

**Teacher perceptions of project-based learning in a Kazakh-Turkish Lyceum in  
the northern part of Kazakhstan**

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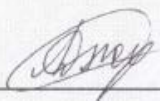
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**NUGSE Research Approval Decision Letter**

Dear Aidyn,

The NUGSE Research Committee reviewed the project entitled "Teacher perceptions about project based learning (PBL) in Kazakh-Turkish Lyceum in Kazakhstan" and decided:

To grant approval for this study subject to minor changes, to be discussed with supervisor

**Approval subject to minor changes:** The study is approved subject to minor changes.

Reviewers' Comments:

**Anonymity:** There seems to be some inconsistency between the assurances of anonymity and the sentence in the interview protocol that, "The school administration will think of the effective methods and ways of overcoming the identified challenges in using PBL". It would be useful if you could explain more clearly exactly what information will be provided to the school administration and how this information will be provided.

**Risks:** See earlier comment about data to school administration. Also, if the researcher actually works in this school, the issue of researcher position in relation to the participants and data also needs to be addressed.

See previous comment. If the researcher is a member of school staff, and especially if the researcher is a member of the school administration, there may be more than minimal risk (real or perceived) to participants. If this is not the case, this point can be disregarded.

Before starting your data collection, you need to discuss these changes with your supervisor, revise your proposal accordingly, and then ask your supervisor to check the revised proposal.

Sincerely,  
NUGSE Research Committee

**Dedication**

I dedicate this thesis to my loving mother, Raushan Kulbayevna and to my careful brother, Shalkar Intykbekov.

### **Acknowledgements**

I would like to say thanks to my supervisor Dilrabo Jonbekova who supported me all along my journey. Thanks to all professors who taught me during these two years. Special thanks to Deborah Brown, Alfred Burns, Dinara Mukhamejanova, Kuralay Bozymbekova, and Philip Montgomery for their enormous help in academic English. Finally I want to thank my Mom and Shalkar who always believe in me and support me.

### **Abstract**

*Problem Statement.* Project-based learning (PBL) is a student-centered teaching approach that organizes learning around projects. It increases students' motivation to learn and prepares them for the 21<sup>st</sup> century demands through developing real-world experience. Many scholars have investigated teacher perceptions regarding PBL, its benefits and challenges; however, no similar research was conducted in Kazakhstan and it remains unclear how Kazakhstani teachers understand PBL. This study attempts to fill in the existing gap of knowledge and practice in Kazakhstan.

*Purpose of study.* The purpose of this study is to explore secondary school teachers' perceptions about project-based learning, its benefits and challenges.

*Methods.* It is a qualitative case study. The sample consists of 4 teachers (male) who teach Chemistry, Computer Science, English language, and Physics in a Kazakh-Turkish Lyceum in the northern part of Kazakhstan. Semi-structured interviews were conducted with participants. The collected data was coded and analyzed using thematic analysis.

*Findings.* The study revealed that the participant teachers perceive PBL as a beneficial teaching approach that has the potential to increase student engagement and help them understand more deeply the subject content through self-learning and learning by doing. The advantages of using PBL discussed by the participants were improved teacher-student and student-student relationships, skill development and real-world practice. The study also identified the challenges the participant teachers have to cope with such as: lack of time, lack of knowledge, and group work problems.

*Conclusions.* The results of this research show that teachers understand PBL from both positive and negative perspectives through its perceived benefits and implementation

challenges. It is considered that findings of this study would improve students' motivations and equip teachers with necessary skills to successfully implement PBL.

*Key words:* project-based learning, benefits, challenges, teachers, students.

### **Аннотация**

*Описание проблемы.* Метод проектов является подходом к обучению через проекты, которые направлены на учащегося. Этот подход повышает интерес учащихся к обучению и с помощью реальной практики реализует их подготовку к требованиям 21 века.

Было проведено много исследований о восприятии этого метода учителями, но представления Казахских учителей об этом методе, его положительных и отрицательных сторонах не были изучены. Остается неясным как воспринимают этот метод Казахские учителя. С целью восполнения пробелов в знаниях и практике Казахстана, была необходимость провести соответствующее исследование.

*Цель работы.* Цель моей работы – изучить представления Казахских учителей о методе проектов, его положительных и отрицательных сторонах.

*Методология.* Я использовал качественное тематическое исследование. Выборка состоит из 4 учителей (мужского пола), преподающих физику, химию, информатику, и английский язык в одном из Казахско-Турецких Лицеев в северной части Казахстана. Мной было использовано частично структурированное интервью.

Собранные данные были закодированы и анализированы с помощью тематического анализа.



*Результаты.* Данные указывают на то, что учителя представляют метод проектов в положительном свете, делая акцент на потенциал этого метода повышать интерес учащихся к обучению и способствовать более глубокому пониманию учебного материала с помощью самообучения и обучения через практику. Были перечислены положительные стороны метода, такие как улучшение взаимоотношений между учащимися, между учителем и учащимися, а также развитие навыков и всемирный опыт. Учителя указали также такие отрицательные стороны этого подхода, как нехватка времени и знаний о методе, и проблемы групповой работы.

*Выводы.* Результаты выявили, что учителя воспринимают метод проектов, как в положительном, так и в отрицательном свете, выделяя многочисленные вышеперечисленные преимущества и недостатки этого метода. Важно отметить то, что результаты этой работы могут быть полезными для повышения интереса учащихся к обучению и снабжения учителей необходимыми навыками для успешного использования метода проектов.

*Ключевые слова:* метод проектов, преимущества, недостатки, учителя, учащиеся.

### **Аңдатпа**

*Мәселенің сипаттамасы.* Жобаға негізделген оқыту әдісі оқушыларды жобалар арқылы оқыту тәсілі болып табылады. Бұл тәсіл оқушылардың оқуға деген қызығушылығын арттыра отырып, олардың 21 ғасырдың талаптарына сай дайын болуларына үлесін қосады. Мұғалімдердің бұл әдіс туралы көзқарастары жайында көптеген зерттеулер жүргізілді, алайда бұл әдіс бойынша Қазақстан мұғалімдерінің көзқарастары, оның оң және теріс аспектілері зерттелген емес. Қазақстандық мұғалімдердің осы әдісті қалай қабылдайтыны түсініксіз болып қалады. Сондықтан,

Қазақстанның білімі мен тәжірибеде олқылықтарын толтыру мақсатында, зерттеу жүргізу қажеттілігі туындайды.

*Жұмыс мақсаты.* Жұмысымның мақсаты – жобаға негізделген оқыту әдісі, оның жағымды және жағымсыз жақтары жайында Қазақстан мұғалімдерінің көзқарастарын зерттеу.

*Әдістемесі.* Мен сапалы іс зерттеу әдісін қолдандым. Үлгісі Қазақстанның солтүстік бөлігіндегі Қазақ-Түрік Лицейлерінің бірінде физика, химия, информатика және ағылшын тілі пәндерін сабақ беретін 4 (ер) мұғалімнен тұрады. Мен ішінара құрылымдық сұхбат түрін пайдаландым. Жиналған деректер кодталған және өзекті талдау арқылы талдау жасалынды.

