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MASTER'S THESIS

The Role of English Language Teaching in Project Based Learning:

- Exploring Cross-curricular Possibilities for Project Based Approach to Learning
(in a Montessori Environment)

Uloga nastave engleskog jezika u projektnom učenju:

- istraživanje mogućnosti kroskurikularnog povezivanja kroz projektnu nastavu
(na primjeru Montessori škole)

Mentor: prof. dr. Larisa Kasumagić-Kafedžić

Student: Adnan Korman (V, 2556/2016)

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Abstract

The thesis explores the role of English Language Teaching (ELT) in Project Based Learning (PBL) and interdisciplinary teaching. The thesis also explores the possibilities for introducing PBL principles into school curricula, with a specific focus on online teaching and COVID-19 pandemic affected teaching and learning circumstances. Finally, the thesis presents several examples of good PBL practices in schools (not necessarily ELT practices) and analyzes those projects in detail.

A small-scale research was conducted to support the following hypotheses:

H1: Students meet the expected learning outcomes in various subjects through interdisciplinary project-based learning.

H2: Project work helps students develop holistically and acquire more diverse sets of skills than the more traditional teaching approaches;

H3: Project work encourages interdisciplinary teaching and provides teachers with a solid framework for cross-curricular approaches.

The research was based on two different interdisciplinary projects designed by the author of this paper in a school system that follows the Montessori philosophy. Nine (9) teachers participated in the realization of these projects, making efforts towards interdisciplinary teaching. The research included a study featuring pre-testing and post-testing in the English language instruction with experimental and control groups, questionnaires for the students, and interviews with the teachers. The study was conducted in online schooling conditions.

The findings are presented, the students' and teachers' experiences are recorded and discussed, the conclusions about both benefits and weak points are listed. Other ideas and useful projects are suggested and presented with detailed instructions regarding structure and activities, therefore being of immediate practical use and applicability for educators and project/workshop designers interested in implementing them in their practice.

The findings suggest that project-based teaching and learning facilitate and inspire interdisciplinary approaches. In fact, subject correlations are key to project designing process and therefore, by default, ask for cooperation between teachers across subject areas. The universal nature and breadth of project topics is immense and the less limited the initial idea is, the more versatile the execution of the project will become. The research suggests that, though not always easily assessed and precisely measured, the majority of project participants benefit significantly more from the interdisciplinary nature of the project ideas than from tackling subject work through separate activities focused on a single subject at a time.

Key words: COVID-19, English language teaching, interdisciplinary approach, Montessori, project-based learning

Introduction

Project work in education is considered challenging and burdensome, as it often requires time, organization of people, space and resources, and sometimes also finances. This thesis sets out to demonstrate that project work carries significant benefits for both students and teachers, as well as educational institutions in general. It is an attempt at encouraging teachers to make long-term efforts and work on ongoing “lessons” rather than separate units seen as distinctly belonging to certain subjects. In other words, this thesis encourages a holistic development of children and an approach to teaching that supports it.

The primary goal of this thesis is to explore the possibilities for improvement in the existing paradigms and approaches in English language teaching (ELT) through the implementation of the principles of project-based learning (PBL). The thesis regards PBL through a very general framework of project work (not necessarily within ELT). This means that ELT is seen as a tool for conducting project work rather than is PBL considered a method or technique employed in language instruction. However, the overall goal of the thesis is to examine the possibilities for interdisciplinary teaching with project work as a central point around which subject curricula revolve and to which each subject area included contributes in its own way. In such settings, ELT becomes a tool for the realization of a project, a medium of further creation that goes beyond the goals of language teaching as such.

In order to explore the possibilities of employing project work for achieving learning outcomes set by the subject curricula, the thesis presents a small-scale research study that follows a group of learners (ages between 9 and 11) as they worked on two different projects in a Montessori primary school. The projects were designed by the author and pre-tested through an experimental phase in order to collect the action research data, which later helped improve the project structure. The trial period proved quite useful in pointing out the potential directions which the projects might take. The paper briefly describes the experimental phase and lists its useful insights and valuable feedback, but focuses primarily on presenting the theoretical background which guided the creation and execution of the research study and the findings resulting from the data analysis.

The research study presented in this paper was conducted in the academic year 2019/2020

with a mixed group of 4th, 5th and 6th grade students of the private Montessori primary school *P.O.Š. Bloom* in Sarajevo. The projects were designed and coordinated by the author of this thesis, but they included subject areas other than the English Language and Literature and a number of teachers and students were involved in the realization of the projects, thus allowing for the research to examine the possibilities of interdisciplinary teaching on a school level within a project framework. The research results offer valuable insights into different possibilities of using project work in language instruction, but it also very much encourages teachers of all subjects to notice and help form correlations, and, finally, take an interdisciplinary approach to teaching on a school (i.e. any educational institution) level. Cross-curricular approach is a highly praised and valued, and yet not so unattainable, ideal often found in the existing educational literature. This paper demonstrates a wide array of possibilities for attaining this ideal on the institutional as well as individual level (by this we mean the role of every teacher in either initiating and leading or giving valuable contributions to project work). We wish to encourage innovation in language teaching and offer feasible frameworks for educators to introduce new perspectives on not only teaching practice or curriculum development, but the goals of education in general. This work is only a small contribution towards developing an educational strategy that is beneficial for both individuals and societies at the same time, as this is the only way for social progress to occur. Project work certainly offers great potential for such achievements.

In chapter 1 of this paper we present the theoretical paradigms from which project work stems and/or those that share common features; some of the major overlapping concepts include: the development of “soft skills” and learning to learn competences, experiential learning, pragmatism, constructivism, and task/problem-based learning. Other than that, this chapter also offers basic information on the novelties in the world of education that imposed themselves as a direct consequence of COVID-19 closures in countries around the world, as well as how these changes in teaching conditions have affected various education systems. It is common traits and patterns in dealing with the issue that were later on compared against the findings of the study presented in this paper.

Chapter 2 offers step-by-step description of PBL projects conducted by other authors as well as those executed by the author of this paper, as pilot activities within the action research framework. These projects provide a clear and comprehensive insight into the technical

issues (such as practical conditions needed) as well as the structure and methodology accompanied by end results of several different projects. Any educators interested in similar approaches will be able to form an overall idea of what project work is, what it requires, and what some of the major benefits of the approach are, before they design a project and decide to pursue this style of teaching.

Chapter 3 deals with the research study conducted by the author in a Montessori environment, within the circumstances of online schooling caused by the government-mandated lockdown due to the COVID-19 pandemic. As previously mentioned, all the findings of this study are therefore to be seen and understood in this very context. However, it is worth noting that there still are universal and everlasting pedagogical implications that must not only be limited to a such, nor any other whatsoever, specific set of circumstances.

Chapter 4 presents the research data analysis. The analyzed data supports the theoretical framework, proves the hypotheses, and offers direct insights into the variables in students' learning outcomes that set project approach aside from the more traditional subject teaching.

Chapter 5 discusses the entire action research, commenting on the benefits of project work in the field of education. It is those benefits that present themselves as directly resulting from PBL approaches for students and educators alike.

Chapter 6 offers concluding remarks and summarizes the findings and outcomes of the research. It acts as the red thread that connects the entire structure of this paper in its ultimate goal: to help improve the quality of any future endeavor in project work with insights and creative by-products of thinking-on-one's-feet innovation gems (that can only be brought to surface by such spontaneous and courageous efforts) which project work, in my humble personal opinion, truly is.

It also presents project ideas that were not realized by the author, but played a part in the action research process and emerged as innovative and creative activities that could be integrated into one's teaching, whether project-based or not. These useful ideas and suggestions also contain both very concrete, ready-made, activities and accompanying materials, as well as general observations and recommendations.

1. Theoretical background

1.1. The significance of the topic: why choose PBL?

The focus of this thesis is the English language instruction, rather than project work in education, as such. Project work is a more general approach to education that can be implemented universally, i.e. regardless of the subject, context, or goals of a project. However, the disciplines such as physics, chemistry, technical education and alike more often introduce subject matter through different projects than it is the case with language arts. Furthermore, it is generally perceived as somehow “logical” or “natural” for the more technical subjects to be connected to working with materials, equipment, tools, performing experiments etc. Nevertheless, it is needless to say that the possibilities for teaching languages through projects are numerous since language is the most common and most efficient medium of communication. It is, therefore, necessary that language educators think outside the box and understand the potential for innovative, creative, problem-based and project-based language teaching. Unfortunately, language curricula are still prevalently based on rather conventional methods and approaches. For example, there is still much reliance on the grammar-translation method in language instruction. Language teaching should not be limited to the scope of the meta-language of grammatical analysis. Literary texts should not be approached only in traditional ways, where the text is seen as isolated, detached from real life, existing only in abstract literary terminology and the world of fiction.

As it was previously mentioned, language instruction often tends to stay at the level of examining grammar and literature only for the sake of language learning, often not realizing that language is not only the content of the instruction itself, but also a medium for transmitting messages that carry various meanings and topics not focused exclusively on language per se. The power of language to provide the possibility for communication is its greatest advantage in becoming a tool for project learning. The belief that language instruction cannot be adapted to the principles of project work is a misconception, since it is in contradiction with the basic defining features of project-based learning (PBL). To start with the most obvious one: according to the Buck Institute for Education (BIE), the final product of project work should be a palpable, concrete, material item which is afterwards presented to the public and, at best, made available for practical public use (BIE, 2016). There is virtually no need to look for empirical evidence that language is in everyday public

use. It is, furthermore, the most universally available resource across racial, ethnic, economic, scientific, and any other boundaries and divisions in social structures. The main goal of PBL is to provide solutions for real-life problems and help students develop the necessary skills in finding answers to different questions. By focusing on the practical and useful solutions to contemporary problems, it reminds us of the tasks our everyday reality puts before us.

In ESL (English as a Second Language) environments and any other academic contexts where English is the first language of communication, other subjects too are taught and explored in English. In such cases, ELT has an important role in almost any other discipline students are dealing with: an essential element of any academic's expertise is the linguistic competency to acquire, discuss, and present the principles and ideas of their discipline in speech or writing. In EFL (English as a Foreign Language) contexts, on the other hand, interdisciplinary teaching and project work offer opportunities to see the language in use within professional registers and texts other than literature, to practice communicative competence, to put in practice grammatical, lexical, and even literary knowledge and skills acquired through language subjects.

As mentioned above, the advantages of exploring a language further than its grammatical rules and literary texts are numerous and it constitutes a rather necessary part of the development of 21st century (also referred to as "nonacademic") skills: the "4Cs of critical thinking, collaboration, communication and creativity," as well as "life and career skills" and "information, media and technology skills", to name a few (National Public Radio, 2015).

There are numerous other skills that PBL involves. However, its importance lies also in its ability to promote and develop values. In the world of today, we know that education becomes, more than ever, a crucial messenger of peace and tolerance, intercultural competence, peaceful coexistence and understanding of others who are different from us. Apart from skills, therefore, the values that PBL inspires, develops, and promotes help build competent 21st century individuals capable of engaging actively in global citizenship, and taking social, ecological and moral responsibilities. The so-called "soft skills" are usually defined as "interpersonal qualities, also known as people skills, and personal attributes that one possesses" and often include the following: integrity, communication, courtesy, responsibility, social skills, positive attitude, professionalism, flexibility, teamwork, and work

ethic (Robles, M., 2012).

According to Robles (2012, p.1), “business executives consider soft skills a very important attribute in job applicants”. This paper sets out to explore to what extent project work is efficient in developing these skills and competences in participants. This paper, however, will particularly focus on the *eight key competences* as defined and listed by the “*Recommendation of the European Parliament and of the Council of 18 December 2006 on key competences for lifelong learning*”. The description of these competences are retrieved from the Official (web) Journal of the European Union (*OJ L 394, 30.12.2006, p. 10–18*), and as such fully listed below:

1.Communicating in a mother tongue: ability to express and interpret concepts, thoughts, feelings, facts and opinions both orally and in writing.

2.Communicating in a foreign language: as above, but includes mediation skills (i.e. summarising, paraphrasing, interpreting or translating) and intercultural understanding.

3.Mathematical, scientific and technological competence: sound mastery of numeracy, an understanding of the natural world and an ability to apply knowledge and technology to perceived human needs (such as medicine, transport or communication).

4.Digital competence: confident and critical usage of information and communication technology for work, leisure and communication.

5.Learning to learn: ability to effectively manage one’s own learning, either individually or in groups.

6.Social and civic competences: ability to participate effectively and constructively in one’s social and working life and engage in active and democratic participation, especially in increasingly diverse societies.

7.Sense of initiative and entrepreneurship: ability to turn ideas into action through creativity, innovation and risk taking as well as ability to plan and manage projects.

8.Cultural awareness and expression: ability to appreciate the creative importance of ideas, experiences and emotions in a range of media such as music, literature and visual and performing arts.

The research results of this study will be compared against the criteria set by the above competences.

1.2. The place of PBL among other educational paradigms

There are several interconnected concepts that heavily rely on the same principle of practical learning focusing on everyday reality as both the main source of inspiration and the ultimate goal of education itself. These concepts include experiential learning, pragmatism, constructivism, project-based learning (PBL), and task/problem-based learning.

Experiential learning is related to the project method. The project method is “a natural extension of what is already taking place in class” (Stoller, 2002, p.109), an open learning process, the limits and processes of which are not strictly defined, which progresses in relation to the specific teaching context and learners’ needs and interests (Frey, 1986; Kriwas, 2007).

The project method originates from Pragmatism, the philosophical movement which appeared in the middle of the 19th century and promotes action and practical application of knowledge in everyday life (Frey, 1986, p.31). Major proponents of Pragmatism are J. Dewey (1935) and W. Kilpatrick (1935) in the U.S.A., and H.Gaudig and G. Kerschensteiner in Germany. The implementation of the project method was based on the following pedagogical principles, expressed by many progressive educators (Chrysafidis, 2005): a) promotion of manual activity instead of memorization and verbalism, b) learners’ active participation in the learning process, and c) exploitation of facts related to the immediate reality as a source for learning.

We could also consider the similarities between PBL and Communicative Language Teaching (CLT). CLT has lately been recognized and widely accepted as a method which can offer a better response to the educational needs of the 21st century learners than other, previously developed, methods, such as Grammar Translation, Audiolingual, and Direct methods (Kelch, K., 2011). The main difference lies in the fact that CLT focuses on developing communicative competence using language instruction as its main medium. This transforms the language teaching and learning into a tool for achieving an objective, not objective in itself. (Kelch, K., 2011)

If we examine more closely some of the defining characteristics of CLT, we will find some of the following ideas, as presented by Kelch (2011):

- Prepare students to use language both productively and receptively in unrehearsed, real-world contexts according to their needs
- Utilize the language teacher as a facilitator and guide in a student-centered classroom rather than as an all-knowing controller in a teacher-dominated environment
- Enable students to be active participants in a collaborative, cooperative learning process

As we set out to explore the PBL principles, we will find that the above three are among the most basic and crucial ideas in PBL learning and teaching.

There are several key elements that define project based learning and set it apart as a specific learning method. A concept that describes PBL very broadly and generally is “learning by doing”. In that sense, we can go back to the very beginnings of human history in search for the first advocates of such a learning method. We know that both Confucius and Aristotle emphasized the importance of learning through actively engaging in an activity.

Another advocate of empirical inquiry rather than theoretical scrutiny was Maria Montessori, an Italian physician and child-development expert who contributed to bringing “experience upon the environment” to prominence (Edutopia 2016). In addition, PBL relies very much on the ideas and principles of Constructivism. Both Piaget and Vygotsky stressed the importance of the interaction between an individual and the environment in further constructing (“scaffolding”) the individual’s knowledge and skill level. What is it, therefore, that makes PBL earn its significant place within the existing educational paradigms?

In general, the “landmarks” that help us recognize a PBL project can be found in the following descriptors that preset PBL as an “in-depth investigation of a topic worth learning more about, the construction of a personally-meaningful artefact, which may be a play, a multimedia presentation or a poem, (through which) learners represent what they've learned”; furthermore, PBL offers the learners “more autonomy over what they learn, maintaining interest and motivating learners to take more responsibility for their learning”; in addition, PBL allows the learners to choose their own speed and style, to set both the pace and the tone

of their learning since they “shape their projects to fit their own interests and abilities” according to their own learning styles (Grant, 2002). All of the mentioned features eventually reinforce the final result – the creation of a “personally meaningful artefact”, therefore making the learning personal and allowing the learners to become “responsible for their own learning” (Harmer, 2001). With such a setting, learner autonomy is implicit, and it all results in a set of personalized individual learning practices the ultimate goal of which is to enable the learning to continue even without the presence of teachers - an ideal towards which Maria Montessori suggests all teachers should strive (Montessori, 2012).

We have witnessed the shifts of educational paradigms, whether in a broader, more general sense, or in language acquisition specifically. Some of the existing methods and approaches were previously mentioned (Grammar Translation, Audiolingual, and Direct methods, the Communicative Language Teaching). All of these and many other methods, approaches, and techniques are still present and in use, even if some of them proved inefficient in achieving the desired learning outcomes. The reason for this may be found in an article concerned with the latest paradigm shifts in (language) curriculum development (Parviz & Nima, 2013). The authors refer to the view that new paradigms emerge as complementary extensions to the old ones. If an approach is consistent and compatible with the reality, it will be sustainable enough, even with certain anomalies. A shift then occurs in order to solve the existing anomalies, resulting in an improved complementary version of the existing approach (Parviz & Nima, 2013).

To sum up, PBL is not a completely new or revolutionary paradigm, but rather a platform that allows learners to explore a multitude of educational paths, while retaining the possibility to pave the way to the emergence of the new, “updated” versions of teaching and learning in an ongoing process that carries in itself the philosophy of a continuous, never-ending development and learning. This is confirmed by the insights of Reg Revans (1971) on what he named *action learning*. This concept offers a useful framework within which we can further define and better understand PBL. *Action learning* was a term coined, yet never defined (within a single definition) by Reg Revans. Maybe it can be best understood by considering his epithet that says: “*There can be no learning without action and no (sober and deliberate) action without learning*” (Pedler, 2011, xxi).

