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Appropriateness of Project-Based Learning- Students' Perspective

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Abstract. This paper investigates students' perceptions of Project-Based Learning (PBL) as a teaching approach and its implementation in classroom settings. As an active, student-centred teaching approach, PBL instruction emphasizes learner engagement, autonomy, and real-world application of knowledge. This method might be an appropriate option in today's school background as it places the student and their interests in the centre and encourages them to actively participate in the learning process. The study examines how students experience and evaluate PBL in terms of motivation, participation, and the development of essential competences such as critical thinking, problem-solving, collaboration, and communication. We analyse in this article students' perceptions of PBL usage in the classroom and the extent to which this teaching approach might be an appropriate solution to the challenges that students have to face due to the continuous technological, economic and societal changes, among other active learning approaches. The results provide insight into how PBL can enhance students' motivation to learn and develop collaboration and competences which better prepare students for future academic and professional demands.

Keywords. collaboration, motivation, project-based learning, students' choice.

A. INTRODUCTION

Project-based Learning or PBL, as we will use it in this paper is a teaching strategy which places the students at the centre of the learning process. The literature associates PBL with the progressive education movement in the USA at the end of the 19th century when William Heard Kilpatrick used the term 'Project' for the first time in his essay in 1918 entitled 'The Project Method'. The project method, however, is different from other projects, in which students make use of the knowledge they possess and apply it in order to create a project. PBL does not rely on the knowledge that has to be put into practice, but on the construction of knowledge starting from a problem that has to be solved which challenges the students to develop also other skills.

According to constructivism, which is a theory concerning learning and knowledge, learners construct their own knowledge in an active way based on their interaction with the world, their practical experiences while putting effort to give meaning to those experiences. During PBL students construct knowledge by means of active experiences and learning by ‘trial and error’ (Frank, Lavi & Elata, 2003). Consequently, constructivist teachers want their students to take responsibility for their own learning and in this way, students become autonomous thinkers, and develop integrated understandings of concepts and seek to find answers to important questions.

As a result, the teacher-students relationship changes with the teacher moving a step backwards and allowing the students to conduct the process. Even though PBL is an approach to learning which is student-driven, it is teacher-facilitated (Bell, 2010). Students are guided through the whole learning process and they are constantly under the teacher’s supervision who provides feedback, assesses progress, creates opportunities for research, moderates process, ‘scaffold the instruction by breaking down tasks’ (Blumenfeld, 1991, p. 371). Students gain new information by asking questions that have sparked their interest and curiosity. They design the whole learning process, they organize all the activities, conduct research, and eventually solve the real-world problems and present the solutions to a wider audience. Consequently, PBL enables students to learn from the best teacher, namely, the student himself. To conclude, we can assume that the role of the student shifts from ‘recipient of information’ to ‘maker of meaning’ as they design, plan, take decisions, verify hypotheses, carry out activities such as interviews, role-play, case study, assume roles during the project (Fleming, 2000, p. 8).

Stoller argues that teachers have to help students develop collaborative skills, such as negotiation, active listening, respect for others’ opinions because students naturally do not collaborate with their peers, unless they have some experience in group work. In this way, not only do students gain new knowledge regarding the analysed topic, but they also acquire or develop skills which will help them in the future (2006, apud Krajcik & Shinn, 2014). We consider that it is the purpose of education to help students learn how to transfer skills. Ulrich-Hygun points out that the goal is not to answer the teacher’s questions but ‘to understand phenomena and the underlying processes as well as the evolution of certain things’ (2016, p.209). Harmer & Stokes (2014) in a literature review have revealed that if learners are passive recipients of information, they may recognise or reproduce what they have learned, but they will not be able to transfer and apply it in a real-world situation.

B. METHOD

To provide a comprehensive overview of the study’s structure, we have summarized the key components of research methodology aligned with the research objective as presented in Table 1.

Table 1. A structured representation of the methodological framework

<i>Objectives</i>	<i>Research design</i>	<i>Instrument</i>	<i>PBL Intervention</i>	<i>Methods</i>	<i>Data</i>	<i>Population</i>
General Objective	Exploratory	PBL-SPQ	Post intervention	Mixed methods	Quantitative and qualitative	38 experimental group

The methods used to collect and interpret data for this study are mixed methods. Through mixed methods we intended to gather data that would provide insight into the effectiveness of PBL as an alternative strategy to teaching. The qualitative data from open questions in the PBL-

SPQ questionnaire were analysed thematically, identifying key patterns and perspectives that reflect students' perceptions of PBL as a learning strategy.

Participants

The present study, which is an integral part of a larger study in which the cohort consisted of 78 students (38 students assigned to the experimental group and 40 to the control group), involved only the students who belonged to the experimental group (N=38, 7 boys and 31 girls). The experimental group comprised students from two classes in the 10th grade: 24 from the humanities profile and 14 from the science profile. The optimal size of the sample has been statistically determined by the power analysis using GPower 3.1. For the proposed design with 2 groups, an alpha level or the level of significance set at 0.05, the optimal level of power analysis, 68 participants would be required, 34 participants in each group.