*Нәтиже.* Мәліметтер бойынша, мұғалімдер жобаға негізделген оқыту әдісіне оң көзқараспен қарап, осы әдістің оқуға оқышулардың қызығушылығын арттыруын және өз бетімен оқу, практика арқылы оқу материалдарын тереңірек түсінуін жағдай жасайтынына акцент жасайды. Оқушылар, оқушылар мен мұғалімдер арасындағы қарым-қатынасты жақсартатын, сонымен қатар, дағдыларды дамытатын және әлемдік тәжірибе сияқты осы әдістің оң жақтарын айтылып өтілді. Сонымен қатар, мұғалімдер бұл әдістің білім мен уақыттың жеткіліксіздігі және топта жұмыс жасау мәселелері сияқты жағымсыз жақтарын ескертіп өтті.

*Қорытындысы.* Жұмыстың нәтижелері оқытушылардың осы әдістің оң және теріс аспектілері арқылы қабылдайтынын және де жоғарыда аталған артықшылықтары мен кемшіліктері негізінде қабылдайтынын көрсетті. Бұл жұмыстың нәтижелері жобаға негізделген оқыту оқушылардың оқуға деген қызығушылығын арттыра отырып, бұл әдісті табысты пайдалануға мұғалімдерге қажетті дағдыларды бойына сіңдіруге үлесін қосатынын атап өту маңызды.

*Түйінді сөздер:* жобаға негізделген оқыту, артықшылықтар, кемшіліктер, оқытушылар, оқушылар.

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## **Chapter 1. Introduction**

My research study is about teacher perceptions regarding project-based learning (PBL) in a Kazakh-Turkish Lyceum in the northern part of Kazakhstan. This chapter includes the problem statement, the purpose of the study, research questions, the significance of the study, and the outline of the thesis.

### **Problem Statement**

With the accelerating pace of the current world, contemporary educators are expected to adapt and rise to changes and new challenges in education. The 21<sup>st</sup> century requires educators to use new ways of learning and teaching that will provide students more freedom in the expression of their ideas. Kazakhstan sought to replace traditional academic strategies of memorization and passive learning by more active student-centered learning. However, this kind of shift requires a new type of approach that is geared toward student-centered learning. Project-based learning (PBL) has emerged as one of the most prominent approaches for responding to these needs and demands and has gained much attention of the Kazakhstani educators (McCarthy, 2016).

Krajcik and Blumenfeld (2006) state that almost all students are bored in class. The lack of student engagement in learning is also of importance for Kazakhstani education (Kabulova, Pussurmanova, Shaikhina, Akhmedina, & Issina, 2016). The PISA results indicate that Kazakhstani education faces issues of high level of student absenteeism and regular lack of punctuality, which could be indicators of decreasing student attitudes towards learning (OECD, 2013). Moreover, the literature shows that student engagement is perceived as a predictor of academic achievement (Willms, 2003). This might suggest that in order to raise the academic success of Kazakhstani students, first of all there is a need to increase their motivation on lessons.



Studies reveal that instructional methods such as group projects, projects and lessons involving technology and presentations are among the instructional methods most favored by students, while uninteresting and irrelevant learning materials and the absence of interaction with teachers are demotivating factors (Yazzie-Mintz, 2010). The literature shows that PBL organizes learning around projects, provides students with an opportunity to create final artifacts using technology and present their works to the real audience (Thomas, 2000). PBL gives them the excitement of learning and raising their interest in solving real-world problems (Bell, 2010). Moreover, learners get to enjoy the learning process, as it includes the focus of their interests and allows them to learn by applying a hands-on approach. The important point is that students will have a chance to deeper understand the subject content through gaining real-life experience (Harrigan, 2014).

In recent years, PBL has been integrated into instructional practices of many schools in Kazakhstan (McCarthy, 2016). PBL is presented as an effective student-centered learning method with the variety of benefits for students despite imposing some difficulties for learners. Many studies on teacher perceptions about PBL (Baysura, Altun & Toy, 2016; Habók & Nagy, 2016; Harrigan, 2014; Hovey & Ferguson, 2014; Hugerat, 2016; Tamim & Grant, 2013; Van den Bergh, 2006) seem to attest to that. However, to date, such views on PBL have been based mostly on international experience, and there is a shortage of research reflecting the Kazakhstani context. It remains unclear how Kazakhstani teachers understand PBL, and what benefits and challenges of using PBL they identify for their students. Therefore, this study seeks to fill the gap in literature about the application of project-based learning in Kazakhstan.

**Purpose of the study**

The purpose of this qualitative study is to explore secondary school teacher perceptions of project-based learning (PBL) in a Kazakh-Turkish Lyceum in the northern part of Kazakhstan and to identify the benefits and challenges of using PBL.

**Research questions**

The following research questions will guide my study:

1. How do teachers understand PBL?
2. What are the benefits of using PBL?
3. What are the challenges of using PBL?

**Research design**

Qualitative research design has been chosen to gather a more detailed understanding of teachers' feelings, beliefs, and perceptions of PBL, its benefits and challenges, and to present vital information on how PBL works in the context of Kazakhstan. As KTL teachers are specifically trained for PBL (McCarthy, 2016) and use it in their practice, focusing on the experiences of teachers at this particular type of school seemed imperative. As such, a Kazakh-Turkish Lyceum for gifted boys located in the northern part of Kazakhstan has been selected as a research site of this study. The sample size consists of four secondary school teachers who teach the following subjects:

Chemistry, Computer Science, Physics and English language.

**Significance of the study**

The significance of this study is manifold. The results of this study could be beneficial for teachers, as it would help them reflect on their own practice in using PBL. Interpretation of teachers' points of view, experiences, and attitudes towards PBL could provide insight into the challenges that both teachers and students face. It will be helpful as their voices would be heard by the school administration, which would have the

opportunity to think of the most effective methods and ways of overcoming the challenges in using PBL.

Furthermore, a deeper understanding of teachers' perceptions and challenges about PBL will definitely contribute to a better implementation of this learning style in the future and help teachers to better instruct their students in working on projects and help them gain all the necessary skills for developing the project and working collaboratively in a project team. Teachers will have the opportunity to succeed as effective facilitators of project work activities (Yezhitskaya, 2014). Moreover, teachers would likely have better contact with every student and get the opportunity to learn from students and from each other (Nicola & Allison, 2014). While both teachers and students benefit from using PBL, it would also be beneficial for the whole school, as students with a better understanding of PBL implementation are more likely to be successful at different academic competitions, such as Young Inventors Project Competition (YIPC) and other regional and republic project competitions. As a result, it could lead to the increase of the school's rating.

The results of this work could motivate and provide insight for policy makers in Kazakhstan to deeply investigate project-based learning as an alternative teaching and learning strategy that would be likely to improve students' motivation and academic achievement (Harrigan, 2014). Moreover, as PBL is being implemented in Kazakh-Turkish Lyceums (KTL), the examination of PBL in these schools would be very useful to see how it can be best adapted and implemented in mainstream schools in the context of Kazakhstan.

### **Operational definitions of terms**

*Project-based learning:* a student-centered, teacher-facilitated approach that organizes learning around projects (Bell, 2010; Thomas, 2000). To understand the

difference between project-based learning and projects, a comparison table is provided in Appendix E.

### **Outline of the thesis**

Chapter 1, “Introduction” presents the core elements of this study: the research problem, the purpose of the study, research questions, and the significance of the study.

Chapter 2, “Literature review” provides the review of major studies carried out on my research problem. It investigates teacher perceptions on PBL, its benefits and challenges.

Chapter 3, “Methodology” includes the research design, sampling, data collection and data analysis processes, and ethical considerations.

Chapter 4, “Findings” presents the main findings of the study.

Chapter 5, “Discussion” provides the explanation and interpretation of the findings. It compares these findings with the literature in Chapter 2, showing the similarities and differences between them.