Finally, if we apply the final thought from the previous paragraph, by itself undoubtedly universal and timeless, to the modern education contexts with ever more online hours and technology-based teaching and learning, we must be able to see “action learning” grow and develop in the light of any contemporary or future set of circumstances. In other words, if action learning can be seen as universal by educators in various contexts, its principles will be applied regardless of the circumstances. In the world of today, online learning has become the new normal. A number of parents and teachers, as well as psychologists, are expressing concern that it is exactly “action learning” principles and meaningful learning that is lacking in such practices popularized, and sometimes also limited, by the requirements of online education.

On a very general level, the major challenge posed by online models for both teachers and learners is redefining “action” into something that can be understood as practical and useful, therefore meaningful, by students even if that includes the virtual form of reality. It is now rather obvious that there is a number of items (in areas such as visual and audio content, business and services, currency, entertainment and many others) that are, even though completely virtual in origin and existence, attributed real-time and real-life value. This might imply that the first step in integrating action learning principles into the world of virtual reality will require the redefining of educators’ understanding of the primary mission of education itself: to prepare for life, as emphasized and encouraged by Montessori herself on numerous occasions (Montessori, 2012).

1.3. What is PBL and why is it important in ELT?

Project Based Learning (PBL) is only one possible approach to take in teaching English as a Foreign Language (EFL). However, many aspects that are almost crucial in teaching EFL are found in the very concept of PBL. We shall first briefly define the main features of PBL, its origin and basic structure. Afterwards, we will point out some of the crucial points of project-based work for teaching EFL.

According to the website *bie.org*, PBL is a teaching method based on students' active engagement in solving a problem, responding to a challenge or answering a question. Students are investigating for an extended period of time (BIE, 2016). The provided definition already implies the long-term nature of PBL. Both students and their teachers go through different stages of a project, asking questions, making conclusions and acquiring a variety of skills. One of the major characteristics of PBL is its focus on dealing with real life issues, i.e. solving real and existing problems. This ensures that its products be useful, practical, and directly applicable solutions.

As the site *edutopia* informs us, this kind of approach to learning was proposed even by Confucius and Aristotle. Another proponent of "learning by doing" was John Dewey, a 20th-century American educational theorist and philosopher. His main contribution was based on his refusal to see students as passive recipients of knowledge. As Dewey pointed out, "Education is not preparation for life; education is life itself" (Edutopia, 2016). We should mention rather briefly Maria Montessori, an Italian physician and child-development expert who contributed to bringing "experience upon the environment" to prominence. Finally, Jean Piaget gave an insight into the way we learn meanings from experiences and his work became the underlying concept of the organization of PBL stages. The logical sequence of project stages therefore resembles the way in which our mind is processing information acquired from experience (Edutopia, 2016).

This short review of the history of PBL hinted at some of its defining characteristics we shall now discuss. By simply listing the primary features of PBL we shall be able to see the logical sequence of enquiring knowledge and skills through project-based work. As the website *bie.org* informs us, the defining elements of PBL teaching include:

- Critical thinking, collaboration, and self-management → these aspects are usually related to group or pair work and refer to the development of students'

cooperating skills. Project work provides ideal circumstances for communication and collaboration skills to develop. In fact, in PBL these are fundamental conditions and primary media necessary for carrying out the entire project. (BIE, 2016)

- A meaningful problem → what is often defined as “driving question” in PBL is not only a contemporary real life issue, but it is also adapted to students’ interests, age, area of study, immediate environment, cultural background etc. To put it simply, students can easily see their tasks as useful, meaningful, and purposeful. (BIE, 2016)
- High level of motivation → as Alan Maley noticed, PBL “provides one solution to the problem of learner autonomy, of making the learner responsible for his own learning” (Fried-Booth, 1986, p. 3). The fact that students regard the project as “theirs” and find themselves responsible for their work results in a high level of motivation noticed in these projects. (Fried-Booth, 1986)
- Student Voice and Choice → as the website *bie.org* informs us, students are allowed to make certain decisions regarding the project. The freedom of choice in PBL resembles the act of involving students in curriculum planning in order to ensure seeing students as active subjects of an educational process. Later in this chapter, when we start defining the PBL stages, we will discuss this issue in detail. At the moment, we should only mention that both teachers and students are involved in the project. However, the role of teachers is to provide valuable assistance. They act, as Fried-Booth says, as “counsellors” and “consultants“, in order to provide valuable assistance (Fried-Booth, 1986, p. 5).
- Revision and Reflection → Another feature of PBL that is of great significance is the fact that students get feedback on their work, and they edit (revise and improve) it gradually. Revision of the subject matter during project work process allows for any mistakes to be corrected along the way. In this way students can also test certain methods and experiment with various options eventually choosing the one they consider to be the best solution (BIE, 2016).
- The public → An important factor which contributes to both the authenticity of a project and the motivation of students lies in taking the project results out

of the classroom and presenting it to the public. In this way, the work can be evaluated, upgraded, and generally subject to feedback from various sources (BIE, 2016).

Now that we listed the defining features and briefly explained their implications, we can move on to present the basic structure of a PBL process. We shall now discuss a general framework of PBL stages before turning to specific projects and considering their features:

Diana L Fried-Booth (1986) divided the process into three stages:

1. Classroom planning
2. Carrying out the project
3. Reviewing and monitoring the work

1 → Classroom planning includes discussing themes and goals of the project. Students at this stage also consider their specific language needs and discuss the way to carry out their project (collecting the needed material/information often involves conducting interviews, talking to different people, researching different themes etc.). Project work can obviously function for a wide range of disciplines and explore various subjects. Wilga Rivers noticed: "As language teachers we are the most fortunate of teachers--all subjects are ours. Whatever [the students] want to communicate about, whatever they want to read about, is our subject matter" (Rivers, 1976, p.96).

Therefore, the importance of PBL for teaching EFL is not by any means questionable. In fact, PBL is often the best way of testing language knowledge in a concrete context. As Fried-Booth notices, PBL should not be necessarily restricted to intermediate and advanced students. Rather, the pattern can remain the same as long as language requirements are adapted to the students' level of knowledge.

2 → All the stages are equally important and they create a chain of activities where every element is necessary and irreplaceable. However, if one stage could be considered exceptionally important, it would be stage 2 – carrying out the project. It is at this stage that students start using their current knowledge and become aware of their shortcomings, but also learn more about themselves in many different ways – they begin to understand their qualities as leaders or group members, they begin noticing how they feel about doing something and how communicative they really are. In other words, they become aware of their society and their own role in it. Technically, at this stage, students actually perform all the activities they

planned in order to gather information or ideas and find out possible ways to solve the problem.

Again, from the point of view of teaching EFL, the huge potential of PBL gets even more evident at this stage. As Fried-Booth notices, not only that students use all *four skills* at the same time (which is always hard to achieve in the traditional classroom circumstances) but they do it “in a naturally integrated way”. (Fried-Booth, 1986, p. 6)

3 → This stage is integrated in the entire project, it does not strictly follow stage 2. The importance of constant reviewing and monitoring the work is crucial for learning through identifying and correcting mistakes, evaluating results and directing the work altogether if such directing is needed. One of the characteristics, as we have already mentioned, of PBL is learner autonomy or the fact that learners are responsible for their own learning. However, we also mentioned the role of the teacher as a consultant and counsellor – this means that students plan their activities together with their teacher, discuss the best methods and evaluate results. This aspect of the project offers a great scope of possibilities for teaching EFL. As Wilga Rivers (1976) pointed out: to carry out the project, regardless of the theme in focus, students are using language to communicate and inform themselves and others about the subject matter. In order to do that successfully using a foreign language, they perform preparation activities in the classroom where they predict their possible language needs and practice using them at stage 2. In addition, the monitoring done by the teacher results in feedback and triggers discussions and debates regarding the process itself and the results and solutions proposed. One could argue that a project devised in this way and based almost completely on active communication makes it attainable only for intermediate and advanced students. However, we shall later discuss what possibilities there are for young learners to engage in a similar language learning process.

1.4. Specific conditions needed for PBL

The conditions needed for a PBL project depend on and result from the very nature of the project. Various subjects require various research activities. How the project will be designed and what possibilities for its realization exist is also conditioned by the immediate environment and features of the local community (school, institutions, cultural traits etc. can influence the project.) In project work, it is even more important that teachers know their students' family and religious backgrounds, their interests, level of knowledge and, if there are any, physical or intellectual disabilities.

Therefore, every teacher should consider these specific conditions and try to tackle as many issues as possible in order to provide the students with much needed help.

Some of these special requirements, as defined by BIE.org, include:

- first of all, the students should agree with the idea of project work and participate in choosing the subject matter (defining the driving question)
- the driving question should be an issue that offers enough accessible material: an additional requirement for teaching EFL is providing the material in English even in a non-English speaking environment. Fried-Booth hints at some possibilities such as banks, embassies or other institutions that can provide ready-made material in English. Even without such options, teachers can try to provide a greater amount of material.
- students must be provided with enough time and space to engage in project work; these activities must be coordinated to fit into the curriculum, not to be an unnecessary burden.
- the teacher should gain approval from both school and other institutions that should offer materials to the students. All persons involved in the process should be informed about it.
- teachers should be especially flexible and ready to provide enough, but not too much assistance, and accept their roles (as mentioned earlier) of mediators and consultants
- project work requires a greater amount of time and therefore a project can undergo various changes and require different adaptations in spite of extensive preparation
- students should be informed on how to find the needed material and/or information

As the website *bie.org* informs us, there are many different ways in which teachers can tackle all these issues. As Krajcik argues, although project work is widely used in social studies, art and English classes, “project ideas tend to be passed down by word of mouth, or are developed from scratch by teachers themselves.” (Krajcik, 2006, p. 329). To sum up, all the obstacles and specific requirements are actually part of project work and can take its course in a completely new and unexpected direction, which can result in new and interesting experiences for both teachers and students.

Apart from providing the aforementioned specific conditions for PBL projects, we could argue that the teacher’s role is the crucial element of success of any project work and therefore its requirements go beyond what was listed so far. Even though the project itself will determine and direct the teacher’s efforts towards meeting specific and customized needs of the learners and the project itself, we can still pinpoint some of the universal characteristics of this role of a mediator and facilitator. In practice, this means guiding the process stealthily, from the background, like an invisible hand that moves objects across the stage, but is never seen by the audience. In theory, this is very much in line with how a trained Montessori practitioner is required to teach. Even if we still need to be guiding, in Montessori’s view, we should actually guide by following – she termed this philosophy the act of “following the child” (MCI, 2013, p.3). Here are some of its fundamentals as defined by the Montessori Centre International (MCI):

- Supporting the child as an active learner
- Respecting the inner life of the child
- Trusting the child's inner motivation
- Providing freedom within limits
- Encouraging the child's inner discipline

The module also provides a list of pedagogical principles that scaffold these fundamentals (MCI, 2013, p.3):

- Vertical grouping
- The work cycle
- The favourable environment
- An empathetic practitioner

In order to show how the above principles apply to a day-to-day practice in a Montessori environment, here is an insight into the author's personal experience of teaching in a private, Sarajevo-based certified Montessori primary school.

The vertical grouping results in classes of mixed ages in three-year ranges, starting from 3 to 6 (kindergarten or "Children's House"), moving over to Primary 1, ages 6 to 9 (which corresponds to first- to third-grade students), progressing on to Primary 2, ages 9 to 12 and so on.

Each class spends work cycle time in classrooms where the furniture is adapted to their average height, as well as general age needs and interests. The furniture and the space itself are student-friendly and that comprises a crucial element in the entire educational process, as it encourages independence, organization, order, and it also promotes social and community values through the ground rules that define its usage. In more details, the shelves contain educational materials, prepared beforehand, aesthetically pleasing and attractive to the children. They function as the backbone of the Montessori curricula and in most cases completely replace books and worksheets with hands on, interactive manipulative materials.

Other environmental elements of importance include the sink area and the snack table. This is important for fostering independence, developing focus and supporting the natural learning curve by allowing the students to move around and take their snack at whichever point of the three-hour work cycle they happen to experience "false fatigue" (Montessori, 2012). The children serve themselves, eat their snack at the designated table, wash their dishes and clean up after themselves, just like they do with trays and mats they use as part of school work with the educational materials from the shelves. This is how the "favourable environment" provides children with all the necessary elements to develop self-discipline and time and space orientation, slowly constructing their personal work ethics and social responsibility, as they share the space with others who abide by the same rules.

The key element in structuring all of the above is the "empathetic practitioner", a teacher whose main role is to follow the child and only assist their independence by shedding light on the steps or demonstrating the goals behind activities helping the learners experience first-hand the meaningfulness and practical implications of knowledge, skills, values, and even habits they are acquiring, developing and almost immediately applying on a daily basis, all in one and the same environment often defined as "freedom within limits" (Montessori 2012).

While the “work cycle” has its specific meaning in Montessori terminology, the other principles presented above are quite in line with some universal recommendations we can find in the existing pedagogical literature, on PBL or other approaches. However, it is not always as easy to create such conditions in one’s teaching environment. For the purposes of doing project work, these principles are highly recommended whenever attainable.

With this in mind, we can form a wider picture of the project work setup. Nevertheless, the role of the teacher does not end there. In fact, this is where it begins. Throughout the project, the teacher needs to encourage, motivate, advise, point to an area that needs more work, maintain the group dynamics, ensure fair participation for each child, show support and offer help, but not too often, and, most importantly, trust the learners with the work and accept the fact that the project at hand is ultimately “their” project.

As we set out to describe the projects that form the backbone of the research presented in this paper, we will be constantly coming back to this issue of the importance of the teacher, as with every project we will revisit the teacher’s role repeatedly to detect and examine specific project requirements from this perspective.

2. PBL and ELT in Action: Practical examples of PBL projects

We shall now discuss two examples of PBL projects which have been designed and conducted by Diana Fried-Booth and proved to be successful. These projects are described in chapter 5 of her book *Project work*. After presenting the basic layout of the projects, we shall also briefly discuss some of their features.

3. 1. Presenting the projects

1 → The first example is called *String and pin display: tourist destinations within a town* (Fried-Booth, 1986, p. 59-61).

- FOCUS: increasing students' "confidence in handling casual encounters"
- GOALS: to display public information on a map and present statistical data gathered from the interviews conducted with tourists
- THEME: popular tourist destinations in the area; the interviews serve for providing tourists' opinion and experiences regarding the popular local destinations they planned to visit or had already visited.
- STAGES:
 1. Classroom preparation includes: discussing tourist attractions in the area; a written task with the purpose of listing and ranking the destinations; discussing ways of conducting interviews and the needed amount of gathered data.
 2. The practical part includes pair work – conducting interviews and recording the answers to be analyzed in the next stage.
 3. The revision includes discussing the experience and guessing the results. A large wall mounted street map is put on the wall and the students use pins and strings to present the results graphically.

This project involved also examining the connection between the nationality of tourists and the destinations they visited. The interviews which included gathering the information were conducted by advanced level students. The project was carried out in three weeks and 200 people were interviewed.

2 → The second example represents a project called *Third world display*. It was conducted by the same abovementioned author. (Fried-Booth, 1986, p. 62-65)

- FOCUS: information gathering and presentation, raising awareness of the subject
- GOALS: to display the gathered data publicly; to build a shanty house
- THEME: issues affecting developing countries
- STAGES:
 1. Data collection – teacher contacts agencies and provides students with magazines and newspapers or suggests video or radio programs which may be useful. Students examine the material and start researching or suggest changes. The material and equipment needed (cardboard, clear tape, scissors, rope, string, thin wire, wood offcuts etc.) for building a shanty house and visual presentation are collected.
 2. The practical part consists of producing posters and visuals and building a shanty house. Students also prepare an austerity lunch and make publicity handouts to inform people about their work.
 3. The results/final products of this project are a shanty house with signs saying: “Millions of people live in homes like these”, “no toilet”, “leaking roof” etc. Similarly, the austerity lunch prepared by the students is also designed to attract public attention. The main goals of these activities are drawing attention to the visual presentations and all that students made in order to inform people about their intentions and raise the awareness of the subject.

2.1. Implementing ELT in PBL (and vice versa) in a Montessori environment: Observations and insights from the author's pilot activities

In order for the reader to understand the wider context of project work that will be described and analyzed below, we will provide a short description of the environment in which the activities took place. The school *P.O.Š. Bloom*, where the activities were realized, is a primary Montessori school. The students involved were in grades 4, 5, and 6. In this case, they make one mixed-age group of 54 students in total, classified as the Primary 2 (P2) classroom. Such vertical grouping (with 3-year spans) is one of the key principles of the Montessori philosophy (MCI, 2013) and (in Bloom) it is found on all levels, from nursery through high school. Such vertical grouping of students is supported by the prepared environment, where children can freely approach subject materials found on the shelves, as well as art supplies, equipment, tools, and any other materials or devices available for them and prepared by the teachers. Four or five teachers are usually present in the classroom and they facilitate the learners' efforts, but stay in the background making the students as independent as possible. It is evident how such environment provides plenty of opportunities for creative expression and cooperation between teachers and students alike. Teachers are naturally making correlations and the very structure allows for cross-curricular approach to become a spontaneous by-product of any classroom activity, if not a necessity (what can be argued on certain occasions).

During the academic year 2017/2018, the P2 students in Bloom worked on several pilot projects. Here we will mention only a few and list some of their characteristics that are directly connected to PBL principles. It is also important to mention that the projects that will be presented served the author of this thesis as pilot experiments. It allowed for observation and testing, as well as gathering data and first-hand practical experiences of project work in the Bloom environment. The following section offers brief reports on the pilot experiments and examines the areas of interest regarding project work.