Design

This study proposes an exploratory design, to gain a deeper understanding of students' subjective experiences with PBL, focusing on how they interpret and react to this instructional method. The exploratory design adopted in this study aligns with the study general objective: to examine students' perceptions regarding the usage of PBL in the classroom.

Instrument and Procedure

The instrument that we used was *Project-Based Learning Student Perception Questionnaire (PBL-SPQ)* which was designed by the researcher exclusively for the purposes of this study, aiming to collect data on students' perceptions of the project activities, the elements they considered significant in the implementation of Project-Based Learning (PBL), and their motivation to engage in learning through this approach.

The questionnaire was administered after the intervention, which involved a project that students carried out over the course of three school weeks, in the presence of the researcher. It was completed during the researcher's English class, after the intervention. The questionnaire consisted of 16 items, including 12 closed-ended and 4 open-ended questions and it was a 20 minute- pen & paper questionnaire.

C. RESULTS

The variable of this research is PBL, as the independent variable. The means and standard deviations for the experimental condition post- intervention are reported in Table 2.

Table 2. Descriptive statistical data for the experimental condition

Variables	Experimental group		Control group	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Item1_Project	4.00	1.14	-	-
Item2_Project	4.74	3.13		
Item3_Project	4.40	.79		
Item4_Project	3.71	1.14		
Item5_Project	3.82	1.29		
Item6_Project	4.08	.85		
Item7_Project_Total	29.08	8.39		
Item7A_Project	4.32	.93		
Item7B_Project	3.37	1.24		
Item7C_Project	3.58	1.35		
Item7D_Project	3.00	1.43		
Item7E_Project	3.00	1.38		

Item7F_Project	3.55	1.25
Item7G_Project	4.16	1.24
Item7H_Project	4.11	1.27
Item8_Project_Total	8.79	1.44
Item8A_Project	1.61	.50
Item8B_Project	1.74	.45
Item8C_Project	1.90	.31
Item8D_Project	1.84	.37
Item8E_Project	1.71	.46
Item10_Project	1.66	.75

The items in the questionnaire were categorized thematically and organized according to their respective categories, as shown in Table 3.

Table 3. Analysis of item category distribution and corresponding items in the questionnaire

No. of category	Item category	No. of Item
1.	Choice of topic	3, 4, 5, 6, 8d
2.	Collaboration	7a-7h
3.	Motivation	2, 8b, 8c, 8e
4.	Competences	9
5.	Usefulness of PBL	10, 11, 12
6.	Project Experience	1, 13, 14, 15

The results will be presented based on the thematic categories of the questionnaire items:

1. Choice of topic

Regarding the importance of choosing the topic for the project themselves, 55,3 % (21 students) considered that freedom of choice was very important and 31,6% (12 students) thought that was important. Consequently, a vast majority, 86.9% considered choosing the topic themselves of importance for their involvement in the project. Only 1 student considered freedom of choice of little importance.

Even though the topic was the students' choice, not all of them considered the topic of high relevance to them. The majority, 60,5% (23 students) considered that the topic was very much and a lot relevant to them. 6,4% (5 students) said that the topic had very little and little relevance to them. 26.3% considered the topic had moderate relevance to them.

However, a vast majority of students 73,6% (28 students) considered that the topic they had chosen had much and very much relevance to students of their age (highschool students). 23,7% (9 students) considered the topic of moderate relevance to highschool students. We assume that students may recognize societal or generational importance of the topic, even if it doesn't align directly with their interests or personal experiences. We consider that students are capable of evaluating what issues are significant to their age group or community. It is interesting that students can separate personal interests from social problems that need to be treated.

The majority of students, 65,8% (25 students) were much and very much motivated to get involved in the project as a result of the fact that the topic of the project was their own choice. 21% were moderately motivated to involve and 10,5% were very little motivated.

2. Collaboration

Regarding collaboration with peers, students' answers reveal that 86,8% (33 students) considered it important and very important for the development of the project. Less than 5%

considered it unimportant. Students had to work in groups and collaborate in order to perform all the activities of the project.