Chapter 6, “Conclusions and Recommendations” includes the summary of findings structured by research questions, recommendations for professional practice and policy in education, limitations of the study, implications for further research and self-reflection as a researcher.

## **Chapter 2. Literature review**

The purpose of this study is to explore teacher perceptions of PBL, its benefits and challenges. In this chapter, review of the relevant literature is presented. The chapter describes literature related to my topic. It includes the conceptual framework, definition of project-based learning, history and development of PBL, teacher perceptions of using PBL, its benefits and challenges, and PBL in Kazakhstan.

### **Conceptual framework**

The experiential learning theory by John Dewey, Kurt Lewin, and Jean Piaget states that people learn through experience (Kolb & Kolb, 2012). Dewey (1897) believes that “education must be conceived as a continuing reconstruction of experience” (p. 5). This experience is gained by active learning, thinking, feeling and perceiving. The experiential learning is considered as the result of the interaction between the human and his or her environment (Kolb & Kolb, 2012).

According to Harrigan (2014), the experiential learning theory served as the basis for the development of the constructivist theory, which states that learners do not acquire knowledge but actively construct it themselves. This theory was developed by Jerome Bruner, John Dewey, Lev Vygotsky and many other scholars. Constructivists claim that learners do not transfer ready knowledge from outside but create their own meaning and interpretation of the world through gained experience (Ertmer & Newby, 1993).

My study is based on the combination of these two theories. Harrigan (2014) states that both experiential learning and constructivist theories lead to the theoretical foundations of project-based learning. PBL “provides a framework for cohesively combining a series of educational strategies” (Baumgartner & Zabin, 2008, p. 98). Many scholars admit that there are many benefits of using PBL for students. Unfortunately, both

teachers and students do not always take full advantage of PBL implementation (Tamim & Grant, 2003). They may struggle, having different challenges while implementing it. I examine Kazakhstani teachers' perceptions regarding PBL in order to explore the various benefits and possible challenges of using PBL in the context of Kazakhstan.

### **Definition of project-based learning**

PBL has been described by different authors in many ways. Therefore, there is no single definition for this term and no common agreement has yet been reached (Baş, 2011). Thomas (2000) states that PBL “is a model that organizes learning around projects” (p. 1). It can be different tasks with questions and problems that involve students in problem solving and investigative activities. According to Solomon (2003), PBL is all about learning through experiences. Kubiato and Vaculova (2009) believe that “project-based learning is an instructional method centered on the learner” (p. 66). It gives students the opportunity to work on a problem and investigate the topic deeply through learning more about it (Harris & Katz, 2001, as cited in Kubiato & Vaculova, 2009). Bell (2010) also states that PBL is an instructional method that is focused on the learner who is guided by a teacher during all the steps of the project.

According to Doppelt (2003), PBL is a method that helps to create a pleasant and flexible learning environment for students that will improve their skills and instill thinking competencies. PBL can also be defined as a strategy that motivates students to explore something new by integrating knowledge from already existing subjects (Barak & Doppelt, 2000, as cited in Kubiato & Vaculova, 2009). Furthermore, PBL is defined as an educational strategy that engages and motivates students in finding answers by themselves (De Graaff & Kolmos, 2007). For this study, the definition of PBL by Bell (2010) and Thomas (2000) will be used: PBL is a student-centered, teacher-facilitated approach that organizes learning around projects.

To sum up, there is no single definition for the term project-based learning. However, the main idea of PBL is that it is a project work learning strategy that motivates students in their own learning, provides them with the opportunity to work in teams, and helps them gain 21<sup>st</sup>-century skills by solving real-world problems.

### **History and development of PBL**

In the past 25 years PBL has become an independent educational method due to huge developments in learning theory (Coffey, 2008). However, it is not a new idea, and has been used in the learning process for many years via giving different projects, therefore, planning different field trips, laboratory investigations, games, and activities (Thomas, 2000). Indeed, the history of project-based learning can be traced back to ancient times. De Graaff and Kolmos (2007) argue that a Confucian view on education represents early aspects of PBL.

The modern view on PBL takes its roots in the educational philosophy of the American philosopher and educator, John Dewey, who first proposed PBL in 1890s (Douglas & Stack, 2010, as cited in Habók & Nagy, 2016). Dewey expanded the concept of learning by doing. He argued that students should be actively involved in real-world problems in order to improve their personal skills and abilities. His idea was about active inquiry resulting in deeper understanding of the problem (Krajcik & Blumenfeld, 2006). His views helped shape other theories and concepts such as William Heard Kilpatrick's project-based instruction which is composed of steps such as planning, purposing, executing and judging (Foshay, 1999, as cited in Baş, 2011). Moreover, he suggested that projects could be used in different subjects to provide students with a wide diversity of ideas and concepts (Kubiatko & Vaculova, 2009).

According to Wertsch (1985), there is also a Vygotskian perspective regarding PBL. Vygotsky suggested that students learn best through social interaction and there is a

need to get out of their comfort zone by doing more difficult tasks (as cited in Kubiátko & Vaculova, 2009). The experiential learning concepts of both Dewey (1938) and Vygotsky (1987) led to the development of PBL principles (Habók & Nagy, 2016).

Although it seems that PBL had a long history of development, Baş (2011) states that it is still in the developmental stage, and can have many improvements in the future. Nevertheless, it is important to note that the foundation of PBL is based on learning through experience and interaction with others in this process.

### **Teacher perceptions of PBL**

Teachers understand PBL in many different ways due to the differences in experience, teaching subject and other various factors. Regarding this, Ravitz and Blazevski (2010) say that “no two teachers implement PBL in the exact same way” (p. 178). Empirical studies that focused on teacher perceptions of PBL report that teachers carry positive pedagogical beliefs about PBL (Harrigan, 2014; Tamim & Grant, 2013). However, the literature presents certain aspects through which teachers understand PBL.

Teachers perceive PBL as a student-oriented approach that enables self-learning (Baysura, Altun & Toy, 2016; Bell, 2010; Harrigan, 2014; Tamim & Grant, 2013). PBL requires self-regulation, allowing students some degree of voice and choice to select the topic, to find their own sources, to work autonomously on projects at their own pace, considering their interests and needs (Baş, 2011; Ravitz, Hixson, English, & Mergendoller, 2012; Tamim & Grant, 2013; Thomas & Mergendoller, 2000). At the same time, teachers understand their own role as facilitators or supervisors, who provide students with guidance and scaffolding in the form of teacher-student interactions, guiding questions, peer-counseling and practice worksheets (Grant, 2002; Thomas & Mergendoller, 2000). In the very beginning teachers use planning strategies of PBL to plan the study, present



objectives, set checkpoints and deadlines, and explain the assessment criteria for the project (Baysura et al., 2016, Thomas & Mergendoller, 2000). Moreover, they use management and orchestration strategies of PBL to form groups, direct and support learners all along the PBL implementation process. According to PBL teachers, the issue of classroom management is quite different from other traditional instructional methods, such as discussion, lecture or seatwork. Teachers do not use teacher-oriented methods, nor do they present any material or lead activities during PBL. Most of the time students work independently in their own small groups. Some of teachers even claim that they feel as though they are acting as their peers rather than as classroom managers (Thomas & Mergendoller, 2000).

