are financed by parents or the teacher.
- f. Teachers have no experience in conducting long-term projects, poor motivation among children, lack of independence among students in taking actions to complete the project.
- g. Lack of financial resources to implement individual activities.
- h. Failure to take into account the specifics of individual schools.
- i. Organization of time for project implementation. Despite blocking the subjects covered by the project, it is difficult to implement it smoothly and effectively when you have to "sacrifice" lessons and the core curriculum at the same time. The long project implementation time is also a challenge for primary school students. From my experience working with people of this age, the most effective projects are those that do not last longer than 1-2 months. Stretching the work means that students forget what they have already done, are unable to return to their original ideas, come up with too much or too little and are not fully engaged in such long-term activities. The second problem is the total lack of funding, even for stationery needed by children to complete tasks. There is also a lack of funds for salaries for teachers leading the project. In school conditions, access to a computer room, printers and other necessary equipment also proved to be a problem. In order for the project group to be able to work, the other classes had to move their computer science lessons to regular classrooms that day.
- j. Different levels of student involvement.
- k. Time. Possibilities of meetings, providing advice and indicating the direction of activities. Students' lack of skills to work with long-term projects, they are only just learning this style, project work. Hence a number of questions and concerns on the part of students. It was necessary to divide tasks well, set precise deadlines, constantly monitor whether the work was progressing and the activities were carried out by students in the appropriate scope and according to the arrangements.
- l. Lack of financial resources. Students used their own resources.

Question: What comments do you have on the organization of the project?

- a. A systemic solution would be additional lesson hour(s) allocated to the implementation of the project (grade VI).
- b. The project method itself is a method that has many advantages. Students learn to work independently and solve problems creatively. However, I do not like the form of combining subjects. In the sixth grade, it is difficult to bring students' invented topics

into line with the core curriculum at this level of education, and it is even more difficult to combine three or more core topics from different subjects - sometimes completely unrelated. Projects should be based on either humanities or science topics. Students could choose from a range of proposed topics, which teachers would prepare in advance in subject teams - of course, the topic could be modified in consultation with the students.

- c. In the future, leave the possibility of formulating topics to teachers - students can decide on a topic that interests them; implement a project within a group of related subjects (humanities, mathematics and science).
- d. It is difficult for students to meet outside of school, most participate in various additional extracurricular activities (outside of school). An additional hour per week in the schedule, intended only for project work would be very useful.
- e. Maybe in the future volunteers can be recruited to implement the project, not the entire class.
- f. Lack of funds for organizing project plans, e.g. culinary products, financing scheduled trips.
- g. Lack of common principles for implementing the project for all schools.
- h. The project was not entirely thought through (maybe it was introduced too quickly), mainly in practical and organizational terms.
- i. The final effect was very satisfactory, the students had the opportunity to present the results of their work to the whole school and to their parents. Topic: Silesia and neighboring regions. The students presented voivodeships in numbers, interesting facts, important information, they did not even forget about regional costumes and traditional dishes. The coats of arms of the provinces and local music were also made. Visible were different points of view and various ideas on how to present their province. I consider the whole thing a very successful undertaking.
- j. No additional hours allocated for the implementation of the project.

Question: What areas/project elements should be improved and how?

- a. First of all, we should allocate specific hours for the implementation of the project, assign a certain amount of money for it, so that parents do not complain that they are supporting schools in the city (see LP). In grades 1-5 children should be taught to work in groups, so that in grade 6 there will be no issues with this in project classes.
- b. The project should be a separate subject for the class, written into the class plan (teacher gets compensation for the hour); financial resources for each school to implement the projects: necessary materials; apart from that, my opinion was presented in the point above.
- c. Allocate additional hours for the implementation of the project, e.g. from principal's hours.
- d. Providing funds for the implementation of projects.

- e. Preparation of the project - lack of financial resources for materials needed to implement the activities. Financing the activities of supervisors and coordinator.
- f. Financing - funds to be used in the implementation of the project as well as salaries for teachers. Organization of project classes for students, shortening the time of work on the project. More intensive work, but in a shorter time (e.g. project month).
- g. Planning division into project groups.

Any other comments/conclusions on the course of the project?

- a. We need to consider whether in times of crisis and financial constraints we can afford to implement all strategic tasks. I am sure that every person living in Poland will understand the lack of finances and failure to implement strategic tasks, especially in such an unfashionable area as education is lately.
- b. Additional funds for materials needed to implement the project.
- c. Providing at the beginning of the task the amount of funds that the project group has at its disposal to implement the project.
- d. Continue to implement.

5. Discussion of the model and summary of experiences

The first edition of project classes in schools brought a number of experiences gathered during work with students. The general model of classes, dividing the work in the school year into a period of preparing teams and topics, and then a period of implementation, proved effective. Teams used the prepared Card to plan their own activities, and then executed them.