Example 1: Morning Singing Sessions and My Dictionary Project

Each school day would start with a group singing activity. The music teacher would prepare a new song each week. The preparation involved not only the notes and singing guidelines, but also interpretation of the lyrics and discussions on the topics they would sometimes trigger. On certain occasions, such discussions were accompanied by power-point

presentations and short workshop activities organized by the English teacher (the author). Also, any necessary discussion on either grammar, syntax, or semantic aspects, as well as cultural and other topic-driven discussions would often ensue, inspired by these singing sessions. Poetry and other areas regularly found within the language curriculum were spontaneously addressed through the students' work on lyrics and metrics. Such an approach allowed for more focus and attention to certain forms, meanings, techniques, or topics to be addressed from the aspect of the English language and literature curriculum. However, as the title of this thesis suggests, the stress was always placed on English contributing to (rather than being the focus of) this interdisciplinary cooperation. This "help" coming from the linguistic perspective served primarily as a means of facilitating the learning process for the students and inspiring exploration. It is important to emphasize that the author was in this case only contributing to an ongoing music project. This implies that although the project was not specifically designed according to and intended to follow the PBL principles, the outcomes were very much PBL-based since the conditions proved optimal for project work. Even though this was an experimental study and it did not officially pursue any hypotheses, the experience most certainly proved that the English language and literature curriculum can significantly contribute to project work started in other subjects while still meeting the ELT goals and benefitting the students in a cross-curricular, interdisciplinary, and holistic manner. This is a shared goal of both the Montessori approach (MCI, 2013) and PBL principles.

Here we offer examples of these interdisciplinary efforts: on several occasions, the students were encouraged to make their own parody songs, write poems, or make posters, thank you notes, letters, or do small research projects and prepare their own oral presentations inspired by certain songs and/or authors and encouraged and prompted by the English or Music teachers. Such instances of task-based work were always resulting from the cooperation of teachers, the correlated approach to both subjects, as well as (and this not rarely so) the students' own interest and initiatives emerging spontaneously from the singing sessions. The final product of any such instance was very much reminiscent of any other PBL material that could be publicly displayed and analyzed as the project outcome and concrete result of project work. This was one of the most obvious examples of how English language teaching became a part of a greater project work that included other subjects. Through exploration of messages, patterns, forms, styles of music or life and work of the authors, the English language curriculum became rich with meaningful, context-driven, yet reality based content.

The contemporary issues and the language itself became a much needed tool for the accomplishment of a variety of tasks that emerged spontaneously from the interpretation of lyrics and the students' own interests and curiosity. This cooperation between the teachers resulted in benefits for the students from both respective disciplines: as the students worked more on the lyrics, they improved their language skills, and as they applied linguistic analysis, they gained a better and deeper understanding of the music content they had examined.

As the weeks progressed and the lyrics started growing in number, length, and complexity, there was a much greater need for the workshop component to address the topics in question via presentations and various workshop activities (role-play, group-work, demonstrations, etc.). However, in order to cover an influx of topics and messages (including quite significant amounts of unfamiliar vocabulary) coming in on a weekly basis, there appeared the need to enrich the students' vocabulary in order to facilitate their analyses of the lyrics. This gave birth to a new idea. The students were asked to make vocabulary inputs in a small notebook on a weekly basis. Each week introduced new lyrics which resulted in a new set of unknown words. On a very basic level, this offered opportunities to practice alphabetical ordering and other dictionary skills, inspired interest for words and their meanings, opened windows into idiomatic language and fixed expressions related to a theme or topic. Additionally, it offered a new way of practicing grammar, since the students were able to see how one word can assume multiple parts of speech and what role it can play in a sentence. It was easier for students to notice patterns and grammar rules through lyrics, especially when combined with searching for new vocabulary in order to understand lyrics at hand. This resulted in the formation of My Dictionary Notebooks which included more than simple lists of words and their meanings, but rather an in-depth word analysis with more information on the "linguistic environment" of any given word. More details on this idea are provided in the description of the 2018/2019 projects under "My Dictionary Project".

Example 2: The City Model (Art, Technical Education, Mathematics, Geography, Biology, My Environment, Language arts).

As the Montessori environment encourages sustainable and reusable materials and activities that can be repeatedly used by students of different ages, as well as extended and adapted to meet the needs of those who mastered its basic components, the City Model project was envisioned as a PBL idea that would follow such principles while also engaging students as active creators of their own learning material together with the teachers.

During the academic year 2017/2018, the P2 students in Bloom worked on the City Model Project designed to incorporate the skills from several subject areas. Here we will provide a reflection piece regarding the way this PBL project idea was implemented. The goal of such reflection is to provide additional guidelines for such projects in future, as well as to evaluate the success of certain project components.

The very process proved to be smooth, successful, very useful, didactic, and rewarding for the students. The students used their art afternoon (Wednesdays from 1:30 to 3:30) to work on the project. The following table shows the steps of project work on the City Model Project, as well as the corresponding cross-curricular correlations and employment of various subjects:

ACTION	CORRELATIONS AND POINTS OF INTEREST
The students prepared the Styrofoam blocks by cutting them to the desired dimensions so they could become squares and fit the storage space.	calculations and operations → <i>Mathematics</i> the use of cutting and measuring tools and equipment → <i>Technical Education (TE)</i>
The students painted the blocks and designated the areas for roads and crossroads.	calculations and operations → <i>Mathematics</i> painting and decorating → <i>Art</i>
The students made a list of objects they would be able/willing to make for the model and started making them.	English and other languages

<p>The students worked on landscape features with the teacher. They also started forming workshops and teaching their newly acquired skills to each other.</p>	<p>Geography, Biology, English</p>
<p>The students mounted the objects on the model and assembled it for the first time.</p>	<p>English, Geography</p>
<p>The students saw the teacher’s presentation on global warming and assisted in delivering it.</p>	<p>English, My Environment, Biology, Geography</p>
<p>A group of students made research on global warming and presented the facts using the model for demonstration.</p>	<p>English, My Environment, Geography, Biology</p>

3. The context of the COVID-19 pandemic and its implications for ELT and PBL

Surely did every school, every single teacher and student, let alone education system, undergo a period of shock and instability, a feeling of temporary paralysis and lack of direction when around March 2020 a large number of countries in the world went into complete lockdown due to COVID-19 pandemic. For schools, this meant a switch to online models, whether these had already been in place or not, regardless of teachers' and students' means in terms of knowledge, skills, but also space, devices, as well as family needs and other organizational impediments. Each family became a microcosm of its own in need of a sustainable infrastructure that was now void of assistance from the outside world and limited to establishing virtual contacts only. In such conditions, both students and teachers struggled to establish interaction that not only benefits learning, but is often necessary in order for project learning to take new turns and develop on different levels. Without students owning the process and becoming "responsible for their own learning" (Harmer, 2001), project work can be counter-productive by generating unnecessary workload and having negative effects on teaching and learning, planning, and even self-confidence.

A study that looked into the COVID-19 school closure-related changes to the professional life of a secondary school teacher (Kaden, U., 2020) suggests an increase in workload for teachers, but also that "online education can support learning for many students but needs to be carefully designed and individualized to not deepen inequality and social divides". The study also suggests that the context itself urged some major shifts and yielded new approaches to teaching, which is in line with how project work presented in the research section of this paper came to life: from the need to ensure more meaningful teaching and learning in these specific circumstances where lack of connection required more networking and cooperation on various levels in order to enrich the learners' experiences. Interactive and interdisciplinary cooperative efforts are the very foundation of PBL.

As the abovementioned single case study (Kaden, U., 2020) demonstrates, the teacher's workload spiked to above average during the online teaching period compared to his regular workload. The teacher whose experience is described emphasizes "establishing routines and fast feedback for his students" (Kaden, U., 2020, p. 7) as key during the transition to online learning. This is yet another reason why the kind of project work described and presented in this paper might become an effective tool in overcoming such hurdles for both teachers and students. Interdisciplinary approach offers multiple virtual venues where different teachers

and different students can explore a single topic from various angles. This array of possibilities encourages learners to approach project work more freely and choose from which standpoint to explore it in depth, hence creating more opportunities for interaction and feedback with those teachers and within those areas in which learners show particular interest. Besides, asked what support proved most useful, the teacher under the pseudonym of “Mr. Carl” says: “Conversation, dialogue, and networking with my teaching colleagues have helped me to navigate challenges in learning how to teach online” (Kaden, U., 2020, p. 9).

As Mr. Carl further elaborates on strategies that proved successful, he says that “assignments were interest-driven and utilized the home environment” (Kaden, U., 2020, p. 9). In these specific conditions, project work needs to rely heavily on the immediate environment, which necessarily includes families as direct audience or even indirect participants in school work. Since project work aims for social activism and encourages engagement of a larger community, whether in the exploration stages or during the final product presentation, it is the wider community that projects should be focusing on. Being forced to utilize the home environment and engage community members, even if it sometimes only includes the nuclear family, might easily be a concealed advantage online learning holds for PBL approach.

Another insight from this study that might be useful in PBL settings is an observation of Mr. Carl’s who speculates that “the online environment may allow for voices to be heard without the added social anxiety”, as well as that “the inflexible bell schedule” does not work well for all (Kaden, U., 2020, p. 10). As this study suggests, and the findings of the research study in this paper will further confirm, students “enjoy the freedom to work at their own pace and decide how they want their day to look” (Kaden, U., 2020, p. 10). In their questionnaires, the students involved in the projects presented in this paper mostly shared that they had enjoyed the freedom to tailor the activities to their needs, paces, and interests, and to take active part in shaping the development of the projects while working on the assigned tasks.

The conclusions made by Mr. Carl are very similar to the findings of this study. As explained above, connected learning, interest-driven projects, and learning not based on standards led Mr. Carl to believe that “some of his secondary students might finish the quarantine period having developed valuable new life skills, gained personally relevant knowledge, and take better charge of their own learning” (Kaden, U., 2020, p. 11). The overall feedback and impressions of the teachers involved in the projects presented in this study is in line with this.

Most of them believe that online learning presented some challenges, but also brought numerous benefits that would otherwise be hard to achieve and recreate.

While PBL may not be directly connected to the online learning circumstances, it certainly becomes an important tool that must be further explored and utilized more frequently in the future. The flexibility and multi-dimensional nature it offers may serve the future teachers who, as the study suggests, “must be prepared in their teacher education programs to serve the rapidly growing number of online students and have the pedagogy skills for the blended learning models of the future” (Kaden, U., 2020, pp. 11-12).

A study by König, J., Jäger-Biela, J.D. & Glutsch, N. (2020) addressed the changes in learning and teaching due to COVID-19 pandemic from the viewpoint of the use of information and communication technologies (ICT) in education in general, especially as the switch to online learning made ICT not only a relevant aspect, but rather an essential tool that makes education possible. PBL often aims to address important social issues in order to make learning meaningful. In the process, a key indirect goal of any project is for the learners to acquire problem solving skills in contexts that replicate real-life experiences, hence making learning as authentic as possible. In the context of COVID-19 pandemic, the use of ICT became a tool for creative and innovative problem solving, making project work in ICT and vice-versa a blend that simply makes sense. Of course, the study suggests that teacher competence is crucial for best implementing ICT and that, only due to presence of digital means of teaching and learning, “increased digital literacy competences among students may not yet be guaranteed” (König, J., Jäger-Biela, J.D. & Glutsch, N., 2020, p. 610).

The study (König, J., Jäger-Biela, J.D. & Glutsch, N., 2020, p. 611) further suggests:

Based on Bandura’s (1997) work, teachers’ self-efficacy denotes teachers’ beliefs about their abilities to succeed in specific situations. The extent to which teachers perceive such efficacy may influence whether or not they take action, invest effort in an action, and how long they may sustain possible challenges (Tschannen-Moran and Hoy 2001).

Self-efficacy and adaptive teaching are perceived as key to quality instruction (König et al., 2020) and these comprise essential elements of teacher role in PBL projects. Teachers as mentors, observers, and facilitators in PBL are required to integrate their curricula into an organic process that project work is.

The COVID-19 pandemic crisis urged both individual teachers and entire education systems to rethink approaches to learning and adapt fast to changing circumstances. As demonstrated from the analysis of the above presented studies, PBL and ICT do not obstruct, but rather complement, each other. Furthermore, the COVID-19 pandemic-caused changes have similarities to PBL contexts in general in that they both create environments that are often fast-changing and dynamic and require adaptive teaching in terms of creative and flexible problem-solving every step of the way.

In conclusion, there is no relevant evidence to suggest that PBL is challenged by COVID-19 pandemic circumstances or any other similar contexts to the extent where its functionality and usual learning benefits are not achieved. On the contrary, it is possible that PBL principles can offer constructive solutions to some of the greatest challenges of virtual learning, while, on the other hand, the online model does not necessarily impede the flow and outcomes of PBL work. Moreover, if the two are merged carefully, the results this blend yields might lead to innovative teaching that speaks to the authentic needs of new generations.

4. Research Framework

This section deals primarily with two projects designed to elicit the required research data and describes the approach to the research in detail. It also offers insights from the pilot study, as an integral and crucial step within the action research process.

4.1. Research problem

This research aims to explore the possibilities for meeting the curriculum requirements of English language teaching (ELT) through project-based learning (PBL). Another problem the research aims to examine is the effectiveness of project work in inspiring interdisciplinary teaching and the cross-curricular approach at the institutional level.

4.2. Research methodology

4.2.1. Goals

1. Examine if project work can meet the desired learning outcomes of English language teaching.
2. Compare the knowledge, skills, and values that students acquire through project work and through more traditional, teacher-driven instruction.
3. Examine and define the benefits of project work for interdisciplinary teaching.

4.2.2. Hypotheses

The research results will either confirm or refute the following hypotheses:

H1: Students meet the expected learning outcomes through project-based learning.

H2: Project work helps students develop holistically and acquire more diverse sets of skills than through more traditional teaching.;

H3: Project work encourages interdisciplinary teaching and provides teachers with a solid framework for cross-curricular approaches.

4.2.3. Methods and techniques

This research combines both qualitative and quantitative methods.

Experiment

The projects themselves and the determined learning outcomes/lessons take the form of experiment with one experimental and one control group. The experimental group is provided with the PBL approach, while the control group is offered a more traditional teaching approach.

Survey

Questionnaire → The students were asked to fill in a questionnaire in order to test their perception of the project work and the learners' preferences in comparison with other forms of teaching.

The questionnaire was designed by the author of the thesis following the PBL principles presented and described in detail in the theoretical framework of this paper. The final question in the student questionnaire is based on the *eight key competences* as defined and listed by the “*Recommendation of the European Parliament and of the Council of 18 December 2006 on key competences for lifelong learning*”. The description of these competences are retrieved from the Official (web) Journal of the European Union (*OJ L 394, 30.12.2006, p. 10–18*).

Interview → The teachers involved were asked to undertake an interview which aimed to confirm that project work offers a convenient framework for cross-curricular interdisciplinary teaching.

The interview form was also designed by the author of the thesis following the PBL principles presented and described in detail in the theoretical framework of this paper with the goal of eliciting feedback from teachers that might confirm or challenge the presented principles.

4.2.4. Participants

Standard Approach Group

5 grade V students (1 girl and 4 boys)

10 grade VI students (5 girls and 5 boys)

PBL Approach Group:

5 grade V students (2 girls and 3 boys).

10 grade VI students (6 girls and 4 boys)

Teachers:

The teachers of the following subjects were included in the projects and gave the interviews: a German teacher, a French teacher, a Math teacher, an Art teacher, a Bosnian teacher, a Geography teacher, a History teacher, a primary school teacher with 11 years of experience in a Montessori school, the school psychologist, the author of the thesis

4.3. Project Descriptions

These projects were implemented as part of online schooling between March and June 2020, which was established due to a lockdown caused by the COVID-19 pandemic. The duration of these projects was 2 weeks per project, but the experience was seen as one period of interdisciplinary teaching and learning and the underlying values and goals were observed over the period of one month.

5. Research Data Analysis

5.1. Project Descriptions

Project 1 → Project name: A Mars Colony

For the purposes of the research study, the students were put into two groups: The Standard Approach group and the PBL Approach group. Both groups did the same pretesting, in this case writing an essay on the topic, “A Mars Colony“. The data collected from the first essay was compared against the set criteria in three areas: essay writing, grammar (verb tenses), and vocabulary, in order to meet the expected learning outcomes from the English language curriculum.

The differences in the teaching approaches for these two groups were minor in regards to English lessons themselves. After the pretesting, both groups were provided with vocabulary lists that inspired discussion and brainstorming. Separate lessons were delivered to both groups on essay writing (one 45-minute lesson) and verb tenses (two 45-minute lessons). The lessons were also combined with the follow-up assignments to practice the aforementioned grammatical concepts.

The crucial difference in the teaching approaches in the final stage was that the PBL group was part of the project entitled “A Mars Colony“, within which they worked on a variety of lessons in different subjects. Each lesson was in line with the overarching topic of the colonization of Mars. Also, separate lessons had been delivered before any subject teaching began. Each teacher was assigned a group of students to teach specifically the strategies and steps of project work and to give students the opportunity to ask questions and use the instructions for planning and organization of their time and resources in order to work on the project assignments as independently as possible.

This goal was directly conveyed to children and presented as one of the requirements for the validation of their success in any area.

Criteria

Target Vocabulary:

environment, pollution, global warming, greenhouse effect, rocket, space station, space ship, explore, data, collect, expedition, research, colony, sustainable, planet, conditions, galaxy/galactic, scientists, journey

Areas/lessons:

Essay Writing

Verb Tenses

Vocabulary Expansion

Assessment Criteria:

Essay writing:

Student uses the essay structure properly: the text includes at least 3 paragraphs.