Teachers also understand PBL as an authentic learning process that requires students to prepare final realistic products (artifacts), presentations or models (Grant, 2002; Thomas & Mergendoller, 2000, Yam & Rossini, 2010). Baysura et al. (2016) and Tamim and Grant (2013) believe that designing the final artifact is the main stimulating force in PBL, which motivates students to gain skills and better understand the subject content in order to produce that artifact. When the projects are ready, learners also have the opportunity to present their works to the real audiences like professionals do (Baumgartner & Zabin, 2008; Bell, 2010; Van den Bergh et al., 2006; Yam & Rossini, 2010). Moreover, teachers believe that PBL is a chance for students to create something meaningful that is of importance for the world (Beneke & Ostrosky, 2009; Harrigan, 2014; Tamim & Grant, 2013).

Another important aspect that differentiates PBL from other instructional approaches is collaboration (Bell, 2010; Krajcik & Blumenfeld, 2006; Ravitz et al., 2012; Rogers, 2014; Tamim & Grant, 2013). Teachers perceive PBL as a team work approach, which can boost student engagement, provide students with the opportunity to work in

groups, share ideas, help each other and learn from mistakes of peers (Tamim & Grant, 2013). According to Grant (2002), collaboration includes peer reviews and brainstorming sessions. Moreover, teachers see PBL as a chance to collaborate with their colleagues and share ideas on developing projects (Harrigan, 2014; Tamim & Grant, 2013).

Teachers also differentiate PBL from other instructional methods in terms of assessment (Ravitz et al., 2012). In order to show high quality of the final work, PBL requires teachers to use continuous assessment, which is considered an ongoing process of evaluation from the beginning until the last stage of PBL (Hugerat, 2016). Teachers using a monitoring strategy of PBL control students' progress through all project stages and provide them with appropriate on-time feedback (Thomas & Mergendoller, 2000). Moreover, teachers use criteria-based assessment, which is suitable for conducting PBL because they can provide students with clear objectives and expectations about the project requirements (Grant, 2011, as cited in Tamim & Grant, 2013). Self-assessment and peer-assessment are also used in PBL (Tamim & Grant, 2013).

In sum, a large plethora of international literature on PBL demonstrates that teachers' views are multifaceted. Nevertheless, the review indicates that teachers generally understand it as a student-centered learning where teachers act as facilitators rather than lecturers. Moreover, it is perceived as an excellent tool to engage learners in solving real-world problems and work together in groups, sharing ideas and helping each other. Lastly, PBL is perceived as an effective approach to assess students all along the implementation process.

### **Benefits of using PBL**

According to Fallik, Eylon, and Rosenfeld (2003), teachers identified more benefits of using PBL than difficulties (206 to 132 respectively). Benefits were mentioned mainly for students (95%), whereas challenges were for teachers (57%) (Fallik, Eylon, &

Rosenfeld, 2003). Similarly, very few benefits were found for teachers. They are enhanced collaboration with colleagues to deal with PBL issues (Harrigan, 2014; Tamim & Grant, 2013) and better relationships between students and teachers (Hugerat, 2006; Nicola & Allison, 2014; Thomas, 2000; Van den Bergh et al., 2006). Other benefits are reported for students, such as increased engagement, skill development, improved academic achievement, and other benefits.

**Increased motivation.** The first major benefit of using PBL is the increased engagement and motivation to learn (Baş, 2011; Bell, 2010; Hugerat, 2016; Larmer et al., 2015; Thomas, 2000; Yam & Rossini, 2010). Harrigan (2014), Krajcik and Blumenfeld (2006), and Kubiak and Vaculová (2011) believe that PBL raises students' engagement in various investigations where students can deal with real issues and learn experiences beyond the classroom. According to Thomas (2000), these investigations may be “design, decision-making, problem-finding, problem-solving, discovery or model-building processes” (p. 3). Hugerat (2016) investigating the effect of PBL on classroom learning in two Arab schools in Israel, reports that ninth-grade students involved in PBL were more satisfied with the scientific tasks and enjoyed the class more than non-PBL students.

Students are motivated in learning because PBL provides them with a hands-on approach to content (Holm, 2011). There is a slightly different perspective from Worthy (2000), who suggests that students using PBL are motivated and enjoyed because they have that autonomy they miss in the traditional approach (as cited in Yam & Rossini, 2010). Yam and Rossini (2010) believe that teachers are the key figures in motivating students and creating that collaborative atmosphere in the classroom. Frank, Levy, and Elata (2003) analyzed semi-structured interviews of engineering students who studied in the Faculty of Mechanical Engineering at the Technion. They found that the main reason for increased motivation of students is the competition element between groups.

Tamim and Grant (2013) conducted a case study exploring in-service teachers' experiences regarding PBL. The purposeful sample was composed of six teachers (two males and four females) who had more than one year of PBL experience. Teachers were from three public schools and one private school in USA. They found that PBL increased students' enjoyment and motivation to learn. Teachers reported that students became more engaged because they got the chance to show their learning and took ownership in their work. Other research studies on teachers' perceptions also report the increase of motivation to learn by students involved in PBL (Hugerat, 2016; Krajcik & Blumenfeld, 2006; Van den Bergh et al., 2006). On the other hand, the study of Shachar and Fisher (2004) indicated that PBL approach decreased the motivation of high school students. They claim that PBL is based on group work and therefore students had a decrease in engagement to learn, as they were not used to work in groups very often (as cited in Baumgartner & Zabin, 2008).

In sum, PBL is considered an effective tool to increase student engagement because PBL provides learners with opportunities to learn by doing. Students may go beyond the school curriculum in order to deal with real-world problems, which also might add to their motivation. However, there is a claim that PBL can also decrease student engagement.

**Skill development.** Students involved in PBL activities have a chance to develop a wide variety of skills (Bell, 2010; Frank et al., 2003; Harmer & Stokes, 2014; Hugerat, 2016; Larmer et al., 2015; Thomas, 2000; Yam & Rossini, 2010). Nicola and Allison (2014) provide a list of skills identified in PBL literature. The most frequently mentioned skills are collaboration skills, communication skills, problem-solving skills and critical thinking skills (p. 14). Researchers claim that PBL enhances 21<sup>st</sup>-century skills (Bell, 2010; Harmer & Stokes, 2014; Ravitz, Hixson, English, & Mergendoller, 2012; Larmer et al., 2015). Harrigan (2014) interviewed 10 female teachers regarding their experiences of

integrating PBL and found that they all expressed that PBL develops 21<sup>st</sup>-century skills in their students, such as critical thinking skills, teamwork and cooperation skills. Participants of this study perceived 21st century skills as one of the four major benefits of using PBL. Bell (2010) in his study “Project-Based Learning for the 21<sup>st</sup> century: Skills for the future” states that skills gained through PBL are necessary for success in the twenty-first century. “By implementing PBL, we are preparing our students to meet the twenty-first century with preparedness and a repertoire of skills they can use successfully” (Bell, 2010, p. 42). Furthermore, Ravitz and Blazeovski (2010) found that effective use of PBL by teachers who received extended professional development on PBL can lead to the development of 21<sup>st</sup>-century skills by students and have an enormous impact on 21<sup>st</sup>-century teaching and learning. In addition to 21<sup>st</sup>-century skills, Larmer et al. (2015) also report on “success skills”, such as interdisciplinary skills, soft skills, teamwork skills and time-management skills. They suggest that all these skills might be necessary for their future carriers.

Baumgartner and Zabin (2008) conducted a case study examining the effect of PBL on ninth grade students’ attitude towards science at a small suburban school in Honolulu, USA. They found that students who participated in PBL scientific investigations improved their problem-solving skills, critical thinking skills, higher-order thinking skills, and scientific thinking skills. As a group work approach, PBL also provides learners with opportunities to gain collaboration and communications skills (Baş, 2011; Bell, 2010; Krajcik & Blumenfeld, 2006). In addition to the mentioned skills, PBL also develops laboratory skills, information retrieval skills, interpersonal abilities (Frank et al., 2003), research skills, communication skills, and time-management skills (Tamim & Grant, 2013).