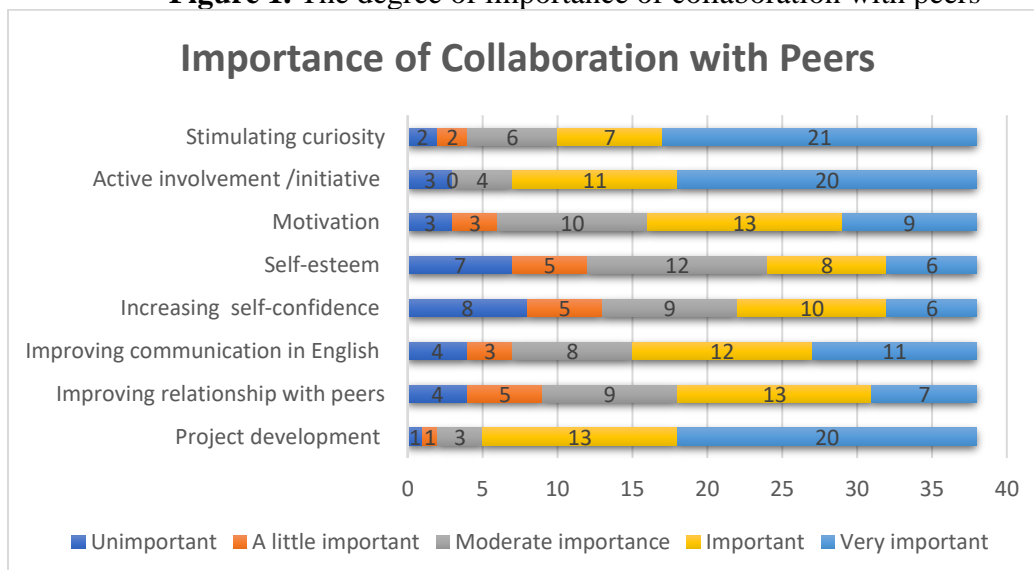
However, collaboration was not that important for improving relationships with peers. Only 18.40% consider it very important in relationship improvement, 34.20% consider it important whereas 47 % consider it either of very little or moderate importance. One explanation could be the fact that the study involved two distinct classroom groups: one consisting of 14 students following a science profile, and another with 24 students enrolled in a humanities profile. The latter, composed of 22 girls and 2 boys, often faced difficulties in achieving group cohesion. Interpersonal conflicts were frequent, and students regularly experienced disagreements and emotional strain. So, we thought it would be important to look at data separately, for the two profiles for this particular question.

The findings reflect the prevailing socio-emotional dynamics within the classroom environment. Within the humanities group, 70% perceived collaboration as important or very important for enhancing relationships with peers. Therefore, we could assume that the collaborative project was therefore seen as a valuable opportunity for them to demonstrate that they were capable of working together harmoniously toward a shared objective. In contrast, only 14% of students in the science group believed that collaboration played a significant role in improving peer relationships. The reason behind the data could be that there are already strong relationships between the students in that class and consequently, they might not see collaboration as something that builds relationships, as they may already feel connected and just see group work as a task. Besides, both groups were product-focused and they viewed collaboration as a means to complete the task, not as a social tool.

Collaboration with peers helped students improve their communication in English a lot as the majority responded (60.5%). Similarly, collaboration was important in increasing students' motivation to work in the project at a high degree as it was reported by the majority of students (57.9%).

However, students did not find collaboration so much important for their self-esteem and self-confidence. More than 50% of students considered collaboration of no importance or moderate importance. Notably, collaboration was highly important in stimulating students' curiosity to find out more about the chosen topic as reported by 81.5% of students. Similarly, 73.7% of students considered it of great importance for students' initiative and active involvement in the project activities, as it is presented in Figure 1.

Figure 1. The degree of importance of collaboration with peers

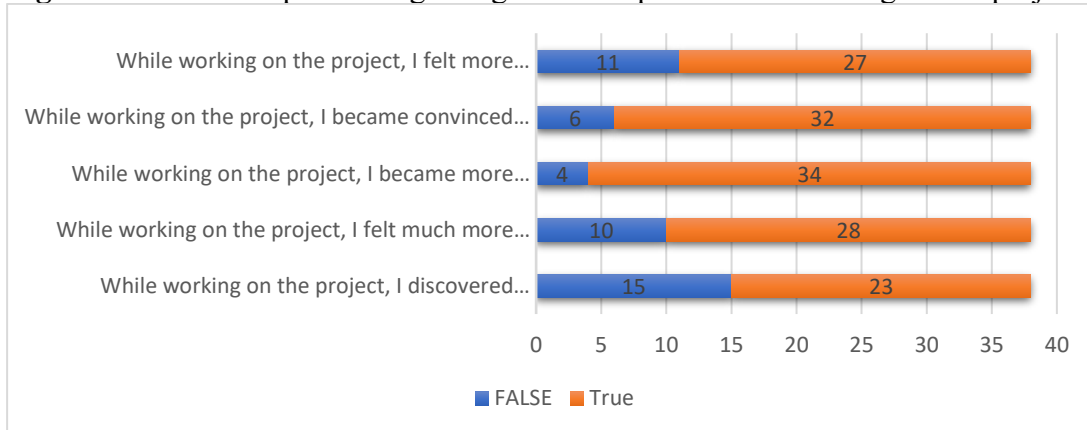


3. Motivation

Even though not many students were initially convinced of the relevance of the topic they have chosen while working in the project, they became more convinced of its relevance as the majority stated (71.1%) as it is presented in Figure 2. Moreover, a vast majority (89.5%) stated that they became more curious about the topic while working on it. We consider that this shift in perception and increased motivation can be explained through the hands-on, inquiry-based nature of PBL as students may not grasp a topic's relevance until they engage deeply with it. Curiosity is often sparked by inquiry and exploration and the project may have led students to ask more questions and seek out new information, thus reinforcing the topic's perceived importance and stimulating intrinsic motivation.