Student makes clear differences between the introductory or lead-in statement, the body, and the conclusion in terms of content and style.

Student demonstrates unity, coherence, and completeness in writing.

Grammar:

Student uses the following verb tenses: present simple, present progressive, present perfect, past simple, past progressive, future simple, future progressive

Student uses all of the tenses.

Student uses most of the tenses.

Student uses some of the tenses.

Student can use the form of a tense properly.

Vocabulary:

Student uses the target vocabulary.

Student uses a variety of target vocabulary words.

*For the complete planning of the shared learning idea see Appendix A1.

Results:

Standard Approach

Criteria	Number of students who met the criteria	
	Pre-testing	Post-testing
Essay Writing		
Student uses the essay structure properly: the text includes at least 3 paragraphs.	4	14
Student makes clear differences between the introductory or lead-in statement, the body, and the conclusion in terms of content and style.	8	12
Student demonstrates unity, coherence, and completeness in writing.	6	12
Grammar (Verb Tenses)		
Goal: Student uses the following verb tenses: present simple, present progressive, present perfect, past simple, past progressive, future simple, future progressive	Pre-testing	Post-testing
Student uses all of the tenses.	0	4
Student uses most of the tenses.	5	8
Student uses some of the tenses.	10	3
Student can use the form of a tense properly.	10	14
Vocabulary		
Student uses the target vocabulary.	8	14
Student uses a variety of target vocabulary words.	1	7

PBL Approach:

Criteria	Number of students who met the criteria	
	Pre-testing	Post-testing
Essay Writing		
Student uses the essay structure properly: the text includes at least 3 paragraphs.	5	14
Student makes clear differences between the introductory or lead-in statement, the body, and the conclusion in terms of content and style.	7	14
Student demonstrates unity, coherence, and completeness in writing.	5	13
Grammar (Verb Tenses)		
Goal: Student uses the following verb tenses: present simple, present progressive, present perfect, past simple, past progressive, future simple, future progressive	Pre-testing	Post-testing
Student uses all of the tenses.	3	10
Student uses most of the tenses.	9	4
Student uses some of the tenses.	3	1
Student can use the form of a tense properly.	10	14
Vocabulary		
Student uses the target vocabulary.	7	15
Student uses a variety of target vocabulary words.	1	13

Analysis and Commentary of Research Results

While the research data shows that essay structure and writing style, as well as the targeted grammar areas are dependent on direct instruction for improvement and implementation in students' work, the vocabulary section offers differing results.

Students can be instructed to use a certain format or follow the requested structure. They can also be taught which verb tenses to use and how to use them. When directly asked to include these components in their essays, both groups managed to do it easily, regardless of the teaching approach.

However, in the vocabulary section, the results show a growth in the topic-related vocabulary that was not targeted and directly taught through English lessons. This is most likely a by-product of project work through which students were exposed to various sources and able to tackle the issues regarding the colonization of Mars from various perspectives, considering science, social, historical, ecological, biological, psychological, linguistic, and artistic aspects, as well as sanitation, infrastructure, entertainment, nutrition, education, politics, and others.

This has all lead to a significant growth in their exposure to a variety of material for viewing and reading. It also allowed them to acquire useful general knowledge and rely on scientific facts for inspiration and creativity.

Project 2 → Project name: Robotics**Project description**

For the purposes of the research study, the students were put into two groups: the Standard Approach group and the PBL Approach group.

Both groups did the same pretesting, in this case a descriptive writing assignment based on a Robot Puzzle. The students were provided with the links to two different robot puzzles. Upon building the puzzles, the students were provided with a list of questions they needed to answer. They were instructed to combine the answers into a coherent piece of text, rather than a list of separate answers.

The differences in the teaching approaches for these two groups were minor in regards to English lessons themselves. After the pretesting, both groups were provided with links to a You Tube video and an internet article containing useful information on robots. Also, separate lessons were delivered to both groups on what elements to include in their descriptions, as well as to trigger discussions and share their current knowledge of robotics (two 45-minute lessons).

The post-testing included a written assignment with the following instructions:

Imagine and describe in detail your own robot. Think about:

→ *Structure (all the necessary parts)*

→ *Engine: What is it powered by? How does it move? (engine, fuel, essential movable parts such as joints, wheels, and alike)*

→ *Purpose: What type of robot is it? What is it made to do? Why do you consider this functionality the most purposeful, the most useful and meaningful?*

→ *Special function: give your robot one super power. Explain why you would want your robot to have it.*

Find out more, get inspired and consider some existing ideas at the following links:

https://www.youtube.com/watch?v=8vIT2da6N_o

<https://robots.ieee.org/learn/types-of-robots/>

The crucial difference in the teaching approaches in the final stage was that the PBL group was part of the project entitled “Robotics“, within which they worked on a variety of lessons in different subjects. Each lesson was in line with the overarching topic of robotics.

Criteria

Target Vocabulary: capability, computer, education, engine, engineering, entertainment, fuel, function, functionality, human, humanoid, industrial, machine, medical, power, purpose structure, technology, type

Areas/lessons:

Descriptive Writing

Vocabulary Expansion

Assessment Criteria:

Descriptive writing:

Student demonstrates unity, coherence, and completeness in writing.

Student uses a number of adjectives for descriptive purposes.

Student uses detailed writing to describe accurately

(so that someone who cannot see it can visualize every detail of a scene or object described).

Student avoids imposing personal opinions.

The writing is on topic, it is effective and relevant.

Student explains technical terms and provides proper contexts for specific terminology.

Vocabulary:

Student uses the target vocabulary.

Student uses a variety of target vocabulary words.

*For the complete interdisciplinary planning of the shared learning idea see Appendix A3.

Research Results:**Standard Approach**

Criteria	Number of students who met the criteria	
	Pre-testing	Post-testing
Descriptive Writing		
Student demonstrates unity, coherence, and completeness in writing.	10	14
Student uses a number of adjectives for descriptive purposes.	10	12
Student uses detailed writing to describe accurately (so that someone who cannot see it can visualize every detail of a scene or object described).	5	10
The writing is on topic, it is effective and relevant.	5	9
Student explains technical terms and provides proper contexts for specific terminology.	2	8
Vocabulary		
Student uses the target vocabulary.	4	12
Student uses a variety of target vocabulary words.	2	6

PBL Approach:

Criteria	Number of students who met the criteria	
	Pre-testing	Post-testing
Descriptive Writing		
Student demonstrates unity, coherence, and completeness in writing.	9	13
Student uses a number of adjectives for descriptive purposes.	11	14
Student uses detailed writing to describe accurately (so that someone who cannot see it can visualize every detail of a scene or object described).	7	12
The writing is on topic, it is effective and relevant.	7	14
Student explains technical terms and provides proper contexts for specific terminology.	4	13
Vocabulary		
Student uses the target vocabulary.	4	15
Student uses a variety of target vocabulary words.	3	14

Analysis and Commentary of Research Results

Similar to the outcomes of the first project, the data collected from the students' work on the second project also shows a significant improvement in their overall knowledge of the topic, which translates to vocabulary expansion in linguistic terms. This once more proved to be the one area in which the PBL approach group showed the greatest progress and seemed to be more successful than the standard approach group. In terms of descriptive writing, both groups made some progress and demonstrated the practiced skills and knowledge in the post-testing. However, the quality of their work was different. The PBL groups seemed to have had more time and opportunities to consider various perspectives and deliver the topic with more expertise. This was seen not only through the use of the specific terminology, but also through their ideas and efforts towards creation and innovation driven by the spark of curiosity that resulted from project-related research.

While there are no clear implications that PBL approach was necessarily more successful than the standard teaching approach, the students' work demonstrates the importance of diverse experiences and learning that is student-driven, rather than teacher-guided and controlled, and allows space and time for exploration setting the final goals in broader terms with various paths a student can follow in order to achieve the goals. This was primarily enabled through the interdisciplinary nature of the teaching approach.

5.2. Student Questionnaires – Data Analysis

The student questionnaire form was designed by the author of the thesis in order to elicit targeted feedback from the research participants. Questions A, B, C, and E offer the participants opportunities to share their feedback in an open-ended manner, encouraging personal, individual, and subjective interpretations. The data elicited were preferences or likes and dislikes (question A), personal interpretation of skills and knowledge acquired (question B), criticism and suggestions for change and improvement resulting from personal experiences (questions C and E). The goal of such open-ended questions was an attempt to display the outcomes of project work that are implied and indirectly result from the structure itself, referred to as “the defining elements of PBL teaching” in section 1.3. of this paper.

Question D aims to put to a test the presence of the elements that make up the skeleton of the PBL approach, i.e. the teachers' success or failure in providing the necessary conditions for a PBL environment (see section 1.4. for more details).

Finally, question F relies on the 8 key competences for lifelong learning, as defined, quoted, and explained in section 1.1 of this paper. The goal of this question was to test the ability of the projects to address and develop these competences in the participants, since lifelong learning skills are amongst the most important indirect objectives of PBL.

The data collected via this questionnaire was analyzed and then grouped as follows:

A) What did you like the most about these two projects?

- the chance to imagine, design and create a Mars colony and a robot model (7 students)
- tasks were interesting and fun, the learning related to the topics was on a deeper level and in more detail than in other lessons (5 students)
- the room for imagination and the freedom to write, design, draw, sketch... (2 students)
- the very idea of creating a Mars colony (1 student)
- the chance to watch a documentary (1 student)
- the chance to create an animation (1 student)
- plenty of time and no pressure (1 student)
- that they included many subjects into one big project (1 student)

→ B) What kind of skills did these two projects help you develop? What did you learn while working on these two projects?

- the acquisition of specific, topic-related knowledge (6 students)
- (re)search skills: how to find useful information online and use different sources (3 students)
- model making skills and the use of different materials (2 students)
- the understanding of the complexity of colonizing Mars, the potential benefits of using robots, the skill of planning and considering different aspects of the situation, taking into account the current issues while planning any future actions (1 student)

- to discuss about these topics with other children (1 student)
- the skill of writing and generating ideas (1 student)
- summarizing and identifying important information from different sources like text and video (1 student)
- analyzing information and using it to solve a problem (1 student)
- reading, analyzing, and writing skills (1 student)
- a significant number of new vocabulary items in English and Bosnian/Croatian/Serbian (BCS) (1 student)
- the elements of a scientific approach to problem-solving (1 student)
- drawing skills (1 student)
- oral and written expression, essay writing skills (1 student)
- time management and planning skills (1 student)

C) Would you change anything about the projects? If yes, what would you change?

Yes: 4 students	No: 20 students
Reasons and additional explanations: I would change the way the tasks were presented in the Mars Colony project (the structure and the schedules). I would prefer doing the projects together with my friends, at school and in groups. (2 students)	Reasons and additional explanations: Some of the comments are listed in the quotes below: <i>“No, I wouldn’t change these projects because they were very fun and I think a replacement would be a mistake.”</i>

D) Think about your work on the projects and answer these questions:

1.) Were you given clear instructions on what to do?

Yes: 18 students	No: 0 students	Yes, most of the time: 6 student
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2.) Were you provided with sources, materials, and information you needed?

Yes: 22 students	No: 0 students	Yes, mostly: 2 student
Reasons and additional explanations: Given the online schooling		

circumstances, the materials were not provided physically, but we were given the choice and suggestions on what to use and how to use our environment creatively (3 students)		
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3.) Were the teachers available for your questions? Did the teachers provide enough guidelines and feedback?

Yes: 22 students	No: 0 students	Yes, most of the time: 2 students
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4.) Was there a product resulting from these two projects? Did you present the results to anyone?

Yes: 17 students	No: 6 students	Not sure: 1 student
Reasons and additional explanations: the Martian home model and the robot model were presented to family members (5 students) the tasks were presented in various ways to the teachers (2 students) an essay and a video (1 student) sharing with other students in video lessons (1 student)	Reasons and additional explanations:	

E) Describe your experience of working on these two projects. Feel free to provide comments and suggestions for improvement.

- interesting, fun/entertaining, useful and very informative (15 students)
- generally good and enjoyable (5 students)
- a bit challenging (6 students)
- different and inspiring – made me curious and excited (5 students)
- made Zoom meetings fun (1 student)

F) To what extent (how much) were the projects useful for developing the following competences? Circle the answer you think best describes your experience:

1. The projects helped me to communicate more easily my thoughts, feelings, and ideas, in both speech and writing, in my first language.

not useful at all	not very useful	useful	very useful	extremely useful
1	2	5	9	2

2. The projects helped me express myself more easily in a foreign language and be able to understand another culture (how other people behave, think, speak, dress up, communicate and so on).

not useful at all	not very useful	useful	very useful	extremely useful
	2	15	2	5

3. The projects helped me understand more about the world around me. The projects allowed me to develop my math skills, my knowledge of nature and technology.

not useful at all	not very useful	useful	very useful	extremely useful
		4	10	10

4. The projects helped me develop the skills for IT (information technology) and taught me how to process information that I found using IT technology.

not useful at all	not very useful	useful	very useful	extremely useful
	3	10	5	6

5. The projects helped me develop learning skills. I learned how to manage my time and organize my learning, either individually or in groups.

not useful at all	not very useful	useful	very useful	extremely useful
		11	3	10

6. The projects helped me connect socially with other students. It helped me learn how to participate in discussions with friends on different topics. It helped us learn how to have constructive discussions even with differing opinions.

not useful at all	not very useful	useful	very useful	extremely useful
	5	4	12	3

7. The projects helped me learn how to turn ideas into action through creativity, innovation and risk taking as well as to plan and manage projects.

not useful at all	not very useful	useful	very useful	extremely useful
		6	6	12

8. The projects helped me learn how to appreciate the creative importance of ideas, experiences and emotions in a range of media such as music, literature and visual and performing arts.

not useful at all	not very useful	useful	very useful	extremely useful
	3	6	9	6

5.3. Teacher Interviews – Data Analysis

The below presented interviews with the teachers involved in the projects were designed by the author of the thesis in order to elicit teachers’ familiarity with and awareness of PBL principles and its wider application in the teaching field.

The teachers’ experiences and feedback are crucial since PBL is not necessarily required by the curricula and it is somewhat neglected in mainstream teaching, as it requires specific conditions. Teachers are those who need to work hard to create and maintain such conditions and it is therefore their professional development that is at the same time a driving force of PBL and its direct result.

The goal of the interviews was to better understand the role of teachers and different dimensions of both challenges and benefits of PBL approach to teaching different subjects.

1. Say your full name and introduce yourself briefly.

→ Participants: staff of the Private Montessori primary school, "Bloom" Sarajevo.

→ Participants’ profiles

a German teacher

a French teacher

a Math teacher

an Art teacher

a Bosnian teacher

a Geography teacher
 a History teacher
 a primary school teacher with 11 years of experience in a Montessori school.
 the school psychologist

2. Do you want your statements from this interview to be quoted anonymously or do you wish to be quoted under your full name in this MA thesis?

- Wish to stay anonymous: 5 interviewees
- Wish to be quoted under the full name:
 - Maja Dedić (the French teacher)
 - Nina Bulajić (the school psychologist)
 - Adela Vilajet Dizdar (the Math teacher)
 - Ismir Delija (the Art teacher)

3. Are you familiar with Project Based Learning (PBL) principles?

Yes: 9 interviewees	No: 0 interviewees
Reasons and additional explanations: → Got familiarized with it through my teaching practice, but only briefly instructed and superficially informed about the methodology while at the university. → In practice yes but in theory not so much.	Reasons and additional explanations:

4. Were the projects you took part in for the purposes of this research your first experiences of project work?

Yes: 6 interviewees	No: 3 interviewees
Reasons and additional explanations:	Reasons and additional explanations: <i>Since I worked in a public school before Bloom, I had some experience in project work, but the full understanding and practical application of the project work actually happened in Bloom.</i>

5. Did you manage to meet the curriculum requirements in your subject through project work?

Yes: 8 interviewees	No: 1 interviewee
Reasons and additional explanations: <i>With multiple adaptations and after creating additional materials, even more was done than what is required by the curriculum (2 interviewees)</i>	Reasons and additional explanations:

<p><i>It best served me for the purposes of revision and putting the previously introduced theoretical principles into practical use.</i></p> <p><i>Yes, and my opinion is that with this way of teaching, every child goes further than just following a curriculum. We can say that students explore a much broader area within a topic by participating in these projects.</i></p>	
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6. Do you think the projects allowed for more interdisciplinary work than it is usually the case in your environment?

Yes: 9 interviewees	No: 0 interviewees
<p>Reasons and additional explanations:</p> <p><i>The possibility for more interdisciplinary work is one of the main advantages of PBL. It allowed me to explore more, gave me additional ideas, made me think of new ways to present the content, and it showed children how all the subjects can be connected.</i></p> <p><i>Not only did it allow for interdisciplinary learning, but it also encouraged the pursue of long term goals and helped the students understand the practical applications of the subject matter introduced. Project work eliminated the ultimate students' question, "How will this be useful to me ever in my life?"</i></p>	<p>Reasons and additional explanations:</p>

7. What do you think are the greatest advantages of project-based learning?

- *Innovation, creativity, the freedom of expression, active learning, the development of a variety of skills*
- *Addressing one overarching topic in different subject areas works to provide a bigger picture to students*
- *New topics get introduced, that usually wouldn't be part of curriculum*
- *It poses an extra challenge for teachers to become more inventive, creative and flexible.*
- *It provides the possibility to observe and approach one topic/problem from different perspectives, to analyze and evaluate the existing ones, but also to offer new, fresh perspectives on concepts. It helps develop critical thinking, encourages creative ideas and allows for practical applications of theoretical knowledge.*
- *It encourages meaningful learning. The knowledge acquired through project work seems to be more long-term than the knowledge acquired traditionally, i.e. through simple memorization.*

→ Project work seems to urge students to be responsible for their own learning and to work independently and on their own initiative, rather than being served a fixed amount of knowledge to acquire by the teacher and constantly guided on how to approach its acquisition and interpretation.