In sum, literature provides many skills that are developed during PBL. The major ones are 21<sup>st</sup> century skills, such as creativity, critical thinking, and collaboration. In

addition to 21<sup>st</sup> century skills, there are also research skills, time-management skills, and interpersonal skills. Scholars highlight that these skills might be useful for learners in their future life.

**Improved academic achievement.** Researchers provide evidence regarding the impact of PBL on the growth of academic achievement. Margaret Holm (2011) provides a view of research studies conducted between 2000-2011 regarding the effectiveness of PBL in preschool, elementary and secondary school classroom settings. All studies indicate the positive attitudes of students towards PBL and demonstrate the growth in academic achievement after using PBL. DiEnno and Hilton (2005) state that students engaged in PBL show significantly high knowledge results because PBL provided them with the opportunity to learn by doing (as cited in Baumgartner & Zabin, 2008). Moreover, Shachar and Fisher (2004) highlighting the fact that PBL is a group work method, found that high school students in Israel showed a significant increase in academic achievement when the PBL approach was used (as cited in Baumgartner & Zabin, 2008).

Gokhan Bař (2011) investigated the effects of PBL on students' academic achievement and attitudes towards English lesson in a high school in Nigde, Turkey and found that PBL significantly increased 9<sup>th</sup>-grade students' academic gains in English and their attitude towards it (Bař, 2011). He compared students who were involved in PBL with non-PBL students and found that PBL group performed better than students who did not use it. According to his results, PBL group showed better academic results because students were actively working in groups, sharing ideas and tried to understand the point of views of others. Moreover, they learned to take responsibility for their groupmates.

Harrigan (2014) examined teachers' experiences of integrating PBL into the classroom. The participants were experienced teachers of primary schools in a southern

Florida school district, who mentioned the academic success as the main benefit of implementing PBL in all classes. Participants of this study reported that their students to work harder and better understood the topic during PBL activities.

Studies demonstrate that students in PBL classrooms get higher scores than those in traditional classes. PBL improves students' academic achievement because of social interaction between students, as they collaborate with each other, share their best ideas and learn from their peers. Another reason is that students get opportunities to learn by doing and create their own knowledge.

**Other benefits.** One of the advantages of using PBL is the improved relationship between students. PBL promotes support, understanding, and respect among students, creating a pleasant collaborative atmosphere in the classroom (Baş, 2011; Baumgartner & Zabin, 2008; Frank et al., 2003; Krajcik & Blumenfeld, 2006; Kubiato & Vaculová, 2011). According to Bell (2010), students working in groups also motivate and help each other because they have a common goal and in order to finish and get a successful final product, every member of the group must contribute equally. Students learn how to organize work, communicate and deal with conflicts in groups. However, Hugerat (2016) did not find any significant differences between PBL and non-PBL students in terms of student-student relationships. On the other hand, many scholars agree that PBL improves relationships between students and teachers (Hugerat, 2006; Nicola & Allison, 2014; Thomas, 2000; Van den Bergh et al., 2006).

Another vital advantage of implementing PBL is the real-world practice (Bell, 2010; Van den Bergh et al., 2006; Yam & Rossini, 2010). "Project-based learning can make learning relevant to the real world" (Baumgartner & Zabin, 2008, p. 2). Students involved in PBL engage in real world activities, meaningful problems which are interesting

and important to them and are similar to what adult professionals do (Krajcik & Blumenfeld, 2006; Larmer et al., 2015). According to Gultekin (2005), students using PBL become better researchers and problem solvers (as cited in Bell, 2010). Moreover, PBL has the potential to engage students beyond academia, which means that they have opportunities to contact scientists, professionals and future employers (Nicola & Allison, 2014). However, only a few schools can involve their students in real-world issues and provide the opportunity to contact partnerships (Larmer et al., 2015). Lastly, on the other hand, there are studies that report that PBL is beneficial for learners with different needs and from different backgrounds (Bell, 2010; Holm, 2011; Hovey & Ferguson, 2014; Thomas, 2000). On the other hand, the relation of PBL to diverse learners is an area where further research is needed (Nicola & Allison, 2014).

In sum, PBL provides students with a deeper understanding of the topic, which may probably result in a higher academic performance. Several research studies provide evidence on the positive effect of PBL on the growth of academic achievement of students. Another important advantage is the increase of engagement and motivation to learn, as it is crucial for students to enjoy the lessons and stay highly involved in the learning process. The main reason is that learners have opportunities to deal with real problems beyond the classroom and that are interesting to them. As well as this, they work in groups, which makes learning more engaging, as they can share their ideas and help each other. In addition to this, students develop a wide diversity of skills, such as social, academic and personal skills that will be necessary for their future lives in the 21<sup>st</sup> century. Moreover, scholars report that there are many other benefits of using PBL, such as better relations between teacher and students, among students, successful work with diverse learners and better Internet and technology use. Bell (2010) indicates that PBL is a good approach for students to learn how to use the Internet and a wide variety of technologies (Krajcik &



Blumenfeld, 2006). However, technology use is often considered as a challenge of implementing PBL (Harrigan, 2014; Mergendoller & Thomas, 2001).

### **Challenges of using PBL**

As well as benefits, there are many difficulties perceived by teachers. Even if PBL has many advantages, it requires a huge effort from teachers to implement it successfully. In this case, it is important to solve all upcoming challenges in order to succeed. This section provides information about major challenges in PBL implementation. These challenges were classified into the most important three categories: lack of time, group work, and new facilitator role.

**Lack of time.** Various empirical research studies exploring students' and teachers' perceptions regarding PBL report that PBL is a time-consuming approach (Baysura et al., 2016; Habók & Nagy, 2016; Harrigan, 2014; Harris, 2014; Krajcik & Blumenfeld, 2006; Mergendoller & Thomas, 2001; Van den Bergh et al., 2006; Yam & Rossini, 2010). Therefore, it is problematic for both teachers and students (Van den Bergh et al., 2006). Krajcik and Blumenfeld (2006) state that a lot of teachers do not have enough time to plan and prepare projects. Baysura et al. (2016) conducted a qualitative study on 58 students' perceptions regarding PBL. These teacher candidates complained about the lack of time and some of them even refused to implement PBL because according to them, it required too much time and too much of an increased workload. Frank et al. (2003) reported that PBL requires a much heavier workload than traditional lessons (as cited in Yam & Rossini, 2010).

Harrigan (2014) examined female teachers' experiences about PBL in an urban school district in southern Florida. The participants were very specific and reported that a long period of time was necessary to plan the projects and work with students to complete

these projects. Matthew Harris (2014) studied the challenges of implementing PBL in a suburban school district outside Pittsburgh, Pennsylvania. His participants were teachers of different subject areas, such as math, social studies, science, arts, language, and reading. According to Harris, teachers reported that they did not have enough time to implement PBL and the main reason was that they had to spend much time on planning and designing PBL. Moreover, teachers noticed that their students also had this problem, as they had to meet their peers in order to plan and work on the projects together.

Kubiatko and Vaculová (2011) state that one of the main reasons of low PBL implementation into classrooms is the lack of time which is necessary to create new curricula. However, Marx et al. (1997) suggest that PBL is a time-consuming approach because it requires an in-depth investigation of real issues and the work with this kind of projects may take more time than it was planned in the beginning (as cited in Thomas, 2000). According to Frank and Barzilai (2004), the time issue of PBL is related to the need of project guidance and a different way of project assessment, used in PBL evaluation, such as formative assessment (as cited in Nicola & Allison, 2014).