At the same time, 71.1% of students considered that they were more motivated to improve their English communication skills. The same number of students felt much more confident in their English language skills (73.7%). A smaller percentage (60.5%) considered that while working on the project they discovered qualities in their peers that they were unaware of.

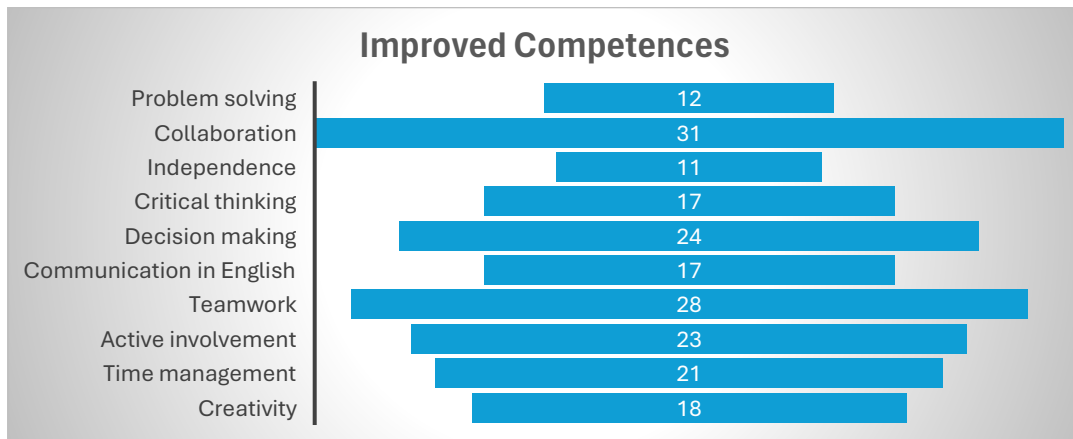
Figure 2. Students' opinions regarding certain aspects while working on the project



4. Competences

Students considered that they improved many competences while working on the project. The majority (81.5%) considered that they have improved their cooperation skills, as the majority of the activities of the project involved groupwork and collaboration between peers. At the same time, many students (73.6%) considered that teamwork skill has improved. While collaborating, they were actively involved in the activities (60.5%), solving problems (31.5%) and managing their time according to schedule (55.2%). More than half of students, 63.1%, considered that their decision-making competence improved. Less than half of students (47.3%) think that their creativity has developed more due to projects as well as their communication in English, as they searched for their materials in English. The least improved competence is believed to be independence, with only 28.9% of students admitting that due to the fact they collaborated, worked in groups, and only rarely did their research individually, as it is reflected in Figure 3.

Figure 3. Students' opinions regarding the improvement of competences



5. Usefulness of PBL

The questionnaire contained four open questions. The first question asked students to provide reasons for the usefulness of PBL usage in class by teachers. 43,2% (16 students) considered that it would be very useful if teachers used PBL in class. However, the majority, 51.3% (19 students) considered that usage would be useful under certain conditions. Only 2 students (5,4%) thought it would be of little use.

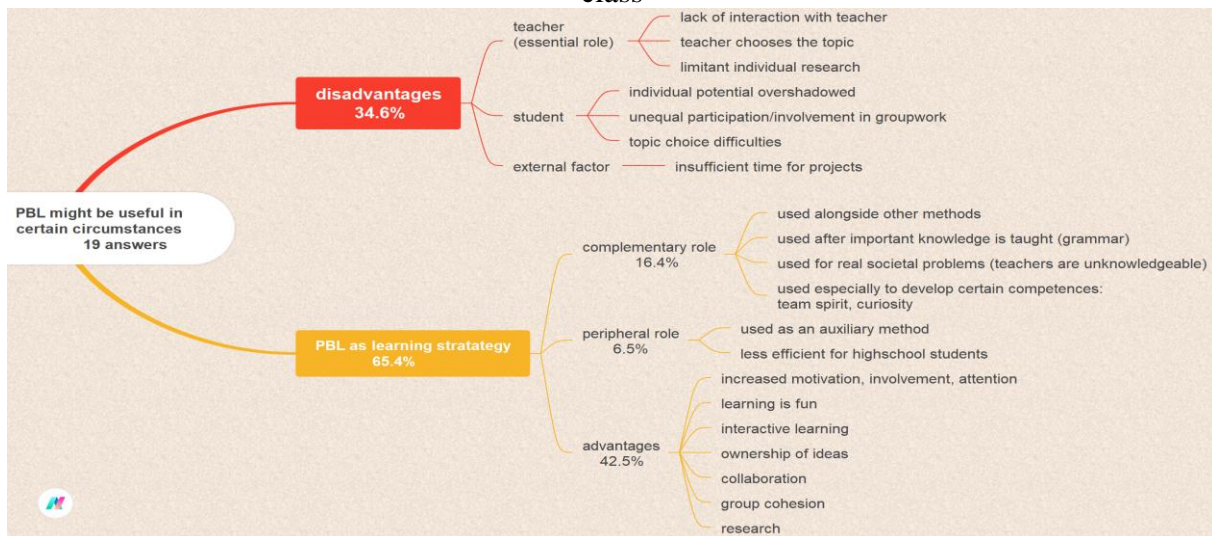
Students identified various reasons for considering PBL highly beneficial in the classroom, which were categorized into three main areas: **personal development**, subdivided into the development of competencies and motivational factors, **social aspects**, and the **nature of the learning process**. Their answers included the development of key competencies such as time management, communication, collaboration, autonomy, and essential 21st-century skills. Additionally, 23% of students emphasized the value of having the freedom to choose topics and make decisions during the learning process. One student responded: ' *It is imperative for the sustainable development of students to be placed in non-formal responsibility contexts within the educational process, as this allows them to develop the skills necessary for adapting to today's job market* '.