→ Students acquire a deeper understanding of the topic and get the chance to develop a wider range of skills such as critical thinking, communication, collaboration, creativity, and many others.

8. Do you think project work helps students develop holistically and acquire more diverse sets of skills than through more traditional approaches to teaching?

Yes: 9 interviewees	No: 0 interviewees
<p>Reasons and additional explanations: <i>It does not focus only on knowledge acquisition. It requires employment of various other skills.</i> <i>Project work allows for a wider range of educational activity, not only in academic terms, which is the main focus of traditional teaching.</i> <i>In the traditional approaches to teaching we have many subjects that become problems on their own. With this approach, students have more space to develop holistically, learning about a topic from many sides and views.</i></p> <p><i>Students go through the whole process from researching and collecting data, being encouraged to question their discoveries, trying to put in to practice what they discovered, all the way to reflecting on the entire process, not focusing only on the subject matter.</i></p>	<p>Reasons and additional explanations:</p>

9. Was it challenging for you as a teacher and in what ways?

Yes: 9 interviewees	No: 0 interviewees
<p>Reasons and additional explanations: <i>The lack of prior experience, knowledge and training for PBL were my challenges. It is hard to do planning for PBL projects.</i> <i>The need to adapt the existing materials or produce new ones depending on the project topic.</i> <i>My greatest challenge was the lack of any experience in and training for PBL.</i> <i>I needed to prepare the activities in a very</i></p>	<p>Reasons and additional explanations:</p>

<i>short time and I did not have any training in project-based learning.</i>	
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Did you have enough help from your colleagues?

Yes: 9 interviewees	No: 0 interviewees
Reasons and additional explanations: <i>I got inspired mostly through discussing everybody's personal challenges and using their experiences and advice to inform and improve my own practice.</i>	Reasons and additional explanations:

Did this challenge you in new ways?

Yes: 9 interviewees	No: 0 interviewees
Reasons and additional explanations: <i>It required a lot of creativity and innovation. It was necessary that we receive the students' feedback in order to plan and design our approach to project work. Only after the first practical experience could we guide our actions by the students' interests and needs.</i>	Reasons and additional explanations:

Do you think you were informed enough about PBL and trained for project-based teaching?

Yes: 0 interviewees	No: 9 interviewees
Reasons and additional explanations:	Reasons and additional explanations: <i>No prior information. I kept educating myself along the way, as well as learning by doing.</i>

10. Do you have any personal comments or general recommendations regarding PBL?

→ *Young and inexperienced teachers should embrace PBL. It is rather challenging and demanding for teachers and students alike, but it is also highly rewarding and results in long-term knowledge.*

→ *It allows for more freedom in organizing your lessons, more motivation for yourself to get out of your comfort zone and create something new and innovative. It is fun and definitely more inspiring than the traditional approach.*

→ *It is rather demanding in terms of the amount of work and preparation required from teachers, but it is nevertheless an approach that allows students to see a bigger picture and understand the practical, real-life implications of the subject matter better than through standard or mainstream teaching approaches.*

→ *I think it is a right path for education and a refreshing moment for students' learning.*

→ *I believe that PBL is a very useful and important part of teaching, and that it provides an opportunity to influence the overall development of students' abilities. At teacher training colleges and further professional development of educators, special attention should be paid to training teachers about this way of teaching so that as many students as possible have the opportunity to learn through PBL.*

The comments of the school psychologist who closely followed the children's work on these projects:

As a school psychologist, I have to emphasize a positive impact of project work in a holistic aspect of child's development. Through the project work, children went beyond curriculum's expectations, they became more independent, self-confident, perceived learning as a fun process and as an exploration. Since it was an organic process, children had the opportunity to learn about themselves, people around them and to reflect on their work in a very objective manner. The most important thing that happened through project work is the correlation between subjects through which children had the opportunity to apply knowledge in practical ways and to break the traditional concept in which knowledge stays in a "separate box" from the practical application. A lot of interdisciplinary work actually happens spontaneously, which, in my opinion, represents the best way for learning.

Project work puts children in the role of active participants, researchers who learn because they are driven by the passion to learn and discover new things. Teachers are facilitators and observers of the whole process and they don't have a central role in the learning process, as is the case in traditional environments.

PBL empowered teamwork between teachers and connected them in a more cooperative way. They were helping and listening to each other, offering different approaches based on their personal experiences and they reflected a lot. That attitude was then transferred onto children too and the quality of the work teachers received was very high. It just confirmed all the positive aspects of the PBL that I had been aware of.

I think that all curricular reforms that are happening all around the world should be more focused on learning through experiences and from different perspectives (subjects) which can be easily transformed through PBL.

5.4. Data Analysis Summary

The data from both student questionnaires and teacher interviews suggests that project work enables teachers to achieve curriculum goals and allows students to meet the expected learning outcomes, therefore confirming the first hypothesis.

The post-testing tables show that reaching the curriculum and subject goals is equally achievable through project work as well as through other, more traditional, approaches. They also demonstrate, however, certain added value and additional benefits of project work, especially in terms of general knowledge, research skills, and vocabulary expansion.

It is evident that students recognized higher order thinking skills as goals and worked towards achieving them. Their reflections phrased as having the opportunity to “be scientists” or “feeling excited and inspired to explore” prove that they were motivated and challenged in ways other than aiming for achieving lesson goals, the scope of which is usually much narrower than it was the case with the shared learning ideas presented here.

There is evidence in the student questionnaires that project work helped them develop holistically, as they managed to recognize certain skills without being directly instructed to. For example, some of them listed analyzing, summarizing, research, and problem solving skills, without any of these skills being specifically aimed for. The fact that they managed to recognize, employ, and eventually reflect on these skills demonstrates a process that had taken place behind the acquisition of the skills.

The majority of students enjoyed the opportunity to be creative and to take responsibility for their own learning. In addition to that, they managed to reach a point where the learning takes care of itself, it becomes spontaneous. Here is how the Montessori Philosophy module explains this spontaneity in learning:

To support this spontaneous learning we need to acknowledge the close relationship between the child and the favourable environment and the link created by the teacher between the two. To make the favourable environment work for the child we need to acknowledge the importance of the child's independence. It is an essential tool motivating not only the learning process, but life itself. Spontaneous learning will not occur if the child is not free to move, to make choices and to lead his/her own learning. (MCI, 2013, p.57)

It is also worth mentioning that the majority of students recognized the potential of project work to pursue and help acquire the lifelong learning competences retrieved from the Official

(web) Journal of the European Union (*OJ L 394, 30.12.2006, p. 10–18*) and completely listed in the theoretical background section of this paper. As previously described in the introduction to the questionnaire data analysis, the competences were translated into questionnaire questions and the data retrieved suggests that these are mostly present and not only successfully, but also positively interpreted by students as a part of project work.

The above interpretation can, to some extent, confirm the second hypothesis and we can argue that, at least what is evident from the participants' experiences, project work helped both students and teachers develop holistically and acquire various sets of skills, not necessarily targeted by specific subject teaching goals.

The teacher interviews help us confirm the third hypothesis as well, since all the teachers who took part claimed to have had a much different experience teaching with colleagues and seeking cross-curricular correlations between subjects than teaching the usual way, focusing on their individual areas and not making efforts towards making the connections between subjects evident, natural and authentic.

Most teachers managed to see their teaching as much more organic, natural, and logical than it was usually the case. They praised and enjoyed the collaboration with colleagues, which eventually helped them overcome challenges and learn how to guide the children through project activities, but they all expressed their lack of experience and training in project work.

6 Concluding Remarks and Recommendations

A common element found in all the interviews and questionnaires is the value of experience of project work, praised and acknowledged by students and teachers alike. While we certainly cannot consider separate individual experiences we learn from to be equal to a systematically organized and planned out experiential learning opportunities, we still can argue that any learning occasion whatsoever needs to provide learners with memorable experiences that are essential to the creation of synapses, resulting in lifelong learning.

What is factually evident from the results is that children's motivation skyrocketed, as well as their sense of learning for the sake of learning and the overall sense of joy and enthusiasm, not so frequently attached to institutional approaches to learning. Learning itself is an ongoing process that fulfills our existence on so many levels and it is essential for both survival and health, as well as an overall sense of accomplishment and happiness in our lives. However, this is often not the very first association to schools and it is therefore obvious that institutionalized learning has acquired forms that suffocate the organic aspects of learning with its formats and technical requirements. Project work allows for more freedom and spontaneity and therefore offers possibility to have a more flexible approach to subject work that can make learning more natural.

While these projects extended over only a month and were done by a rather small number of participants, they still demonstrate how quality work with a wider overall goal can take place in even a small number of lessons (if we choose to see the timeframe in a certain number of 45-minute lessons) with results and benefits that go beyond average because of the coherence and a greater goal that drives students to enjoy subject work as just one section of the route, not necessarily a destination, and as a tool employed to achieve the final goal. It makes learning compartmentalized in a systematic way; subjects and tasks within subject areas become building blocks, each important and essential in itself, but still part of something bigger. It makes learning organized, not separated and split into individual subject boxes where each lesson is striving towards becoming a complete whole within itself, while in reality, both teachers and students often struggle to make sense of these separate building blocks and manage to store and categorize them properly for future reference.

Apart from the necessary requirements and conditions one needs to provide for project work, there are certain recommendations we can derive from this study that might help guide teachers in implementing project work. When starting a project or becoming part of one, educators should ensure to:

- choose a relevant topic
- adjust their teaching approach (choose activities and content that easily fits into the overall structure and nature of the project itself)
- provide ample support to students at the beginning, but try to stay in the background and let them take over the responsibility for the final outcome
- make instructions and expectations clear, but leave a lot of space for creative freedom
- weave subject work into project work or vice versa, but ensure not to make overly rigid splits between the two, which can further confuse students
- talk to students about the process at the beginning, along the way, and at the end alike

6.1. Useful Observations from the Pilot Projects

The author believes that project work can yield positive outcomes and benefit the participants significantly only if the participants express their willingness to partake, i.e. if their motivation is primarily and for the most part intrinsic. This does not mean that the teacher should not make any efforts other than offering the choice and then proceeding with the training for those students who choose to partake. The teacher needs to encourage the students to think about the topic and the importance of actions taken in such directions, increasing their motivation, raising the awareness and increasing their sensitivity and the sense of social and moral responsibility. This can be done in various and numerous ways, but it is a necessary process that will require time and effort on the side of the teacher. Even if, after an intensive preparation, the teacher eventually faces reluctance by the students, the teacher must show ample understanding for personal interests and acknowledge the students' right to choose. This is, at the end of the day, the essential element of building inner motivation and the will to learn and develop in line with one's own style, pace, and capabilities.

It should also be emphasized that not even the completion of a project is the measure of success. It is, for sure, the ideal cycle, the desired ending, as the participants themselves create a project with a purpose of reaching a set goal and materializing their ideas into a final product meant for display. However, teachers must keep in mind that the very process of project realization is the bridge between the idea and its materialization, and it is exactly this bridge that holds methodical, didactical, experiential, and other learning gems that the participants need to collect as they cross that path towards a set goal. Therefore, the process should be treated as, at least, equally important as the project goal. Even if the goal becomes blurry and seems far-fetched, the participants will still benefit from the process and they will also be able to experience hardships and failures on their way, an experience which, if assisted properly, can actually teach the students valuable life lessons and inspire growth in new directions. When students struggle a lot and even fail is actually the time when most learning takes place.

Nevertheless, there is a great danger for such reasoning to be misunderstood! To sum up, we need to refer back to the theoretical background section where we examined the basic definitions of project work. One author (Grant, 2002) defined the aims of project work as “the creation of a personally meaningful artefact“, therefore placing an emphasis on this final product as something which becomes of personal importance to the students. We cannot deny the importance of the completion and of keeping the integrity of a project by persevering and staying determined to reach the goal and materialize one’s ideas. We must not assume that our participants will be satisfied with our preaching about the significance of the process and participation, and expect them to forget about achieving any palpable real results. While keeping in mind that all the learning gems are hidden behind the process, we must ask ourselves: would we be willing or even able (as reason-guided, intelligent beings) to admire a bridge completely detached from both shores, beginning only a step away from one shore and ending only a step away from the other, losing its purpose and becoming a meaningless landscape ornament? This is how we can and must encourage our learners too to endure and persevere in their efforts towards completing project work.

6.2. Disadvantages and weak points of the research

The first and foremost weak point of the study is a rather small number of participants. However, due to the specific circumstances and the fact that the study was conducted in a private school with a lesser overall number of students per grade than the usual state standard, this aspect could be expected and is the direct consequence of the setting itself. Another unique feature of the setting is the vertical grouping of students which results in a diversity across ages and levels that is hardly ever seen in the usual traditional settings. While this presents itself as a difficulty in terms of curricula and language proficiency across grades, it is also a rather refreshing difference that makes this educational setting much more natural, genuinely focused on the individual approach that inevitably results in as many different learning and teaching curves as the number of students involved.

While one can argue that project work is flexible and universally applicable in various contexts and settings, there is still the need to emphasize the specific circumstances in which this research study was conducted. The project work was done between March and June 2020, during the online schooling imposed on us by the consequences of the COVID-19 pandemic. On one hand, these circumstances allowed for more frequent uses of technology and diversified the learning by moving away not only from textbooks and usual methodologies, but also from school routines and the physical environment that can sometimes impede the freedom of movement and access to places and people often needed in project and research work.

Another specific aspect of this research and its design is its interdisciplinary nature. A number of different teachers worked on their respective curricula-based lessons and found different ways to weave their approaches into a common effort towards a shared goal. How one teacher's teaching affects the students' general knowledge of the topic can hardly be measured in terms of its reception and further application across various fields, i.e. subjects. However, there is probably more than meets the eye in such cross-curricular efforts and this is confirmed by multiple studies (Fragoulis, 2009). Furthermore, authentic activities were designed in each subject aiming to provide tasks with real world relevance and utility, "that integrate across the curriculum, that provide appropriate levels of complexity, and that allow students to select appropriate levels of difficulty or involvement" (Jonassen, 1991), as quoted in Herrington et al, 2003).

7. Suggested project ideas

This section offers detailed project ideas for three different projects that can easily be implemented and conducted in the above described environment and those similar to it. We will offer suggestions for structural organization and practical implications for three projects: The City Model Project, My Dictionary Project, and Peace Education Project.

Project Setup

The students are assigned to two groups (to be referred to as Group 1 and Group 2) with roughly the same number of boys and girls per group to avoid any potential gender-based discrepancies influencing the results.

Group 1 follows the approach based on the PBL principles, while Group 2 is offered other approaches, depending on the teacher involved. The teachers participating in these projects are asked to retain their usual approach. A more detailed description of the organization of the work inside the groups and the corresponding teaching approaches are as follows:

→ **Group 1 (the PBL approach):** The teacher would first describe the idea to the students, then ask the students for suggestions, then prepare and execute the planned activities together with the students. A mandatory part of this is for the students to be driving the teaching process, to practice peer teaching, and to work on the project lesson as if preparing a presentational lesson for an audience. This might as well be included, as the children can eventually teach the lessons (once they practiced enough and feel comfortable) to groups of older or younger students, as well as to parents and/or teachers. The teacher acting as a facilitator of the process is both a pillar of the Montessori philosophy and a crucial part of any PBL process. It is due to such elements that the Montessori approach offers a convenient environment for performing PBL practices.

→ **Group 2 (the traditional approach):** In the second group, the students are asked to listen to a teacher delivering the lesson and to take notes. The students are given a textbook or a worksheet with the lesson content. The students are afterwards tested (in both written and oral forms) in order to demonstrate their knowledge on the subject.

*NOTE: The same test sheet is used for both pre-testing and post-testing as this should elicit the data of any progress made. The impressions and opinions of the students can be collected by the means of a questionnaire.

Project descriptions

I → The City Model

The initial stages of this project will include skills and knowledge usually addressed through subjects like mathematics, technical education, and art. The children will start making a city model by cutting the city blocks to the previously defined dimension out of styrofoam, measuring and doing calculations in the process. In a Montessori environment, tools and art supplies are displayed on the corresponding shelves in a proper order and selected to fit the age and skill levels of the children. It is what Maria Montessori called “the prepared environment” - a place where a child can reach his/her full potential (MCI, 2013, p. 43). Therefore, we might say that the very setting of a prepared Montessori environment provides all the necessary conditions and strongly encourages project work. This, however, refers only to the middle stage, the process of carrying out the necessary steps towards the realization of the project idea. What is crucial to understand is that project work does not require only an environment prepared in such a way, so that once the tools and materials are given to children they will create something. The children will most certainly create something. However, their creation is not previously planned out, then followed by a number of systematically organized steps in carrying out the set plan, the goal of all this being the final product that corresponds and witnesses to this systematic planning, careful execution, and its faithful final representation as its end result.

Therefore, the work on the City Model starts with planning, drawing, discussions, and alike. The first practical part includes making the blocks and other gross landscape features (planning for mountains, rivers, bridges, airports, train stations). The children might decide to make some specific areas of the city (such as a skate park, or a stadium) and they will be encouraged to do so. To meet the needs of one of the project ideas (using the model for teaching English), the students will be given a task of building a bus station, making bus stops around the city, naming the bus lines, assigning the numbers to buses and so on. Only such tasks will be given out as command cards, i.e. as the teacher-designed tasks. Otherwise, the children will be given the creative space and freedom to organize and decorate their city as they see fit. Taking the above mentioned into consideration, we understand that the students will face various challenges as they work on building the model. It is easy to notice the variety of skills the learners will need to carry out such a project. Therefore, the learners will undoubtedly benefit in a number of ways. There are three different lessons connected to the model project:

1. Civil Engineers (correlation: English, Mathematics, Technical Education)
2. Global Warming (correlation: English, My Environment, Culture of Living)
3. City Life (correlation: English, Bosnian, German, French)

Each lesson is designed so to reflect the structure of the project work: defining the project task, planning, carrying out the project, and delivering the presentation. However, there is one final product that permeates all the segments: the City Model Project Manual, a small notebook that serves as a portfolio for all the project-related work that the students use to document their ideas and work, as well as to try to visually represent some of the hands-on work on the model. The Manual can be presented to the public in order for the audience to acquire insights into the scope of the project and understand the amount of work, time, and effort invested.