The issues that required modification were primarily elements related to the organization of teachers' work - it was not always easy to find time for them to work together with students, especially in situations where they worked in two schools. Another challenge was to define the work topics of student teams so that they could implement elements of the curriculum appropriate for the subjects in which the project was conducted.

Finances, as usual, remain a separate issue. The project was implemented without a dedicated budget for student projects, which required tasks to be implemented based on non-financial resources, such as a bus provided by the city, access to the city's educational center, materials owned by schools or financed by parent councils. For the further development of the project, it is necessary to consider the financial resources needed to implement subsequent topics. This is not about large amounts - during the work, the budget of a single team was estimated at PLN 500 to, in rare cases, PLN 2000.

It should be emphasized that despite initial objections, the majority of the team implementing classes according to this model assessed it positively, indicating the possibility of using it in the future.

References

1. Ustawa z dnia 16.12.2016 Prawo Oświatowe, Dz.U. 2017 poz. 59 [Act of 16 December 2016 Education Law, Journal of Laws 2017, item 59].
2. Adamowicz, M., Skarżyńska, P. (2017): Rola samorządu lokalnego w realizacji zadań oświatowych na przykładzie samorządu gminy Szelków [The role of local government in implementing educational tasks on the example of the local government of the Szelków commune]. *Annales Universitas Marie Curie-Skłodowska*, vol. XXIV. Lublin.
3. Chojnacki, W. (2018): Zastosowanie podejścia projektowego do analizy zawodów na peryferyjnym rynku pracy [Applying a project approach to the analysis of professions in the peripheral labor market]. *ZN Organizacja i Zarządzanie*, no. 115. Wydawnictwo Politechniki Śląskiej.
4. De Bono, E. (2010): *Dziecko w szkole kreatywnego myślenia [A child in the school of creative thinking]*. Helion.
5. Dębowski, H., Chłoń-Domińczak, A., Sławiński, S. (2013). *Raport Referencyjny. Odniesienie Polskiej Ramy Kwalifikacji do Europejskiej Ramy Kwalifikacji. Raport Ministerstwa Edukacji Narodowej [Referencing Report. Referencing the Polish Qualifications Framework to the European Qualifications Framework; Report of the Ministry of National Education]*.
6. Gąsior, M., Sak-Skowron, M. (2022). *Kompetencje pracowników w perspektywie rynku pracy i procesów kształcenia [Employee competencies in the perspective of the labor market and educational processes]*. Politechnika Lubelska.
7. Hernik, K., Malinowska, K. (2014). *Polscy nauczyciele i dyrektorzy w Międzynarodowym Badaniu Nauczania i Uczenia się [Polish Teachers and Principals in the International Study of Teaching and Learning]*. TALIS 2013; Raport OECD TALIS.
8. Hryniewicz, J., Potrykowska, A. (2017). *Sytuacja demograficzna województwa śląskiego jako wyzwanie dla polityki społecznej i gospodarczej Rządowa Rada Ludnościowa [The demographic situation of the Silesian Voivodeship as a challenge for social and economic policy], Tom IX*. Warszawa.
9. Jachimczak, B., Podgórska-Jachnik, D. (2023): *Edukacja włączająca w perspektywie i zadaniach samorządu terytorialnego [Inclusive education in the perspective and tasks of local government]*. Wydawnictwo Uniwersytetu Łódzkiego.
10. Karpińska-Musiał, B. (2018). Międzywydziałowy semestr PBL (Problem-Based Learning)–innowacyjna praktyka dydaktyczna w ramach projektu Centrum Tutorów Uniwersytetu Gdańskiego [Inter-faculty semester PBL (Problem-Based Learning) – innovative teaching practice as part of the project of the Tutors' Centre of the University of Gdańsk]. *Tutoring Gedanensis*, no. 3.