Additionally, 23% of students reported increased motivation, higher levels of engagement, and improved attention during lessons, factors that were categorized under motivational constructs within the broader theme of personal development. They consider that choice may lead to motivation, and more involvement. One student says: ' *Students would be much more engaged and motivated if they chose their own project topic, as it helps break the monotony and routine, which can eventually lead to a loss of attention* '. 30% of students cited social reasons such as team spirit, group cohesion, and peer interaction which were categorized under the social dimension, a particularly significant aspect at this stage of their development. One student says: ' *It united us as a class and helped us develop certain skills and better understand the chosen topic* '.

Additional reasons were grouped based on students' descriptions of the type of learning experienced through PBL. Specifically, 24% of students indicated that PBL makes learning enjoyable, promotes learning through cooperation and interaction, enhances their understanding of the subject matter, and fosters originality and creative thinking.

However, the majority of students, 51.3% considered **the usefulness of this teaching tool under certain conditions**, as Figure 4 shows. The reasons they provided have been grouped in two categories, disadvantages (34.6% of students) and PBL as a learning strategy (65.4%).

Figure 4. Students' opinions regarding reasons why PBL would be a useful tool to be used in class



The disadvantages referred to the essential role of the teacher (13.5%), who should choose the topic and have constant interactions with the students, especially when the topic is very complex, the students (13.5%), who might be either overshadowed in a group or unequal participation or involvement in the set tasks and external factors (7.6%), such as lack of time for projects. The learning strategy comprised advantages (42.5%), PBL-complementary role (16.4%) and PBL-peripheral role (6.5%).

According to 6.5% of students' opinions, PBL as a learning strategy has a peripheral role, as it is less efficient for high school students as well as a complementary role (16.4%). Students consider that it should be used alongside other methods, especially to develop certain skills or to solve real societal issues according to one student who said: '*it (PBL) would be useful in cases where students need to face the real issues of society, but not in situations where the teacher knows exactly what to explain*'. We can assume that students consider this method relevant in connection with the development of certain skills, for example, related to citizenship education which are not acquired normally during classes. In our case, during the English class students focused on a problem which affects youngsters (drugs or pink tax) which is not taught specifically in the curriculum.

42.5% of students mention certain advantages such as increased motivation and involvement, greater attention, group cohesion, fun and interactive way of learning. One student mentions: '*It strengthens relationships between colleagues and becomes a motivating factor because the project topic belongs to us*', and another student says: '*It engages students and motivates them toward research and collaboration*'.

We can assume from students' perceptions regarding PBL that it can be broadly effective if some requirements are met:

- The role of the teacher is crucial. Without expert scaffolding, projects could be overwhelming or directionless.
- Equitable groupwork. The social dynamics such as unequal contribution or dominant personalities in the group can reduce the effectiveness of PBL. We suggest that students be familiarised with collaborative groupwork for effective implementation of PBL.

- A hybrid instructional approach. PBL should be used selectively alongside more traditional methods to enhance learning in specific areas, to develop real-world competences and civic engagement.

6. Project Experience

This section of results explores students' reflections on their involvement in the project, focusing on what they enjoyed most, as well as the satisfactions and frustrations they experienced. 76,3% (29 students) enjoyed working on the project much and very much. Only 3 students (7,9%) enjoyed very little the experience of projects, and 15,8% (6 students) enjoyed moderately working in the project. Students' answers regarding satisfaction with project work were coded and eventually 3 themes emerged: social satisfactions (19 students), personal satisfactions (11 students) and academic satisfactions (18 students)

Social satisfaction

In terms of social satisfaction, 19 students responded that their satisfactions are related to enjoying working with peers to accomplish the task, the final product that was presented to an audience (4 students), collaborating with peers (5 students), having meaningful connections (4 students), discovering colleagues in a different way (1 student) or collaboration with students they haven't worked before (1 student).