The following section offers the step-by-step descriptions of these lessons.

City Model Lessons:

1. Civil Engineers (correlation: English, Mathematics, Technical Education, Art)

Learning outcomes: The students will use the measuring tape to measure the blocks and determine the desired dimensions. The students will do various calculations including simple operations such as addition, subtraction, division, and multiplication. The students will write down the results and collect the measurements in the project manual. The students will use cutting and measuring tools. The students will paint the blocks and do spatial planning. The students will engage in discussions and make plans for all the steps, including the work distribution (the tasks should be assigned to students according to their personal interests, skills, and abilities).

Final product: The city blocks are cut to the set dimensions, the basic layout of the streets is defined and painted on the blocks. Green areas for parks, grey areas for parking lots, and other areas are also painted on the blocks. The blocks are ready for placing objects on them (the blocks are numerated, their purposes and positions are determined).

Project structure:

GROUP 1: The teacher gathers the students to explain the project goals. The students take notes in their Manual – they write down their “planning“ and they are asked to discuss the ways to approach the task. The teacher offers the following chart for the students to organize their activities:

What are the tasks we must complete?	What can each group member do (job division)?	What materials do we need (where can we find them)?	How much time do we need?	The questions we have for the teacher:

The teacher also provides a simple command card with a list of tasks:

1. Measure the original blocks. Write down their dimensions.
2. Cut the blocks to this dimension: 30cm x 30 cm
3. Paint the roads on each block so each street is 10 cm wide.
4. Calculate how to place the crossroads in the center of the block.
5. Measure and write down all the other available areas, so that you can plan for the dimensions of the buildings you will place on those surfaces later on.

GROUP 2: The teacher designs the tasks that include all the operations and activities that the project group deals with. The only difference is that the teacher does not use the blocks or any other concrete materials to do meaningful hands-on work. The teacher gives instructions, explains the operations, asks the learners to do the calculations and measuring (again, using an item with no specific purpose). After the instruction and practice, the teacher delivers a test for learners to demonstrate their knowledge.

The tasks for Group 2 are delivered in the form of problems, such as:

1. A wall is 30m long. If a window that is 10m wide was placed in the middle of the wall, how much of the wall would remain on each side of the window?

2. How much do you need to take away from the length of a piece of wood that is 45cm long to make it 30cm long?

The vocabulary will be delivered in the form of vocabulary cards containing:

city, mayor, block, council, engineer, architect, construction worker

2. Global Warming (correlation: English, My Environment, Culture of Living, Music, Art)

Learning outcomes: The students will be able to explain the concept of global warming and describe the process in detail referring to the cause-and-effect chain leading to global warming. The students will be able to elaborate on concepts such as: pollution, greenhouse effect, and ecology.

Final product: A short presentation/demonstration explaining the abovementioned concepts and how they correlate in the overall process of global warming. The students will use the model and their acquired knowledge to make simulations using various materials and substances to recreate the natural processes in an educational presentation in front of an audience (of either parents, teachers, or, ideally, their peers). The aim of this presentation is explaining and describing the process of global warming.

Project structure:

GROUP 1: The teacher provides a short introduction on the meaning of pollution. The teacher asks the students to make a list of all types of pollution they are familiar with. The students are asked to form groups and write short texts about how each type of pollution occurs, what consequences it has for the environment, and how it can be prevented. The students are asked to draw/visually represent the types of pollution they choose to write about.

The teacher then provides videos, power-point presentations, pictures, texts, and other content and provides the learners with explanations and instruction on the pollution processes. The teacher works on the vocabulary and ensures that all the learners are familiar with the vocabulary used and then moves on to describing the concepts behind the

vocabulary. The students are given opportunities for asking questions and giving comments. The teacher does not require the students, at any given point, to answer any of the questions in order to evaluate their knowledge. The students are given the choice of how much they want to contribute to the discussions.

After the initial exploration of the topic, the students are asked to think of ways to represent the related concepts on the model. For example, the teacher encourages the students to build factories, cars, trash, but also to create (if they do not yet exist) the surfaces to be polluted, such as forests, rivers, lakes, etc. Next, the students are encouraged to think how to produce smoke, represent the greenhouse effect (the sun, the gases, the ozone) and finally to demonstrate the consequences of global warming. In cooperation with the music teacher, the students can think of ways to produce sound effects to accompany the visual component of the simulation (the sounds of cars, machines, or factories). At this point the teacher can introduce the concept of white pollution (light and sound pollution). Once the students manage to create their version of the simulation process, the teacher asks them to practice presenting the process using the theoretical background from the exploration stage. The students start preparing the plan for the presentation. They make roles and lines, consider the props, and practice performing in front of the teacher. The final step includes delivering the presentation to an audience (peers, teachers, parents).

GROUP 2:

The teacher delivers a lesson on global warming and uses all the same available sources as mentioned above (videos, power-point presentations, pictures, texts, and other content). The students are asked to repeat, write down, and later reproduce the knowledge. They are asked to complete a test after the lesson.

*NOTE: The previously presented chart and the Project Manual notebook can be universally implemented as project tools in all the activities. Also, it is possible that certain stages of some projects will require very specific instructions and materials and the teacher's duty is to recognize the learners' needs and provide the necessary material. The custom-made materials especially adapted to the needs emerging from the project are the most precious and to learners probably highly beneficial learning tools. They require a significant amount of flexibility and devotion, as well as time and effort on the teacher's side, but the outcomes are usually at least as rewarding as the efforts made. The teacher cannot plan in advance for all

the potential materials that will prove necessary in the course of the project, but this is exactly the role of the project mediator and facilitator: to observe, notice, adapt, modify, adjust, and assist the flow of the process in such a way that this is hardly noticed by the learners or by the observers from outside. As encouraged by the Montessori philosophy, the teacher should “follow the child“, but “help the child to help himself“, while always staying in the background, making his/her presence “invisible“ and allowing the children to take the learning in the direction they want, to adapt it to their own pace and style, and to finally drive the learning process. There is a difference between student-centered and student-driven approaches. Actually, as educators, we should see our work as student-centered at any given time. However, we often tend to take over and control the learning process completely, as there is a natural human tendency to be in control in order to feel empowered and secure. The Montessori approach advocates the opposite of complete control, it encourages the letting go of control and trusting the child's inner drive and innate human tendencies for exploration and learning to drive the process naturally. Exercising such a philosophy is highly recommended, beneficial, if not necessary, for success in project work.

3. City Life (English)

Learning outcomes: The students will be able to explain how to reach a destination within a city, i.e. the students will be able to give clear instructions on how to arrive from point A to point B. The students will practice giving directions and information about public transportation. The students will describe several buildings or city areas (using a number of adjectives) as orientation landmarks for tourists or visitors. The students will role-play the scenes, therefore finding themselves both in the role of a “local“, the person giving the instructions, and the visitor/tourist, the person asking for information.

The learning outcomes for group 1 might slightly differ from those for group 2, since the students from group 1 will work on the very organization of the city blocks, the position of the buildings, the bus lines, stops, numbers, the street names, and therefore this process might include more beneficial group work and employ other skills and knowledge.

Final product: The students will practice short role-play scenes with several different settings. The students will write the lines, compile them into a script, and act out the scenes.

Project structure:

GROUP 1: The teacher explains the aims of the project: to determine the positions of the buildings, to name the neighborhoods and streets, to plan for a bus station and bus stops, to create bus lines and make bus schedules, and anything else the students might suggest. The teacher provides the students with authentic materials (bus schedules and city maps), then asks them to organize meetings (acting as “city councilors”) and agree on a good plan for meeting these aims. The students then come to the teacher (“the city mayor”) to get the plans approved. This kind of role-play will require more dialogue and more diplomatic, formal conversation. It will hopefully enrich the students’ vocabulary and educate them about the ways in which they can be active citizens (appropriate ways of addressing an institution, etc). The students can also be split into two groups, one of which represents the citizens, while the other acts as a city council. They both receive their tasks in the form of cards and they need to file complaints, respond to them, inform the mayor and make requests. The city life revolves in such a way.

GROUP 2: This group will be provided with picture dictionary pages for learning the vocabulary, followed by the revision part including crosswords, word-searches, and similar other materials for vocabulary practice and reinforcement. Giving directions will be practiced by repetition, listening exercises, demonstration, pictures, and animations. The instruction given to this group will not be related to the model, but rather tested through a vocabulary quiz.

Some of the target vocabulary is listed below:

left, right, forward, backward, go _____, turn _____, take a _____ turn, go to _____ (street), take the bus number _____, walk (_____), the bus number _____ goes to the _____ neighborhood where the _____ (building) is located, go past, take the second turn, it's the building on the left, across the street

The model group will also be encouraged to explore the politics vocabulary, such as: *council, councilor, citizen, board, meeting, consent, file a complaint, grass roots, delegate, vote, majority, consensus, formal letter, election, democracy, etc.*

Picture 1: The map



The map (see picture 1) is an example of a worksheet that can be used for instruction in both groups, especially to replace the model for the learners in group 2.

The teacher's role:

Since the separate lessons within this project include also several different subject-teachers acting as the project leaders for the corresponding lessons, we refer to the teacher's role as more general and more focused on the interdisciplinary nature of this approach. This means that the teachers cooperate and consult one another in order to facilitate the learning process for the students. As the project designer, the author of the thesis, presented the lessons to the colleagues and worked with them on building their personal approaches to teaching, this was primarily the work of the subject-teachers, rather than the solitary effort of the project designer. The author only ensured that the principles of project work were followed by other teachers as well. The success of this project rests on the ability and willingness of the teachers to cooperate. Therefore, a substantial amount of communication and co-teaching is required.

II → My Dictionary Project

The main topic: English: building vocabulary and reinforcing grammar

Possible Correlations: B/C/S (Bosnian/Croatian/Serbian), French/German, My Environment, Music, Art

*In this case, the correlations with other subjects will appear spontaneously, as the Dictionary Project is designed to follow the individual learner's pace and to actually respond to the needs of a given student at a given point. This makes it hard to determine all the existing correlations, since the school work in all subjects in Bloom is done in English, therefore making English the learners' primary tool for knowledge acquisition and content interpretation in general. This can yield a multitude of different individual challenges. However, the project will also have other, more general and universally applied goals, therefore giving it a certain structure (described in detail in the Project structure section below) within which the space for flexibility and individual adaptations will be provided.

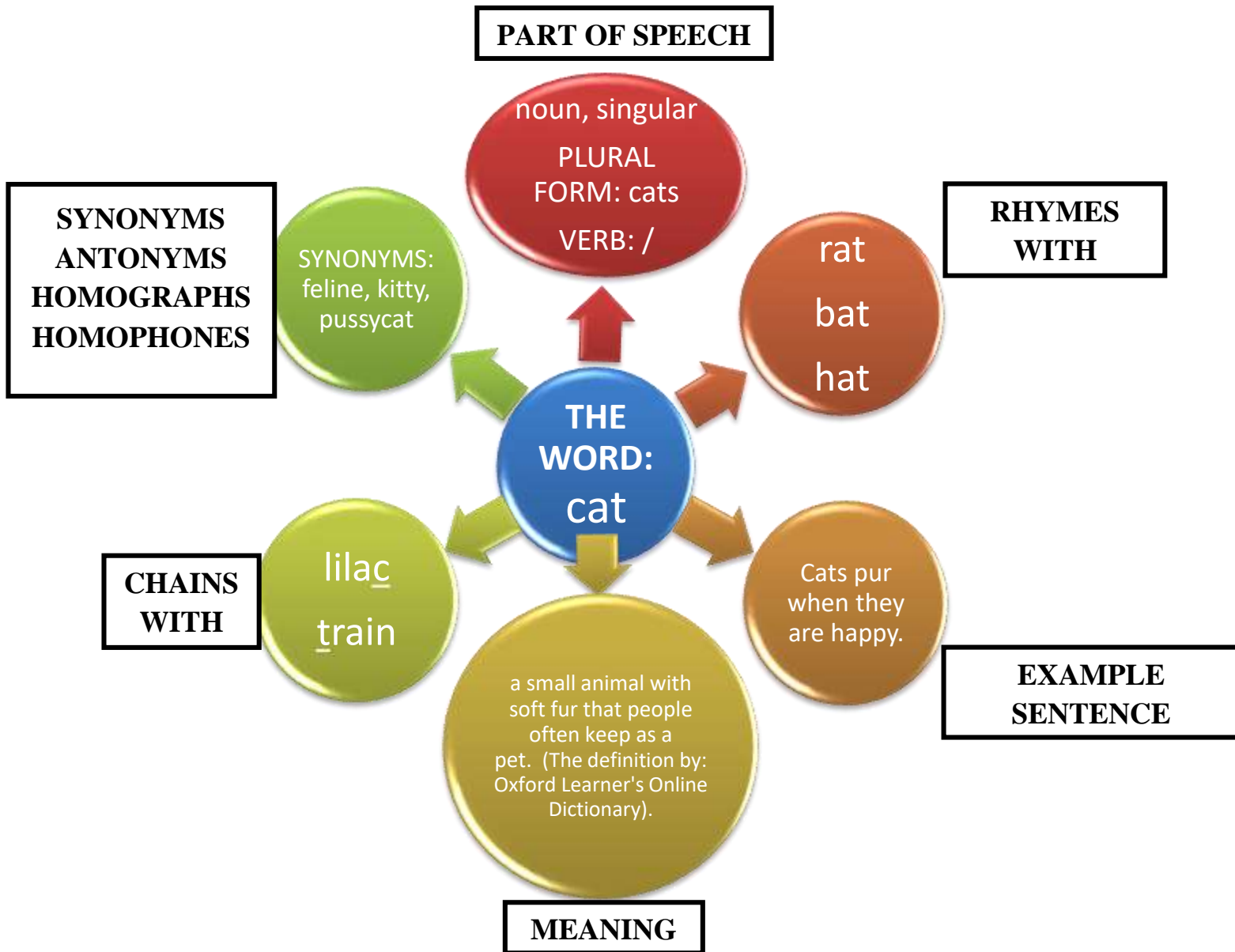
Learning outcomes: improve their own dictionary skills (alphabetizing, learning about dictionary meta-language and symbols), help other students use dictionaries, explore online dictionaries and work on both single word definitions, but also learn about idioms, sayings and expressions, multiple-meaning words, homonyms, poetic devices, etc. They will do research on the meaning and origin of some idioms, as well as try to find their counterparts in other languages (they speak), enrich their vocabulary in language and other areas.

Final product: The students will make lists of words in their dictionary notebooks, but they will also produce spider charts/mind maps and other graphic representations of vocabulary, help organize and take part in the language olympics. The students will also present their spider charts and *one word – one world* mind maps to other students and act as peer teachers or presenters.

One word – one world mind map is specifically designed for the needs of this project and it will be presented to each student as one of the project assignments, but also as a learning tool, a framework within which the learners can set goals and work on them independently. Every mind map should be unique and this kind of creativity should be encouraged by allowing the

learners to choose visual ways of presenting information. The *one word – one world* mind map only provides the inner structure, the set of dots that the student can then connect in his/her own way.

An outline of the *one word-one world* map is provided below:



Picture 2: *One word-one world* mind map

Students can choose to include more branches to display information that is special to their word or that is the result of their research or personal interest. This can also be a stage in

one's development. Given that a student has made progress and acquired the skills of working with certain categories, they may wish to challenge themselves and bring their research to a higher level. This should be done step by step and the teacher's task is to facilitate this process.

Students can also choose to include less or tend to select certain categories they would like to revisit with each new word. All these approaches and others should be welcomed by the teacher, since this will result in learners creating personalized systems that best suit their interests and abilities. For those who choose to expand their research, some of the options might be: translations into other languages they learn or speak; combines with (compound words, such as *catfish*), the appearance of that word as a metaphor within an expression or an idiom, but it can also be a general section called “other interesting facts“, where the students can choose to include anything else they find out about that word, as dictionaries often offer several interesting pieces of information. This way the students can deepened their research on and, hopefully, their interest for the word as such. These creative endeavors serve to encourage searching for the sake of enjoying learning and discovering, entering the world of words just to get to know it better, not necessarily to find out the most obvious information about a word and not even scratch the surface of its linguistic environment.

Project structure:

Stage 1: Practicing dictionary skills, grammar introduction

The teacher introduces the project, presents the My Dictionary notebooks and assigns the notebooks to each student. The teacher uses several examples to demonstrate how to make inputs in the dictionary notebooks. The teacher also gives basic instructions (to each student individually) on how to use dictionaries (both hard copies and online dictionaries).

The students are given series of tasks (4-5 words per week) to start with basic word searching and to simply practice their dictionary skills. In a parallel manner the students are also instructed on grammar and they learn about parts of speech both through dictionary lessons and grammar lessons. Once they are ready to include parts of speech in their analysis

of each word, the teacher asks the students to make their dictionary inputs in such ways. Consider the following example:

the word: limit

noun form: limit
plural form: limits

verb form: (to) limit
present simple: limit
past simple: limited
future simple: will limit

adjective form: limited

Stage 2: Mind mapping

In order for the mind-mapping to start, the students need to explore other categories and features of words (such as synonyms, antonyms, homonyms), as well as poetic devices, expressions and idioms, the games such as Word Chain, etc.

Once the students are familiar and feel comfortable with several categories, they are provided with examples and explained the basics of mind-mapping. They are encouraged to develop their own unique styles and to choose the content they would like to work with. They start practicing with less categories, slowly progressing with time and expanding their mind maps.