In sum, PBL is considered as a time-consuming approach for both teachers and students. Teachers complain that they have to spend much time to plan, prepare and design the projects. Moreover, teachers should spend a lot of time to guide learners, provide them with necessary feedback and assess their works. Students involved in PBL deal with real-world problems and concerns, which may have unexpected outcomes and take more time than was intended in the beginning. Moreover, students have to devote time to meet with their group mates, discuss and work on their projects together.

**Group work.** Several scholars indicate that collaboration during PBL implementation is a huge obstacle (Baysura et al., 2016; Harris, 2014; Van den Bergh et al., 2006). Group work is considered the most significant difficulty for students and

teachers who are involved in PBL implementation (Nicola & Allison, 2014). Teacher candidates complain that their students have problems with working in groups and they may not have the abilities to equally contribute to the project work (Baysura et al., 2016). According to Harris (2014), teacher participants report that their students faced difficulties in collaboration and team work, highlighting the fact that only the leaders in groups took the responsibility, while others were passive. There are identified cases of unequal contribution to group work when some members of the group become free-riders. As a result, it could lead to conflicts within the group (Nicola & Allison, 2014). Johnson and Johnson (1898) believe that group work is challenging to students because they do not have enough skills and experience in collaboration and communication within the groups (as cited in Yam & Rossini, 2010). Moreover, they emphasize the importance of guiding and supporting students in collaboration by the instructors.

Students face problems in group work because their teachers do not have appropriate skills and knowledge to support and guide them in collaboration (Frank et al., 2003; Krajcik & Blumenfeld, 2006). Moreover, students are used to getting ready answers from the instructors and are not interested in finding the solutions by themselves working together in groups. Another difficulty might be that teachers do not believe that team work could be useful for their students in terms of understanding and academic achievement (Krajcik & Blumenfeld, 2006). Van den Bergh et al. (2006) exploring teachers' and students' perceptions towards group-based assessment and PBL report that the issues with collaboration occur due to different ways of assessment by instructors.

Even though many scholars identify the group work as a huge difficulty, Hugerat (2016) found that a collaborative atmosphere during PBL implementation allows students to have less tension and conflict between one another. Other researchers also believe that collaboration is a huge advantage of using PBL, as students improve their collaboration

and communication skills (Larmer et al., 2015), actively learn from each other within and between the groups, and take responsibility for the whole group (Bell, 2010). Moreover, team work can lead to better discipline in the classroom (Bell, 2010).

In sum, group work is identified as one of the main challenges in PBL implementation. Scholars report that both teachers and students may lack the appropriate training, skills, and knowledge of collaboration, therefore, they face different problems, such as unequal contribution within the groups and free-riding by some members of the group. The key figures to overcome these obstacles are the instructors who should be informed and interested to use team work and guide their students in collaborating.

**New facilitator role.** PBL requires teachers to have a quite different role from the role they have on traditional lessons. Nicola and Allison (2014) state that teachers struggle with their new role of facilitators. As PBL is more a student-centered approach, teachers should behave more like advisors and mentors rather than lecturers. For example, Tamim and Grant (2013) studying in-service teachers' perceptions towards PBL report that participants perceived themselves as guides and monitors who should support the learners through all PBL steps.

On the other hand, the shift of teachers to the new role of advisor might be a huge challenge that teachers may face during PBL implementation (Bender, 2012; Markham et al., 2003 as cited in Harris, 2014). Ertmer and Simons (2006) believe that it is difficult to shift from teacher-centered approach to student-centered learning and this process must be natural and gradual (as cited in Tally, 2015). Teachers struggle to adapt their teaching methods to PBL, as they are used to provide everything ready to their students; however, PBL requires them to guide and show them direction so that students will construct their own knowledge and do the work by themselves (Frank et al., 2003).

It is worthwhile to mention that some teachers even refuse to use PBL because they are unfamiliar with this approach and have many issues with managing the classroom (Baysura et al., 2016). The problem is that teachers do not have enough experience on scaffolding and do not know how much guidance they should provide to their students so that they will have the appropriate amount of freedom necessary for self-study (Baysura et al., 2016). According to Tally Tara (2015), scaffolding is an amount of help from teachers to help students complete difficult tasks until students get autonomy and independence in doing these tasks themselves. While teachers provide students with the freedom they should be able to keep discipline in the classroom (Marx et al., 1997, as cited in Thomas, 2000).

**Other challenges.** There are many other difficulties identified in the literature. Scholars report that teachers struggle with the designing of assessment to evaluate students' project works (Nicola & Allison, 2014; Thomas, 2000). Matthew Harris (2014) found that assessing the project was identified as one of the top ten most important challenges faced by teachers during PBL implementation. Moreover, Baysura et al. (2016) report that teacher candidates complained that it was hard to assess the process of PBL implementation. It is worth mentioning that the problem of assessment might also occur because every teacher used his or her own criteria while assessing different groups (Van den Bergh et al., 2006). Furthermore, traditional assessment techniques could not be used to evaluate students' works involved in PBL implementation (Habók & Nagy, 2016; Van den Bergh et al., 2006).

Another difficulty is the lack of available resources and materials necessary to implement PBL. Teachers perceive the lack of appropriate materials, resources, technologies and funds as the major obstacles in implementing PBL (Baysura et al., 2016; Harrigan, 2014; Harris, 2014; Nicola & Allison, 2014). Moreover, crowded classes (Nicola

& Allison, 2014) and the lack of experience in using technology (Harrigan, 2014) are identified.

In sum, teachers identify various challenges in implementing PBL. Both teachers and students complain that PBL requires too much time and increased workload in order to plan and design PBL. Teachers spend much time to guide students, give feedback to their works and assess them. On the other hand, students devote their time to meet with each other, plan and work on their projects together. Group work is also considered a major challenge. In this case, teachers may not have enough experience and knowledge to support students in team work. As a result, students can have conflicts in groups and problems, such as unequal contribution: while some students take more responsibility, others become free-riders. Moreover, it is also challenging for teachers and students to shift from a teacher-centered approach to learner-centered learning, as they may be used to traditional lessons. Assessment is another obstacle, as traditional assessment ways are not appropriate to evaluate students involved in PBL. Every teacher can assess groups differently according to his or her own criteria. Furthermore, scholars report on other difficulties, such as the lack of resources and materials, large class sizes, and problems with using technology.

### **PBL in Kazakhstan**

In order to reach academic success, PBL was introduced by KATEV foundation (Kazakhstan ve Türkiye Eğitim Vakfı) to develop global success skills that will help Kazakhstani students become more effective global citizens (McCarthy, 2016). KATEV foundation is a publically funded school system that controls more than 36 Kazakh-Turkish Lyceums spread across Kazakhstan. PBL has been actively used in Kazakhstan for more than 5 years. Starting from 2014 KATEV every year organizes Young Inventors Project Competition (YIPC) among all Kazakh-Turkish Lyceums across the country. YIPC is

organized by the initiation of Nazarbayev's (2014) program "Kazakhstani way – 2050: Common goals, common interests, and common future". This competition is based on project-based learning and teachers are the main facilitators of this approach. They have appropriate knowledge on how to use PBL and the necessary skills to help students deal with their project work. Moreover, they are involved in all steps of the project work. Nevertheless, as PBL is a new approach in Kazakhstan, there are very limited studies found on PBL, its benefits and challenges in the context of this country.