Academic satisfaction

Regarding academic satisfactions, 18 students mentioned either improving knowledge or developing skills. 50 % of them claimed that they were satisfied that they had learned new things, or they had improved their knowledge or transfer the knowledge from other subjects. From students' emphasis on 'learning new things', we can assume that the standard curriculum may not provide enough opportunities for exploratory or experiential learning. By contrast, it implies that PBL offers a more meaningful context for learning, which enhances retention and understanding. Students' appreciation for interdisciplinary learning and knowledge transfer indicates that the current curriculum might lack integration across subjects. When students feel they are learning more or in different ways during a project, it may point to a gap between what is taught and what students find relevant, current, or engaging. We consider that PBL's real-world approach may bridge this gap more effectively than traditional instruction. One student said that he learned something new in a fun, pleasant way. 40% of students responded that they had developed new skills, such as: communication, cooperation, video and editing, marketing, game development.

Personal Satisfaction

11 students experienced satisfaction on a personal level. They were proud of presenting their final product to an audience, they developed their creativity or felt motivated to get involved. One student said: *'The greatest satisfaction is the motivation it created. I did my research in English for the first time'*. Another student mentioned that this experience taught her how to organise her time better. One student referred to having discovered *'the pleasure of researching and discovering information that led to even more questions worthy of investigation'*.

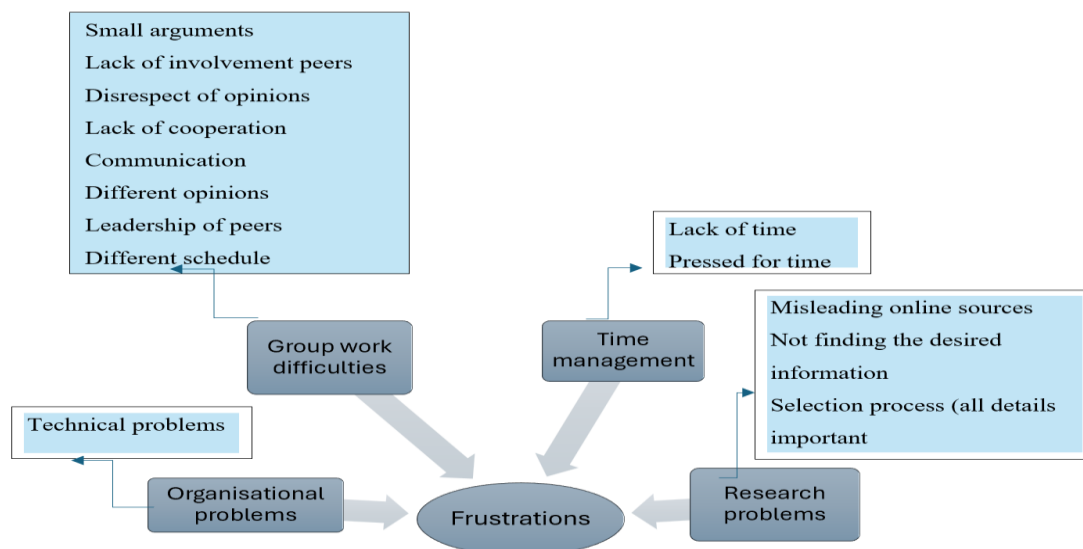
Interestingly, social satisfaction is valued more than personal one, and almost equally to academic satisfaction. We consider that the prominence of social satisfaction over the personal one, especially at high school level might be due to adolescents developmental priorities. Peer relationships and social belonging are central to their identity development. According to Self-Determination Theory, relatedness, the need to feel connected to others, is one of the three basic psychological needs (Ryan & Deci, 2000). Consequently, being part of a team holds more weight than personal accomplishments. Another reason may be the fact that

working collaboratively might reduce the individual pressure, making students feel more confident and supported. The social satisfaction may be greater than if the whole burden were on one single person. Regarding the equality of social satisfaction and academic satisfaction, we consider that the two are intertwined because learning doesn't occur in isolation but through interaction with others (Vygotsky, 1978).

Frustrations

The students' responses revealed several sources of frustration related to project activities, as illustrated in Figure 5.

Figure 5. Frustrations experienced by students



There were 36 answers and among them 7 students responded that they experienced no frustrations related to the project. There remained 29 students who experienced frustrations, the majority of whom (16 students) reported group work difficulties. There was a small minority (5 students) who reported time management issues as frustrating as well as research problems (4 students). Only 3 students reported frustrations that were external to them and difficult to deal with, such as technical problems.