Stage 3: Start making the one word-one world map

Once the students feel comfortable with making mind maps, they are challenged to find a word that can satisfy the greatest number of categories and to make a *one word-one world* mind map that is to be presented to an audience. The students are given enough time and supported in the process.

Stage 4: Mind map presentation

The students present their mind maps both as an artwork and a linguistic graph that shows the result of a careful research of a word's linguistic environment. During this presentation, the students refer to everything they have learned about all the categories and explain the content and the connections to their listeners.

The students' knowledge is tested through word searches, crosswords, and short quizzes before the project starts and after it finishes.

GROUP 1: The students in this group follow the process (as described in the section above) thoroughly and work towards the goal of *one word-one world* mind maps.

GROUP 2: The students in this group are not encouraged to make their mind maps, but they receive the necessary instruction on all the skills as the students from group 1. Instead of

working on mind maps, their knowledge is tested only via word searches, crosswords, and short quizzes.

The teacher's role:

The role of the teacher in this project is to provide ample input of information and instructions on how to access and use different sources of information and to enable learners the tools and time to practice working with them. The teacher should also provide solid instruction in grammar, so that students have enough background knowledge to combine with their search in order to make it fruitful.

The most challenging part of the teacher's work in this project is to recognize what the learners are ready for and what might be too challenging for them and to systematically and slowly introduce different categories, teach different skills, enabling the learners to form and expand their mind maps as they progress. It is also very much possible that the students will need instruction on the very concept of mind mapping, as well as time to practice and develop the skill.

III → Peace Education Project (NVCPD)

The main topic: Non-violent communication, peace education

Correlation: English, Ethics and World Religions, History

Learning outcomes: The students will be able to notice, recognize, differentiate, and react to 9 different types of violence. The students will have practical, real-life opportunities to apply their knowledge to make informed educated judgments about violent behavior, to prevent or report violence and to act as peacemakers within their school environment. The students will produce several written assignments on the topic.

Final product: NVCPD training certificate, NVCPD duty report, NVCPD reflection paper and its public presentation → These papers can take forms of oral presentations for the students who choose to present them to an audience and become peace ambassadors, peace educators, and peace makers. A desired final product which can hardly be empirically tested is actually a better future world where our NVCPD officers will practice what they now preach as 4th grade students, a world where more people will live peace as a moral

imperative for every human person individually, not as a more or less important choice that a very small group of powerful individuals opt to make on the behalf of millions of people.

Project Structure: The teacher delivers several lessons/workshops on the significance of peace and non-violent communication using pictures, videos, power point presentations, animations, worksheets, and other materials in order to offer the students a good basis for understanding the topic. The teacher refers to the names of several world-famous peacemakers such as Mahatma Gandhi, Martin Luther King Junior, Rosa Parks, Malala Yousafzai, and others. The students learn about their life works and philosophies, and they discuss the importance of their actions for our world of today and our future.

The teacher then presents the Non-violent Communication Police Department (NVCPD) training course that includes 4 steps: NVCPD training sheet (1*), NVCPD duty (2*), NVCPD report (3*), and NVCPD reflection (4*).

The training sheet can be found in the appendix section under the „Appendix 5“. After completing the training sheet (1*), the student becomes an NVCPD officer. His/her duties include noticing and reporting any forms of violence happening in the classroom or at the recess time throughout the school day (which in the P.O.Š. Bloom includes 8 hours → 8 a.m. – 16 p.m.) for the period of one week (2*). The officers are not allowed to use physical force to prevent violence (even if they deal with physical violence), as this is not ethical, safe, supported by the principles of NVC, nor in line with school regulations. The actions the officers take should be submitted to the teacher in the written form and they comprise the NVCPD duty report file (3*). The final piece includes the NVCP reflection (4*): the students are encouraged to describe their complete NVCPD experience and to write in a form and style of a public speech, so that it can be presented to an audience.

A minor difference between this project idea and the previous two is that the number of participants per group is not fixed or determined by the teacher or any other external factor. The sole criterion used in forming the project group is the students' willingness to participate. Therefore, the group 1 in this case was formed solely according to the students' choice of partaking. It is essential for any project leader to understand the importance of such an approach and to be able to relate its elements to the overall characteristics of project work in order to achieve an optimum balance between the quality and quantity markers of a project at hand. This issue is discussed in detail in the final section, under “Useful Observations and Remarks”. Here we will only offer a short review of the project structure for both groups:

GROUP 1: The volunteers who chose to undertake the NVCPD course are assigned the abovementioned four tasks in the following order and timeframes:

1. NVCPD training – the completion of the training sheet requires one week (5 school days). The candidates were required to submit the sheet on the fifth day by latest. If necessary, the candidates were also asked to revise and modify their work.

2. The NVCPD Duty takes place within 5 school days and revolves in the manner described above. The official start of the duty is designated by the pledge that each officer takes before the classroom of more than 50 P2 students. The teacher constantly monitors the behavior of the officer(s) and asks for oral feedback and report on their actions from both the officers themselves and other students they interact with or those who observe and report their behavior while on duty. This helps both the officers and the civilians understand the concept of social and moral responsibility and the importance of a badge as a symbol of one's duties towards the community.

3. After Week 2 (the duty week), the student is given one more week to write and submit the duty report and the reflection sheet.

4. Since the reflection encompasses the preparation of an oral presentation that might result in a complex project (involving media, technology, art, etc.), the student can be given extra time (another week) to prepare the presentation. Ideally, the four-week period of NVCPD work ends with the final presentation of an officer's work to an audience of teachers, peers, and/or parents.

GROUP 2: While the students in the first group will undergo the whole process as described above, the students in group 2 will be provided with the same educational material that is part of the NVCPD training and with additional materials if necessary. The only difference is that group 2 will address the same issues through a more traditional approach including lectures and presentations, but with no practical work or opportunities to apply the knowledge and skills in their environment. After a substantial amount of practice, the students' knowledge on the topic will be tested in a rather traditional way. While the students for group 1 will undergo this same testing, it is important to notice that the project group will also have the opportunity to demonstrate their knowledge in a variety of ways, as well as to make accounts of their personal experiences and active involvement regarding the learning

process. In their case, the learning included the aspect of values more explicitly than the approach taken with the second group.

The teacher's role:

The teacher's role in this project (except from the general universal ones discussed already in the theoretical background section) are very concrete. This project requires the teacher to always be at hand and available for the learners as they will come across terminology and concepts that might be too challenging for their age level or language skills. During the NVCPD training, the teacher needs to ensure the learners pursue the right tasks and understand the tasks properly. The crucial point is the duty period. While a student performs the duty of the NVCPD officer, the teacher needs to maintain constant communication with both the officer and the other students. This is essential because the student needs to be constantly reminded of his obligations and responsibility to perform the duties assigned. Depending on the level of commitment of the student, this will be different from case to case. In general, the teacher should be interested in the officer's day and ask about the situations he/she faced, offer help, ask for short oral reports, therefore encouraging the process of reflection helping the student to create or simply bring to consciousness the much needed material for the following assignments (the duty report and the final reflection paper). Also, the teacher acts almost like a researcher who needs to feel the response of other students and receive their comments on the officer's work. Children at the age of 9-11 have the tendency to see justice as black and white, and to blindly but strongly fight for „the right thing.” This often leads them to the teacher and they willingly report someone's actions if they do not consider them fair or if they are aware that some of the rules were broken by such actions.

If the teacher is continuously involved and genuinely interested in the officer's actions (but also careful not to become too involved and eventually take over), all the surrounding experiences will present themselves to the teacher. It only requires active and empathetic involvement. Since the children might face difficult situations and react emotionally or even experience significant changes in their own personalities and undergo psychologically sensitive processes, the teacher must act as a caring and loving adult ready to support the child in various aspects, not just those related to academic subject-related knowledge.

APPENDICES:

Appendix A1: The complete shared learning idea for Project 1, “A Mars Colony”

<p>Shared Learning Project Idea</p>	<p>A Mars Colony 1 – Ws 28 and 29</p>
<p>Shared Learning Goals</p>	<p>The child will acquire a broader understanding of project work and understand the basic concepts of project-based learning. They will develop independence and learning-to-learn skills through the process of summarizing, keeping notes, using the resources and extracting useful information, organizing both space and time and all the other aspects of how to approach a task systematically and benefit from its interdisciplinary nature. The child will familiarize themselves with research skills and strategies, focusing on finding and using resources in an efficient and appropriate manner according to scholarly standards and principles.</p> <p>The child will broaden their horizons and translate the acquired knowledge based on scientific facts and their own research findings into various forms of creative expression using different formats, depending on the subject matter (language, art, natural sciences, practical life, etc.).</p>
<p>Activity</p>	<p>Activity 1</p> <p>Make a model of your house on Mars</p> <p>Think:</p> <ul style="list-style-type: none"> - what is needed for comfortable and functional housing - keep in mind the conditions on Mars when designing your house - be creative when using materials, you can use paper, cardboard, plastic <p>Activity 2</p> <p>Task 1: Describe the house you built, explain what is there and why</p> <p>Task 2: Underline prepositions in your text</p> <p>Task 3: Underline adjectives in your text</p> <p>Task 4: Looking at your house model write 20 words and then translate</p>

them into Bosnian

Activity 3

Task 1: Establish your colony: Take into consideration natural resources you have on Mars that enables you to establish your colony. Name your colony. Organize the way of life of the people in your colony. Suggest a social organization according to previously acquired knowledge about social structure in the ancient times. Suggest a system by which your community is ruled (the form of government) according to previously acquired knowledge about forms of government in ancient Greece. Support your choice by providing valid arguments why you chose a specific social organization and the form of government for your colony. Provide a short written response of minimum 10 sentences.

Task 2: Design a floor plan of the main city or village of your colony: Draw a floor plan on A4 paper, including the important buildings and at least 3 historical monuments. Invent the story of each monument and write it down.

Task 3: The Leader/s of your colony: Create the figure of the Leader of the Colony. This figure has to be a combination of at least 4 different historically significant figures. Support your choice by providing valid arguments on why you chose which figure and in what way exactly that figure contributes to the creation of the Supreme Leader. Pay close attention to virtues you would like that your leader has, as well as values that you would like she/he promotes to the people of the colony. Provide a short written response of minimum 10 sentences.

NOTE: Suggest how to avoid bad examples from history and which events we can learn from in order to develop and become an advanced civilization and a better, more humane society.

NOTE: Find attached a PDF material for the activity on Google Classroom in the “Shared Learning topic - A Mars Colony Ws 28 and 29”

Activity 4

Task 1 Study living conditions on Mars

- a) Read the word worksheet about Mars
- b) Answer the questions about Mars

Task 2 Explore the past, present and future exploration of planet Mars

	<p>a) Take notes and write short summary about each period of Mars exploration</p> <p>b) Make a timeline of Mars exploration program</p> <p>NOTE: Find attached a WORD material for the activity on Google Classroom in the “Shared Learning topic - A Mars Colony Ws 28 and 29”</p> <p>Activity 5</p> <p><u>TYPE 1:</u></p> <p>Find the pdf file entitled “Planets - Comparatives and Superlatives” attached within the assignment on Google Classroom. Do the activities on page 2 and submit. Then practice reading and work on the vocabulary with your teacher.</p> <p><u>TYPE 2:</u> Write a story about creating a Mars Colony: Your story needs to have three parts:</p> <ol style="list-style-type: none"> 1. INTRODUCTION (talk about PAST - What your life on Earth looked like) 2. MAIN PART (talk about PRESENT - Let’s say you did your research on the quality of life on Mars and now you know what it’s. Compare and contrast life on Earth to life on Mars: Life on Earth is _____, There you can/can’t____, We like to _____, We always____, We never____, There is a lot of_____ there is not much____, We have/don’t have____, We want to____, we eat____, We go____, We sleep_____ <p>Life on Mars is _____ AND ALL OF THE ABOVE GOES HERE TOO</p> <ol style="list-style-type: none"> 3. CONCLUSION (talk about FUTURE): what will happen once on Mars and what your colony will be doing in the following months <p><u>TYPE 3:</u> Write an essay about the endeavor of creating a Mars Colony.</p> <p>Organize your writing in five paragraphs following this structure.</p> <p>INTRODUCTION (one small paragraph) MAIN PART – split into three paragraphs CONCLUSION (one small paragraph)</p> <p>Use the following tenses. NOTE: <u>This is mandatory and must be followed literally:</u></p> <ol style="list-style-type: none"> 1. INTRODUCTION: PRESENT PERFECT TENSE... Humans have lived on Earth for around _____ years now. Life on Earth has been _____ Humans have _____
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2. MAIN PART 1: PAST SIMPLE

(What it **looked** like in the distant past and what we learned from it)

3. MAIN PART 2: PRESENT SIMPLE

Talk about some general characteristics of our life, of us as human beings and some things that constantly repeat themselves. Use **always, never, every once in a while, we tend to___, we are___, we do___, we don't ___** OR **humans do/are/don't/tend to/want/can or can't....** etc.

4. MAIN PART 3: PRESENT CONTINUOUS/PRESENT PROGRESSIVE

Talk about: How you **are preparing** for the trip to Mars... what kind of activities are **being performed**. What people **are saying/thinking/feeling**. OR YOU CAN TAKE THIS PART TO THE MOMENT WHERE YOU HAVE ALREADY ARRIVED AND SLOWLY STARTING TO DISCOVER LIFE THERE: How the nation **is changing** at the moment and **adapting** to life on Mars. What kind of activities **are taking place** as we speak in order to make life on Mars possible.

5. CONCLUSION: FUTURE SIMPLE AND FUTURE CONTINUOUS

Talk about: what **will be/happen** once on Mars and what your colony **will be doing** in the following months

Activity 6

TYPE 1:

Inside the orbit of Jupiter, our solar system has five large objects; four of these are the planets Mercury, Venus, Earth and Mars. The fifth object is our own moon! These objects are almost perfectly round, but they are not all the same size.

From the clues below, can you figure out just how large the diameter of the planet Mars is in kilometers?

Clue 1 – Mercury is $\frac{7}{5}$ the diameter of the Moon.

Clue 2 – The Moon is $\frac{7}{26}$ the diameter of Earth

Clue 3 – Mars is 68/49 the diameter of Mercury

Clue 4 – The diameter of Earth is 13,000 kilometers.

TYPE 2:

Some of the planets in our solar system are much bigger than Earth while others are smaller. You will explore their sizes.

Task 1: The diameter of Mars is around two times smaller than the diameter of Earth. The diameter of Earth is 13 000 km. If the diameter of Mars was exactly two times smaller than the diameter of Earth, how big would it be?

Task 2: The diameter of Dwarf Planet Pluto is three times smaller than the diameter of Mars. How large is the diameter of Dwarf Planet Pluto?

Task 3: What is the difference between diameters of Mars and Earth ?

TYPE 3:

The actual diameters of the planets, in kilometers, are as follows

Mercury 4,900 km	Jupiter 143,000 km
Venus 12,000 km	Saturn 120,000 km
Earth 13,000 km	Uranus 51,000 km
Mars 6,800 km	Neptune 50,000 km

Task 1: Which planet has the largest diameter ?

Task 2: Which planet has the smallest diameter?

Task 3: Find the difference between the largest diameter and the smallest diameter.

Activity 7

Task 1 Revision

Review the lessons about Spring, Photosynthesis and Parts of the Plant

Play the quiz at the link:

<https://wordwall.net/hr/resource/1248367/spring>

Choose 5 questions to answer! Answer the questions using complete sentences. Write your answers down in your notebook, take photos of them and upload it to Google Classroom.

Task 2**The structure of the plant on Mars**

Your task is to imagine what a plant / flower on Mars would look like.

- Is it possible for Mars to grow some other kinds of flowers? Which ones?
- What does the Mars plant look like and what is it made of?
- What would be all the needs of plants on Mars?
- If photosynthesis is required for the growth of a plant on Earth, then what will be on Mars then?
- Draw a 'new species' of the plant with all its parts.

Activity 8**Task 1****Urban development**

We know that we live in a functional environment where nothing is missing.

- Explore what a city needs to be functional. Make a list of all those necessities.
- Is this possible in a city on Mars? Why, why not?
- What should that city have for a more functional living?
- I wish there was water in that city, but what if there were no rivers on Mars, how would you manage your water supply? Your task is to find a solution.

Think slowly and write the organization of a city on Mars, what that city should have for you to live there.

Write using these questions, or if you feel the need to draw something, feel free to consider all the options.

Activity 9

Task 1: Life on Mars without human colony: Make a drawing or a painting based on your imagination of Mars life now, without a colony of humans. What do you think it looks like? Are there any intelligent life forms or something else? Think about the colors and shapes of the environment and possible life forms. You can use any technique you like,

but it would be nice to colorize the work. Have fun!

Task 2: Life on Mars with human colony: How do you imagine life on Mars after human colonization? Make a drawing or a painting of relations between previous life forms and humans. Are there any changes in shapes and colors? Are there any mutations when life from 2 planets collide? What is the influence they have on each other? You can use any technique you like, but it would be nice to colorize the work. Have fun!

Activity 10

Zoom meeting discussion: What would be the arguments for or against the colonization of Mars?

Friday, 17 April: 9.30 - 10.00 group 1

10.15 - 10.45 group 2

11.00 - 11.30 group 3

Activity 11

Grüße vom Mars (Greetings from Mars)

Write a postcard about your life on Mars.

Instructions:

1. Write to a person (it can be your friend, cousin, even a pet) about your everyday life on Mars. You can use verbs: leben (to live), sein-Ich bin (I am) etc.
2. Describe the weather and the colors you see.
 - a. Example: Das Wetter ist... (The weather is...)
 - b. Ich sehe... (I see...)
3. Answer: What do you eat on Mars?
Example: Ich esse... (I eat...)
4. Answer: What do you wear on Mars?
Example: Ich trage... (I wear...)
5. Do you have a pet on Mars?
Example: Ich habe... (I have...)