11. Lenart, R. (2014): *Benchmarking w zarządzaniu placówką szkolną [Benchmarking in school management]*. Warszawa: Difin.
12. Marek-Kołodziej, K. (2015). *Wdrożenie innowacji organizacyjnej poprzez projekt – studium przypadku [Implementation of organizational innovation through project – a case study]*. TRANS-fair.
13. Okońska-Walkowicz, A., Plebańska, M., Szaleniec, H. (2009). *O kompetencjach kluczowych, e-learningu i metodzie projektów [About key competences, e-learning and the project method]*. WSiP.
14. Skibiński, A. (2016). Uwarunkowania demograficzne rynku pracy na obszarze województwa śląskiego – wybrane aspekty [Demographic conditions of the labor market in the Silesian Voivodeship – selected aspects]. *Studia Ekonomiczne, Zeszyty Naukowe Śląskiego Uniwersytetu Ekonomicznego, no. 258*. Katowice.
15. Strojny, J, Szmigiel, K. (2015). Analiza porównawcza podejść w zakresie zarządzania projektami [Comparative analysis of project management approaches]. *Modern Management Review*.
16. Sysło, M.M. (2021). Od Elementów Informatyki po Informatykę dla wszystkich uczniów [From Elements of Computer Science to Computer Science for All Students]. *W Cyfrowej Szkole, no. 3*. Ośrodek Edukacji Informatycznej i Zastosowań Komputerów.
17. Trzmielewska, K. (2019). Program Projektor - wolontariat studencki przestrzenią do realizacji autorskich projektów edukacyjnych [Projektor - student volunteering program as a space for implementing original educational projects]. *Ogrody Nauk i Sztuk, no. 9*. Wydawnictwo Uniwersytetu Wrocławskiego.
18. Tykarska, M., Jarzemińska, B. (2018). Projekt edukacyjny prowadzony metodą Problem-Based Learning „ZATOKA – chrońmy przyrodę i rozwijajmy turystykę [Educational project conducted using the Problem-Based Learning method “ZATOKA – let’s protect the nature and develop tourism”]. *Tutoring Gedanensis, no. 3*.
19. Zdonek, I. (2017). Wykorzystanie Project-Based Learning w edukacji klasy kreatywnej [Using Project-Based Learning in the Education of the Creative Class]. *ZN Organizacja i Zarządzanie, no. 102*. Wydawnictwo Politechniki Śląskiej.
20. Zuziak, W., Smyrnova-Trybulska, E. (2017): Podejście inżynierskie w nauczaniu [Engineering approach in teaching]. *Zeszyty Naukowe Wydziału Elektrotechniki i Automatyki Politechniki Gdańskiej, No. 52*.

Attachment 1 – template of the project card prepared by students with the support of their supervisors

Wodzisław Śląski, date

Project Card

1. Project topic:

2. Project team

First name and last name	Class

3. Team leader:

4. A team of supervisors with the coordinator

5. Team work rules 1/week, full week, etc. – and what cooperation with supervisory teachers should look like

6. Why this topic:

7. Method of presenting the results:

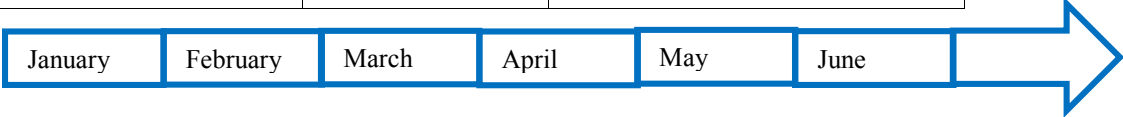
8. Methods of implementing the ideas for achieving the results listed in point 7:

9. What problems may occur during the implementation of the project?

Model of project classes...

10. Main tasks to be completed (presentation, trip, leaflet)

Project task	Task leader	Implementation period



11. Other information about the project:

12. Materials and tools needed to complete the project

Type	Quantity

Team leader and the team (signature)

Appendix 2 – list of topics proposed before implementation and selected topics that were implemented in the full cycle.

Proposed topics¹

1. Travel educates. Plan a 5-day trip to a European country of your choice.
2. The world seen through a camera lens.
3. Silesia full of charming spots.
4. In the footsteps of our school graduates?
5. Polish regional dishes.
6. Our Silesian traditions - a guide.
7. In the footsteps of Fryderyk Chopin.
8. What installations are hidden in our houses?
9. Is Wodzisław Śląski an attractive city?
10. Extraordinary residents of Wodzisław Śląski.
11. Tourist attractions of the world's largest islands.
12. Flavors of Italy.
13. My school - my place.
14. My dream kitchen.
15. The history of Wodzisław through the history of ordinary people.
16. „Komu w drogę, temu...” [Time to hit the road]
17. „Taniec łagodzi obyczaje?” [Dance softens manners]
18. The fascinating world of reptiles.
19. „Jeż zdrobniale, który lata doskonale” [The common swift]
20. Seasons - nature changes the landscape.
21. A journey to our Solar System.
22. What do we know about Poland's neighbors?
23. My region - my small homeland.
24. Every country has its customs.
25. “WITAJ MAJOWA JUTRZENKO...” - celebrations of the Constitution Day on May 3.
26. Silesia and neighboring voivodeships.
27. „Wszędzie dobrze, ale...” [There's no place like home]
28. In the footsteps of regional poets.
29. Do you know your roots?
30. The daily life of an athlete.
31. Following the lives of forest creatures.

¹ The equivalents of specific Polish sentences/proverbs are presented in brackets.