Regarding group work difficulties that students reported to have encountered, they mentioned small arguments with their peers (2 students) due to difficulties in reaching decisions because of different opinions, or poor peer involvement or commitment (3 students) as one student put it: *'when colleagues didn't want to do their share or when they didn't respect the schedule and left the group meetings earlier'*. Students reported frustration when they were stuck for ideas and when it was difficult to make their opinion heard or understood when working in a team.

Despite the difficulties encountered, we can assume that minor conflicts arising from difference of opinions may offer opportunities for developing negotiation, conflict resolution skills and practising mutual understanding and finding common ground through open dialogue. Moreover, one student explicitly mentioned that although the group struggled with time management and conflict, they managed to self-regulate. This reflects a growth in emotional intelligence. Experiencing and overcoming interpersonal and organizational challenges within a safe, educational context prepares students for similar real-world situations, both in academic and professional settings. Four students mentioned research problems as being frustrating as *'it*

was difficult for me to select and summarise as everything seemed important’, one student responded. Another student considered frustrating not finding the detailed she desired or the difficulty to provide accurate information: ‘I felt frustrated when I discovered that online sources did not provide accurate information’.

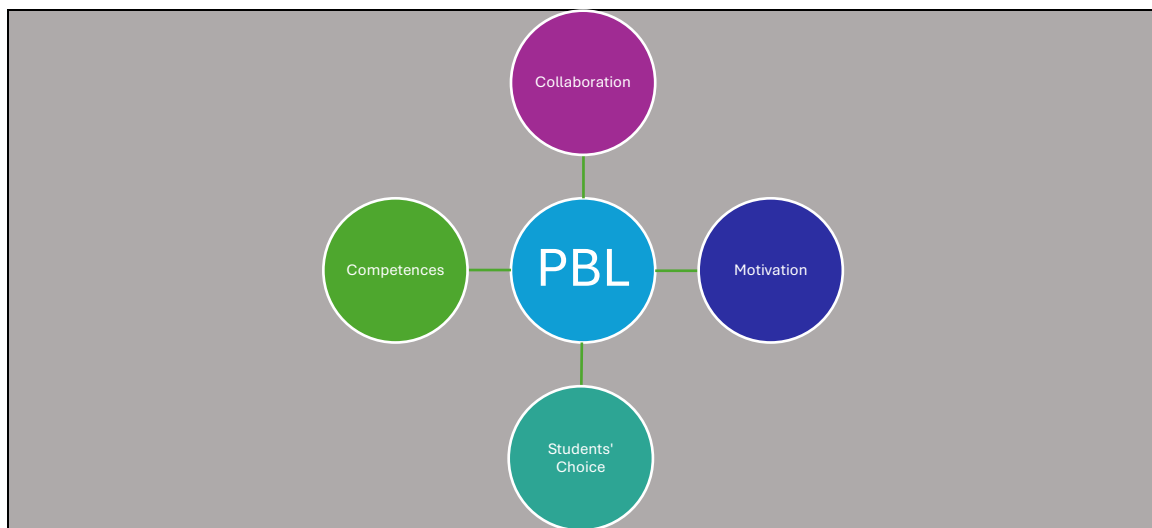
We can assume that when students face research challenges they develop their critical thinking while working through PBL. As reflected in their frustrations such as difficulty in selecting and summarizing relevant information or encountering inaccurate online sources, PBL encourages students to evaluate, analyze, and synthesize information critically. By working in teams, students can engage in discussions that refine their understanding, challenge assumptions, and improve decision-making skills. Collaboration allows them to share different perspectives, identify reliable sources, and develop strategies for managing complex information. This process not only strengthens their ability to think critically but also enhances their problem-solving skills, preparing them for real-world challenges.

D. DISCUSSIONS

The majority of students (over 76%) enjoyed working on the project a lot. It is important to mention that it was their first experience with PBL and they have experienced some aspects of PBL for the first time. For example, time management was an issue they struggled with as it was difficult to stick within the set time limits.

4 key elements emerge as significant in connection with the PBL activities: **Motivation, Students’ Choice, Competences** and **Collaboration** as presented in Figure 6. At the centre of the diagram is Project-Based Learning (PBL), the instructional approach implemented in the study. PBL is shown as being interconnected with the four core elements, each surrounding element highlighting a specific dimension of student growth fostered through PBL.

Figure 6. The interdependency of components within PBL framework



Collaboration and PBL

The study revealed that the implementation of Project-Based Learning (PBL) marked a significant shift in the group dynamic, demonstrating to the students that, despite previous interpersonal challenges, they were capable of collaborating effectively and producing outstanding outcomes. PBL is an effective approach with classes which encounter frequent interpersonal conflicts, including disagreements, clashing opinions, and a general difficulty in

achieving group cohesion, which may result in challenges for both students and teachers when attempting to work collaboratively. It is particularly important to use PBL in class if teachers want to strengthen peer relationships, especially in classes which are struggling to collaborate effectively. Through shared goals and structured teamwork, the experience fostered a renewed sense of unity, encouraging students to move beyond conflict and recognize their collective potential.