### **Summary**

This chapter provided a literature review of PBL, its definition, history, benefits, and challenges. Many authors understand PBL in different ways, thus there is no single definition for this term. However, it can be said that project-based learning is an instructional method centered on the learner that organizes learning around projects. John Dewey, William Heard Kilpatrick, and Vygotsky have the most important roles in the development of PBL.

Teacher experiences and perceptions of using PBL were also presented, giving insight into benefits and challenges of using PBL. According to many studies, teachers believe that the most important benefits for students are increased academic achievement, higher level of engagement to learn and the development of 21<sup>st</sup>-century skills, such as collaboration, creativity, and critical thinking. At the same time, the major challenges are assessment issues, lack of time, resources and appropriate knowledge to implement PBL.

### **Chapter 3. Methodology**

In this chapter methodology of this study is presented. It includes the research design, research sampling, instrumentation, data collection, data analysis and ethical considerations.

#### **Research design**

A qualitative research design has been chosen for this study. According to Creswell (2014), qualitative research methods provide the opportunity to gain valuable information from participants on the phenomenon when very little is known about it. Little is known about teacher perceptions of PBL in Kazakhstani context. Therefore, I used qualitative research design to explore teacher perceptions of KTL teachers about PBL, their views and considerations of the benefits and challenges of using PBL. Moreover, this research design allows me to directly contact participants, which may provide insight into very important details that quantitative research can miss. Qualitative research method also best answers the research question of this study: How KTL teachers understand PBL. A case study approach has been chosen for this research in order to closely examine the data within its real-life context (Zainal, 2007). “Case studies are used to collect descriptive data through the intensive examination of an event in a particular group, organisation or situation” (Boodhoo & Purmessur, 2009, p. 5). It is a single case study of one KTL school.

#### **Research sampling**

The research was conducted in a Kazakh-Turkish Lyceum in the northern part of Kazakhstan. This school was selected because it provided me with easy access to participants and necessary resources. Criterion sampling was chosen for this study to select participants according to several criteria. They were as follows:

1. Participants had to be involved in PBL and have experience to conduct it.



2. Different subjects had to be included to explore the phenomenon from multiple perspectives of various subjects.
3. Teachers had to be willing to participate.

A sample was composed of four teachers who taught Chemistry, Computer Science, English language and Physics (see table 1). Several teachers of other subjects refused to participate in this study due to circumstances.

Table 1

*List of participants*

Participants	Gender	Subject	Teaching	PBL practicing
Participant 1	Male	Computer Science	2 years	2 years
Participant 2	Male	English language	7 years	3 years
Participant 3	Male	Chemistry	4 years	2 years
Participant 4	Male	Physics	1 year	1 year

**Data collection**

In this study interview was selected as the main tool for data collection. It provided me with in-depth and context-rich perceptions of participants regarding PBL. The advantage of the interview is that it allows teachers to describe detailed information on their perceptions of project-based learning, its benefits and challenges. Moreover, the interview makes it possible to have better control over the types of information received, as “the interviewer can ask specific questions to elicit this information” (Creswell, 2014, p. 240). Semi-structured interviews were used because they provided me with the opportunity “to delve deeply into a topic and to understand thoroughly the answers provided” (Harrell & Bradley, 2009, p. 27). Semi- structured interviews included a clear guide with interview questions, however, the order of the questions could be changed and probes could be

provided “to ensure that the researcher covers the correct material” (Harrell & Bradley, 2009, p. 27). During the interview teachers were asked mainly closed questions, however, when necessary open-ended questions were also asked, so that “the participants can best voice their experiences unconstrained by any perspectives of the researcher or past research findings” (Creswell, 2014, p. 240). Open-ended questions helped participants to create many different options for responding. The interview type was one-on-one. One-on-one interviews are convenient due to more intensive contact between the researcher and the participants. Moreover, the participants were free to comfortably express and share their ideas.

An interview protocol with appropriate questions was prepared (see Appendix A). I informed participants that they could withdraw their participation from the study at any time without penalty. Each interview lasted approximately an hour in the English language, as all the chosen participants spoke English fluently. I agreed to meet the participants at a time and place convenient for them. The interviews were conducted in the classrooms of the school. Before interviewing, all four participants were introduced to a written consent form and then signed the form (see Appendix B). The interviews started with my explanation of the purpose of the study, the possible benefits for them and the confidentiality issues. Each teacher was interviewed once and all the conversations were audio-recorded on my mobile with the permission of the participant.

### **Data analysis**

This section presents the analysis of the gathered data. The audio-taped interviews were transferred from mobile into my computer. Then I converted all audio-recordings into text data. In order to make sense of this text I read through each transcript and highlighted the main ideas. The next step was the coding process (see Appendix C). According to Creswell (2014), “Coding is the process of segmenting and labeling text to form

descriptions and broad themes in the data” (p. 267). I divided the text into several segments, labeled them with codes and organized these codes into major themes (thematic analysis). Then these themes were analyzed and framed according to the research questions of this study and cross-participants comparative tables were prepared (see Appendix D). Lastly, research findings were compared with the literature.

### **Ethical considerations**

Prior to the data collection process, I prepared the ethics application, which consisted of interview protocol and informed consent, and sent it to Graduate School of Education Research Committee of Nazarbayev University in order to get permission to conduct the research. The application was approved.

The participants’ identities were protected. Their names and the name of the organization were removed from the interview notes. All documents with participants’ personal information, such as informed consent forms, audio recordings and transcriptions, were also kept in my desk drawer and computer with a password. Only I and my supervisor had access to the collected information. After the data analysis was finished, all the original information was successfully deleted.

One of the possible risks was that teachers could feel guilty and would not want to talk about their weakest points. To minimize this risk and to avoid making my participants uncomfortable, at the beginning of the interviews, I told them that they could choose not to answer any questions which made them feel uncomfortable. In addition, participants could possibly fear that if their identities were revealed they could face problems at school. In order to minimize this risk, I met the participants at a time and place convenient for them. To prevent all possible risks participants were introduced to the written consent form that included information about anonymity and confidentiality. They were informed that only I

and my supervisor knew their identity and that their names, the name of the organization would not be associated with the research findings in any way.

### **Summary**

This chapter presented detailed information on the methodology part of the research. Qualitative research design was selected in order to deeply explore teacher perceptions and experiences of PBL, its benefits and challenges. One Kazakh-Turkish Lyceum was chosen because it provided me with easy access to participants and relevant resources. Criterion sampling was used to choose four science subject teachers, who were “information rich”. Semi-structured interview was selected as the main tool for data collection. All conversations were audio-taped and transferred into my laptop. The data was transcribed and then coded into broad themes, which were later analyzed and compared with the literature. Lastly, ethical issues were discussed.

## Chapter 4. Findings

This chapter presents the findings of the research study on teacher perceptions of project-based learning and its benefits and challenges for students of a Kazakh-Turkish Lyceum in the northern part of Kazakhstan. The main research questions were the following: (1) How do secondary school teachers perceive PBL? (2) What are the benefits of using PBL? (3) What are the challenges of using PBL?

In this chapter the findings are presented under the following themes: (1) Teacher perceptions of PBL; (2) Benefits of using PBL; (3) Challenges of using PBL. At the end of this chapter, a summary of the findings on teacher perceptions of PBL is presented.