	<p>6. Use the example below as a guideline.</p> <p>NOTE: You do not need to use facts. Use your imagination.</p> <p>Example:</p> <p>Lieber Ben,</p> <p>ich bin auf dem Mars. Hier ist alles sehr rot. Das Wetter ist schön und es ist warm. Manchmal ist es kalt. Ich trage dann einen Schal, eine Jacke und Handschuhe.</p> <p>Hier gibt es keine Tiere. Mein Hund ist auf der Erde. Ich besuche ihn bald. Ich esse viel Obst und Gemüse. Hier gibt es viele Erdbeeren und Äpfel. Ich esse auch Nudeln mit Tomatensoße und Käse. Das ist eine Spezialität auf Mars. Zum Nachtsch gibt es immer viel Schokolade. Mars ist super!</p> <p>Wie geht es dir? Kommst du mich besuchen?</p> <p>Liebe Grüße,</p> <p>dein Freund Joe</p> <p>Activity 12</p> <p>Task 1</p> <ul style="list-style-type: none"> • Answer the questions: <p>How do I create a PowerPoint presentation?</p> <p>For example:</p> <p>Step 1: Open Microsoft PowerPoint.</p> <p>Step 2: Go to File at the top of the screen and click New. A box that says “New Presentation” should appear on the right side of your screen</p> <p>Step 3.....</p> <p>What do you mean by slide?</p> <p>What is the difference between presentation and slide?</p> <p>Task 2 Make a presentation about Mars</p> <p>Engage your imagination and make a presentation about Mars.</p> <p>The presentation should include the following elements:</p>
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	<ul style="list-style-type: none"> ● the name of the presentation ● your name and surname ● what the presentation is all about ● pictures ● turn on the animations ● content presented in bullet points, not chunks of text on slides ● the final slide where you convey a message that you want your reader to receive; use this slide to express your opinion on the topic
<p>Resources</p>	<p><u>GENERAL RESOURCES:</u></p> <p>Use these for research, data collection, as well as artistic inspiration and creativity boosts.</p> <p>https://interestingengineering.com/what-would-a-martian-colony-look-like https://mars.nasa.gov/#red_planet/2</p> <p>https://solarsystem.nasa.gov/planets/mars/overview/</p> <p>https://mars.nasa.gov/mars-exploration/timeline/</p> <p>https://spaceplace.nasa.gov/all-about-mars/en/</p> <p>https://www.space.com/how-feed-one-million-mars-colonists.html</p> <p>https://www.youtube.com/watch?v=JaimO7nvzzQ</p> <p>https://www.youtube.com/watch?v=H7zD-8gre4k</p> <p>https://www.youtube.com/watch?v=LCuZC-CRg4M</p> <p><u>SPECIFIC, TASK-RELATED, RESOURCES:</u></p> <p>for Activity 3: PDF materials (Social structure of Ancient Times, The forms of government in Ancient Greece, Ancient Egyptian Historical Figures, Ancient Greek Historical Figures, internet link for valid encyclopedias and websites)</p> <p>for Activity 4:</p> <p>Word Worksheet All about Mars and Exploration of Mars</p> <p>https://mars.nasa.gov/#red_planet/2</p> <p>https://solarsystem.nasa.gov/planets/mars/overview/</p> <p>https://mars.nasa.gov/mars-exploration/timeline/</p>

	<p>https://mars.nasa.gov/#red_planet/5</p> <p>https://spaceplace.nasa.gov/all-about-mars/en/</p> <p>for Activity 5:</p> <ul style="list-style-type: none"> - type 1: the pdf entitled “Planets - Comparatives and Superlatives” - type 2 and type 3: the pdf entitled “A Mars Colony - Activity 5 Resources (types 2 and 3)” <p>for Activity 7:</p> <p>https://wordwall.net/hr/resource/1248367/spring</p>
<p>Expected Outcomes</p>	<p>The students will expand their knowledge of the Solar System as a whole, as well as deepen their knowledge of its constituent elements.</p> <p>The child will identify, analyze, and visualize recurring themes in ancient times history, and apply contextual knowledge in the given context. The child will identify, define, and implement the qualities of good leadership and create a public persona that would embody these.</p> <p>The child will learn how to express ideas in reference to different times of events and how to combine pieces of text into an integral and comprehensive piece of writing in the essay form.</p> <p>The child will expand vocabulary by doing research on the specific subject matter and using the collected data for creative expression.</p> <p>The child will develop creative vision and nurture their imagination through scientific exploration. The child will learn how to contextualize their factual knowledge in artistic representation of a given topic.</p> <p>The child will understand and learn that there are different types of plants and that some of them may thrive in different soil. The child will understand that the growth of the plant requires certain external environmental conditions.</p> <p>The child will understand and learn that the development of a city requires certain functional conditions necessary for humans to live a quality life and secure their safe existence, including social organization and forms of government.</p> <p>The child will develop the ability to think critically and make informed decisions based on collected data and reasoning.</p> <p>The child will develop awareness of the moral and ethical aspects of colonization.</p>

Appendix A2 → Comments and observations on student work from Project 1

This section offers an insight into 4 student essays from the body of post-testing work done by the PBL approach group. The aim of presenting them is to demonstrate the presence of certain learning outcomes that were recorded in these essays, but not originally aimed for.

As we analyze each essay, we will consider some of its specific features that are directly related to project work and therefore demonstrate certain benefits it had for these students' work:

Example 1Activity 5 type 3

Humans have lived on Earth for around 200,000 years now. Life on Earth has been fun, interesting, and a learning experience for all. Humans have caused global warming on Earth, which is not good for any living species.

Earth was way more beautiful before, it used to have healthy oceans and many animals that are now extinct, but we are still fighting for the well being of Earth. We have learned from our experience on Earth, we have learned to recycle, to avoid producing greenhouse effects, to use eco friendly materials, and so on.

In our lives as humans we tend to use a lot of plastic which is not good for the environment. We do use cars in our everyday lives which produces a lot of pollution. Humans are very determined when they want to be. We can't keep up this act, we must change our actions and help save planet Earth.

We are preparing for the trip to Mars. we are packing what we will need, setting up the rocket, setting up devices for contact with the space station, and waiting for the best time to take off. People are feeling nervous and excited. They are saying that they can't wait to visit Mars. They are thinking about all the things they will see there.

When we get to Mars we will go outside and explore. In the following months my colony will be learning data about Mars, collecting soil, rocks, and dust to bring back to Earth. The colony will also be exploring the conditions on Mars, the frozen ice caps, and what it would take to live on Mars!

Comment 1:

This student's work is exemplary and it could be taken as the role model for other students in terms of meeting all the criteria and providing not just basics, but also quality and originality, within a rather concise amount of text.

Example 2: not available in typed form

Comment 2:

This student was inspired to offer a reflection on human kind's collective mentality throughout its history of wars and exploration and to do an analysis of human tendencies, habits, reoccurring patterns in human activity, especially in terms of their interaction with the planet and the resulting consequences.

His essay can be a good wake-up call for people to understand the colonization of Mars as only a consequence of our own irresponsible behavior here on Earth and to take action towards preventing further detrimental activity.

Example 3:

THE ENDEAVOR OF CREATING A MARS COLONY

1. INTRODUCTION: PRESENT PERFECT TENSE

I have created a Mars Colony project in few stages, and after I have completed most of my work I could not have shared it with you. I have learned how to prepare for such a big project which is interconnected. It has been a long process and I have enjoyed the journey so far.

2. MAIN PART 1: PAST SIMPLE

I read a lot about Mars before I designed the first drawing about the colony. I learned about the weather conditions. Based on the facts about conditions on Mars I thought of the materials that I used for my 3D model of the house. I named my colony Olympus Mons, because Olympus Mons is the biggest mountain in our Solar System and it is found on Mars

3. MAIN PART 2: PRESENT SIMPLE

I think of my colony as a sustainable Biome that is as comfortable as a real house on Earth. We humans like our luxuries, good food, nice weather, sport centers, shops and toy stores. We tend to enjoy nice interior with a big windows and a lot of light and plants. We tend to not like stairs so I put escalators on two floors to connect dining area, sleeping area and roof terrace.

4. MAIN PART 3: PRESENT CONTINUOUS/PRESENT PROGRESSIVE

We are in the process of landing to Mars. Scientists are discovering new facts about Mars every day. It is

so exciting to live in the Olympus Mons community. When I look through the hexagon shaped windows I

see a beautiful red and orange landscape and galactic sky with more stars than you can ever imagine to

see. Sometimes when we talk about the Earth we badly miss going outdoors to the sea side and

paddling in the boat and feeling the sunshine on the bare skin. We miss fresh air too even do the plants

in the Biome garden produce fresh clean air,

5. CONCLUSION: FUTURE SIMPLE AND FUTURE CONTINUOUS

We will ensure that life will go uninterrupted in our colony and that we shall be working continuously to

sustain normal living conditions. We will be creating more Biomes for specific purposes and to create

more space for new generations to come and visit us and maybe stay.

I enjoyed this project because I was able to envision life on another planet.

Comment 3:

This student managed to intertwine his own reflections on the research he had done for the purposes of the project with the topic. He described the process and gave us useful insights into student perception of such work and their ability to consider various elements of project work. This particular student was rather successful in his understanding and application of different soft skills fostered by the project approach.

While he managed to meet the criteria and write about the topic, therefore managing to realize the expected learning outcomes, it seems that he also underwent a learning process through which he understood the essentials of PBL and implemented them through his work without having been directly taught these principles.

Example 4: not available in typed form

Comment 4:

This students' essay is brimming with scientific facts and vocabulary that goes significantly beyond the target requirements. It demonstrates depth and breadth of research done by the student while working on the project.

It is very informative and has an aura of a scholarly article rather than a piece of creative writing done in a common English class. It strikes the reader as impressive and shows expertise to the extent where the only features that help us assign the authorship to a 5th grade student are the handwriting and the number and type of spelling errors.

Appendix A3: The complete shared learning idea for Project 2, “Robotics”

Shared Learning Idea	Robotics
Shared Learning Goals	<ul style="list-style-type: none"> • The child will acquire a broader understanding of project work and understand the basic concepts of project-based learning. They will develop independence and learning-to-learn skills through the process of summarizing, keeping notes, using the resources and extracting useful information, organizing both space and time and all the other aspects of how to approach a task systematically and benefit from its interdisciplinary nature. The child will familiarize themselves with research skills and strategies, focusing on finding and using resources in an efficient and appropriate manner according to scholarly standards and principles. • The child will broaden their horizons and translate the acquired knowledge based on scientific facts and their own research findings into various forms of creative expression using different formats, depending on the subject matter (language, art, natural sciences, practical life, etc.). • The child will enrich their linguistic expression in topics related to robotics and learn to apply it in a real-life context.
Activity	<ul style="list-style-type: none"> • Watch the suggested video and create a timeline of the history of robotics • Design your own robot, draw it and write his/her story • Install the graphical programming software mBlock • Math in the IT world: how they are connected. • “Moja priča o robotu” • Moj intervju sa robotom • Read articles and watch videos. Extract useful information and write it down in both passive and active voices using the given prompts.
Resources	<ul style="list-style-type: none"> • See Google classroom assignments
Expected Outcomes	<ul style="list-style-type: none"> • Orientation in time • Sequencing • Identifying main ideas • Improving creative skills • Improving writing skills • Logical thinking • Improve IT knowledge • Getting knowledge about how Math can be applied in the IT world. • The child will expand their vocabulary and general knowledge of robotics. • The child will accurately provide passive and active counterparts of the ideas based on the read material.

Appendix A4 - The parental consents

University of Sarajevo
Faculty of Philosophy
English Department
Teaching Program

MASTER'S THESIS

The Role of English Language Teaching in Project Based Learning:

Exploring Cross-curricular Possibilities for Project Based Learning
on the Example of a Montessori School

Mentor: doc. dr. Larisa Kasumagić-Kafedžić
2556/2016)

Student: Adnan Korman (V,

Project description:

P2 English teacher, Adnan Korman, is preparing to perform several project activities for the purposes of the research component of his MA Thesis (the title is provided above). The projects are designed so as to become part of the children's weekly assignments and therefore included in their planning in cooperation with other P2 and subject teachers. These activities will make up only a small part of the children's usual schoolwork and will, by no means, collide with any of their scheduled activities or recess time.

Parental Consent Form:

By signing this consent form I, here undersigned, agree that my child, _____, take part in all the project activities related to this research. I agree that my child's drawings and writings, as well as oral presentations, be used for the purposes of this research. I understand that my child's participation is anonymous. I understand that the activities related to this research are adapted to the environment and age of my child, that they are specifically designed for the Bloom environment and the Montessori approach (of following the child's needs, decisions, and choices), and as such will be integrated into my child's curriculum. Hereby I give my consent that my child participates in the aforementioned projects.

The parents' or legal guardians' names:
signatures:

The parents' or legal guardians'

1) _____

1) _____

2) _____

2) _____

Appendix A5: Student Questionnaire

RESEARCH PAPER

The Role of English Language Teaching in Project-Based Learning:

Exploring Cross-Curricular Possibilities for Project-Based Learning
on the Example of a Montessori School

Parental Consent Form:

By signing this consent form I, here undersigned, agree that my child, _____, take part in this research. I agree that my child’s drawings and writings, as well as oral presentations, be used for the purposes of this research. I understand that my child’s participation is anonymous and voluntary.

The parents’ or legal guardians’ names:
signatures:

1) _____
2) _____

The parents’ or legal guardians’

1) _____
2) _____

The aim of this questionnaire is to help us assess some of the projects we were working on during the online schooling period and improve our approach to similar tasks in the future. Your answers will help us learn more about both advantages and disadvantages of these projects. Please answer the following questions only in regards to your work on “A Mars Colony” and “Robotics” projects.

Thank you for your participation!

A) What did you like the most about these two projects?

B) What kind of skills did these two projects help you develop? What did you learn while working on these two projects?

C) Would you change anything about the projects? If yes, what would you change?

D) Think about your work on the projects and answer these questions:

1.) Were you given clear instructions on what to do?

2.) Were you provided with sources, materials, and information you needed?

3.) Were the teachers available for your questions? Did the teachers provide enough guidelines and feedback?

4.) Was there a product resulting from these two projects? Did you present the results to anyone?

E) Describe your experience of working on these two projects. Feel free to provide comments and suggestions for improvement.

F) To what extent (how much) were the projects useful for developing the following competences? Circle the answer you think best describes your experience:

1. The projects helped me to communicate more easily my thoughts, feelings, and ideas, in both speech and writing, in my first language.

not useful at all	not very useful	useful	very useful	extremely useful
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2. The projects helped me express myself more easily in a foreign language and be able to understand another culture (how other people behave, think, speak, dress up, communicate and so on).

not useful at all	not very useful	useful	very useful	extremely useful
-------------------	-----------------	--------	-------------	------------------

3. The projects helped me understand more about the world around me. The projects allowed me to develop my math skills, my knowledge of nature and technology.

not useful at all	not very useful	useful	very useful	extremely useful
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4. The projects helped me develop the skills for IT (information technology) and taught me how to process information that I found using IT technology.

not useful at all	not very useful	useful	very useful	extremely useful
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5. The projects helped me develop learning skills. I learned how to manage my time and organize my learning, either individually or in groups.

not useful at all	not very useful	useful	very useful	extremely useful
-------------------	-----------------	--------	-------------	------------------

6. The projects helped me connect socially with other students. It helped me learn how to participate in discussions with friends on different topics. It helped us learn how to have constructive discussions even with differing opinions.

not useful at all	not very useful	useful	very useful	extremely useful
-------------------	-----------------	--------	-------------	------------------

7. The projects helped me learn how to turn ideas into action through creativity, innovation and risk taking as well as to plan and manage projects.

not useful at all	not very useful	useful	very useful	extremely useful
-------------------	-----------------	--------	-------------	------------------

8. The projects helped me learn how to appreciate the creative importance of ideas, experiences and emotions in a range of media such as music, literature and visual and performing arts.

not useful at all	not very useful	useful	very useful	extremely useful
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Thank you for your participation!

Appendix A6 - The teacher interview consent form and protocol

University of Sarajevo
Faculty of Philosophy
English Department
Teaching Program

MASTER'S THESIS

The Role of English Language Teaching in Project Based Learning:

Exploring Cross-curricular Possibilities for Project Based Learning
on the Example of a Montessori School

Mentor: doc. dr. Larisa Kasumagić-Kafedžić
2556/2016)

Student: Adnan Korman (V,

Interview consent form:

By signing this consent form I agree to take part in this interview and I allow that parts of my statements or my full statements be transcribed and used for the purposes of this research. I understand that I can choose to make my participation anonymous, as well as demand that my statements be quoted under my full name. My participation is my free choice and I understand I can stop this interview at any time and require that the collected data be dismissed.

The participant's name: _____

The interviewer's name:

The participant's signature: _____

The interviewer's signature:

Interview protocol:

1. Say your full name and introduce yourself briefly.
2. Do you want your statements from this interview to be quoted anonymously or do you wish to be quoted under your full name in this MA thesis?
3. Are you familiar with Project Based Learning (PBL) principles?
4. Were the projects you took part in for the purposes of this research your first experiences of project work?

5. Did you manage to meet the curriculum requirements in your subject through project work?
6. Do you think the project allowed for more interdisciplinary work than it is usually the case in your environment?
7. What do you think are the greatest advantages of project-based learning?
8. Do you think project work helps students develop holistically and acquire more diverse sets of skills than through more traditional approaches to teaching?
9. Was it challenging for you as a teacher and in what ways? Did you have enough help from your colleagues? Did this challenge you in new ways? Do you think you were informed enough about PBL and trained for project-based teaching?
10. Do you have any personal comments or general recommendations regarding PBL?

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