While collaboration in the PBL setting boosted motivation, curiosity, and engagement, it didn't have the same impact on self-esteem and self-confidence for many students. One possible reason may be the feelings of frustration and unfairness due to unequal involvement from peers. When not all group members contribute equally, some students may feel their own effort is overlooked or others are carrying the load, which can undermine confidence rather than build it. Another reason may be the fact that students' collaboration was more of a means to accomplish a task, rather than a space for self-development. Besides, if students do not feel confident already, one collaboration experience may not make a big difference. However, for students with lower levels of self-confidence collaborative work may be particularly beneficial. This process proved to be empowering, reinforcing their sense of competence and making their contributions feel valuable, which is another key motivator.

Motivation and PBL

One of the most significant impacts of PBL is on students' motivation, particularly intrinsic motivation. Through engaging in relevant tasks, students found personal meaning in their work, which led to increased engagement and sustained interest. The authentic nature of projects supports students' sense of purpose and autonomy, key drivers of motivation according to Self-Determination Theory. Project-Based Learning (PBL) has been found to significantly enhance student motivation, both intrinsically and contextually, by fostering engagement, curiosity, and a sense of purpose.

One of the most powerful motivational drivers within PBL was the sense of self-efficacy students experienced when they were able to make meaningful contributions to the project and witnessed the tangible outcomes of their efforts. The opportunity to explore real-world, relevant topics which held personal and civic significance reinforced the belief that their work held value beyond the classroom, increasing their motivation to engage deeply with the tasks. This was often accompanied by greater attention, increased willingness to conduct research, and heightened interest in reading, even in a foreign language, due to the intrinsic purpose tied to the task.

Competences and PBL

Project-Based Learning (PBL) creates a dynamic educational context in which a wide range of key competences are actively developed through authentic, student-driven tasks. Among the most prominent are 21st-century skills, including critical thinking, communication, collaboration, and creativity. PBL provides opportunities for students to engage in self-directed learning, which enhances their autonomy, decision-making abilities, and time management skills which are all essential components of personal, social, and learning-to-learn competence. Through the iterative processes of planning, executing, and presenting projects, learners cultivate project management skills, problem-solving strategies, and a greater capacity for self-reflection and intellectual growth.

Importantly, the collaborative nature of PBL fosters cooperation, negotiation, and the appreciation of diverse perspectives, which are essential to both social competence and civic engagement. The sense of ownership and relevance that emerges from project-based tasks contribute to the development of motivation, confidence, and a sustained commitment to

learning. In sum, PBL acts as a comprehensive framework for the cultivation of competences that are both academically significant and transferable to real-world contexts.

Students' choice and PBL

The majority of students considered freedom of choice of great importance, as they perceived it as an opportunity for their voices to be acknowledged and to engage in work that carries personal and social relevance. At the same time, this autonomy in selecting the subject which they considered relevant and impactful increased their motivation and personal investment. One interesting aspect which the questionnaire revealed was the fact that even though the topic was their choice, one-third of students reported that the chosen topic was not personally relevant to them, but they became more curious and convinced of its relevance while working on the project.

However, the vast majority considered the topic of high relevance to students of their age. This suggests that their engagement extended beyond individual interest. We can assume an emerging sense of civic responsibility, as students demonstrated engagement not necessarily based on personal interest, but on the perceived value the topic held for their peers. Their willingness to contribute to a cause that may not directly affect them, but which they believed to be socially significant, reflects a sense of civic-mindedness and social awareness that could lead to collective well-being and responsibility, an essential dimension of civic competence.

CONCLUSIONS

In conclusion, it can be inferred that the four core elements central to project-based learning, motivation, student choice, collaboration, and competences, are not independent factors, but rather closely interrelated and mutually reinforcing. Student choice plays a pivotal role in enhancing motivation by fostering a sense of autonomy. When students are given the opportunity to make decisions regarding their learning, such as choosing topics, methods, or roles, they are more likely to experience ownership and personal relevance, which are well-established drivers of intrinsic motivation (Deci & Ryan, 2000).

Similarly, collaboration contributes to the growth of competences with particular emphasis on transversal competences such as critical thinking, project management and problem-solving, while simultaneously supporting student motivation through shared goals and peer engagement. Working with peers provides opportunities for shared goals, mutual support, and constructive feedback, all of which can boost engagement and create a more dynamic and emotionally supportive learning environment. As students build their competences, especially transversal skills, they often gain confidence in their abilities, contributing to students' self-efficacy and sense of achievement. These experiences of mastery can significantly reinforce learners' internal drive to engage, thus strengthening their intrinsic motivation.

Together, these elements create a synergistic learning environment where students are actively engaged, empowered, and equipped with essential life skills.

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