### Teacher perceptions of PBL

This section is about teacher perceptions of PBL. By ‘perception’ I mean how these teachers understand PBL, and what they think of it as a teaching strategy. Teachers’ answers to the first research question “How do you perceive PBL?” were analyzed and then categorized into the following three sub-themes: (1) Self-learning; (2) Increased engagement; (3) Better subject understanding. These subthemes will be explored in the subsequent sections.

**Self-learning.** When asked “How do you perceive PBL?” teachers had many similarities in their responses. The Computer Science, the Physics, and the English language teachers expressed the idea that during PBL students have the opportunity to learn by doing themselves. The Computer Science teacher says: “The way I understand it, you give a project, but you do not want to teach students, they *learn by themselves*, they get the idea and they learn something”. In the same way, the English language teacher also believes that project-based learning is just about directing students: “You just direct them and *students learn on their own*”. This is similar to the views of the Computer Science teacher who believes that sometimes students do not need him during PBL.

In contrast, the Chemistry teacher responded that PBL is more about teaching students. For example, he responds: “In my opinion PBL is a great way to *teach* students by giving interesting projects”. In this case, it is worth mentioning that teachers may have different background and experience; therefore some teachers can give more space and freedom (Computer Science, Physics, and English language teachers) than others (Chemistry teacher). Nevertheless, later the Chemistry teacher also highlighted the fact that PBL is more about self-learning and teachers should just support them: “It is convenient for me just to show the right direction and help them to *do the work by themselves*”.

Overall, all respondents agree that PBL is a strategy that involves students in doing the work by themselves, and providing more space and freedom for self-learning.

**Increased engagement.** Teachers claim that projects must be interesting for students. The English language teacher believes that these projects must take into account students’ interests: “It is about learning one topic and it is based on *students' interests*. To make them *get involved* in the process of learning and make them learn by themselves”. According to the last quote, we can also see that it is very important to involve students in the process of learning.

“They can learn *interesting things*. PBL will be useful in order to get their attention, to raise their *interests* in the particular subject. And they will be doing it willingly” (English language teacher). From this quote, it is clear that students can learn interesting things, which means that they are not bounded by the school curriculum. As well as this, the English language teacher highlighted the fact that PBL could be a great tool to raise students’ interests in a particular subject, which is very important today and could also be helpful to raise their academic achievement. The last point is that there will not be any need to push them, because “they will be doing it *willingly*”.

Teachers of Physics, Chemistry and Computer Science have the same points of view regarding student engagement and involvement. The Physics teacher says: "... if you give a project, pupils by doing the work themselves ... *get involved* in the process". Meanwhile, the Computer Science teacher states: "I see how students *get interested*. And I think this is a best strategy to make students do something". According to the Computer Science teacher, PBL could be a good motivation to do something (the work), because they get interested in it.

In sum, all teachers emphasize the importance of students being interested in their own learning. Moreover, they agree that if students get interested in doing projects they will be highly involved in the process of learning. This suggests that highly engaged and involved students may even understand the topic more deeply and have a higher academic performance.

**Better subject understanding.** This section provides information on how teachers perceive PBL in terms of subject understanding. Mostly teachers had a positive attitude towards the impact of PBL on a better understanding of their subjects.

The Chemistry teacher says, "I think students develop their skills during PBL and get the opportunity to *understand difficult Chemistry topics*". This means that PBL is perceived as a great teaching strategy that is useful in explaining various topics that are difficult to understand on traditional lessons.

In a very similar manner, it is described by the Physics teacher, who says:

PBL is a good method for teaching students. Because when you teach only the theory, *it is not enough for them to get the full information on the topic*, but if you give a project, pupils by doing the work themselves will better understand it.  
(Physics teacher)

This demonstrates that PBL provides students with extra opportunities to practice the theoretical knowledge that they get during lessons and fully understand it.

It is very interesting to consider the English teacher's opinion: "Some students fail exams and in order to get good marks they can take PBL and prove to teacher that they are the right students to get excellent marks...But mainly PBL is good for weak students". The given quote might indicate that PBL is a different way of giving good marks for weak students. Moreover, according to him, students have the opportunity to show that they understood about the topic in a slightly different way.

Based on the teachers' responses, the most crucial difference is that science teachers admit that PBL is useful in helping students better understand difficult topics (Chemistry teacher), practice theories and concepts that they learned during lessons (Physics teacher), giving them motivation to study by themselves (Computer Science teacher). However, the English language teacher believes that PBL is mainly for weak students, giving them a chance to achieve higher marks by conducting projects. This result might be an indication of the difference of using PBL between science subject teachers and language teachers.

To sum up, teachers perceive PBL as a positive strategy to help students get involved and motivated to study subjects but in a different manner. Moreover, according to their responses, PBL appears to be focused on self-learning, providing students with more freedom and space, which makes them more responsible for the work they are doing. And the most important point about PBL is that it helps students to more deeply understand the subject or particular topics.

### **Benefits of using PBL**

This theme provides information on the benefits of using PBL from the perspective of teachers. The theme consists of the following two subthemes: (1) Benefits of using PBL for teachers; (2) Benefits of using PBL for students.



**Benefits of using PBL for teachers.** The identified benefits indicated in this study are: (1) Improved discipline and (2) Better teacher-students relations.

**Improved discipline.** Teachers reply that PBL is beneficial for them in terms of creating a pleasant atmosphere in the class and keeping discipline. For example, regarding this the English language teacher says: “It is students' task to do everything. In this case, it would be easier for the teacher *to control them*”. This suggests that while the most part of the work is done by students, therefore, it is easier for teacher to organize students and keep discipline.

The Physics teacher says: “During PBL students do not interrupt each other and it is easier for me to *organize students* for group work”. In this case, we can see that teacher indicates the use of PBL in maintaining discipline in class and to manage his students to work in groups.

There is a slightly different point of view from the Computer Science teacher who believes that PBL helps to better know and learn about every student:

On lessons, you do not know students well. You just give them ready material, but when you do the PBL, there are a lot of opportunities for you *to get to know* the students. It gets easier for you to *find common points* between you and your students. You can easily *control* and motivate your students. (Computer Science teacher)

This response also shows that the Computer Science teacher motivates his students, facilitates their learning and is able to organize them through getting to know them and finding common points.

In conclusion, based on the teachers' responses, it is worthwhile to mention that PBL is helpful to create that pleasant collaborative atmosphere in the classroom in order to keep discipline and encourage students to take ownership of their own learning.

**Better teacher-student relations.** One of the most important benefits of using PBL for teachers might be the creation of good relationships with students. It might be vital due

to the fact that deeper the relations they have with their students and the more profoundly they know them, the more open students may be with them, and as a result, teachers might probably be more able to help them with their problems. According to the responses, all teachers in diverse ways indicate that PBL provides them with the opportunity to establish very good relationships with their students, which possibly leads to a more pleasant and collaborative atmosphere in the classroom. This in turn may encourage students to delve more profoundly into their project work and foster an atmosphere of collegiality and inquiry which supports the teaching and learning process.

For example, the English language teacher regarding the relationships with students claims: “You get closer to your students, create warm relationships with them and there is more trust between you and them. And when you give any tasks they do it with pleasure!” It is crucial to trust and have a trust with your students, as they will probably be more open and honest with the teacher. Based on the response, we can suggest that students do the given tasks with more pleasure, which makes it easier to work with them.

The Physics teacher adds more light on the issue of relationships, saying:

Relationships with students get better because you start to work with every student individually. Students who were not so close to me became much closer, as I started to negotiate with all of them, especially with those who come and ask different questions and I help them. (Physics teacher)

This suggests that teachers may have better relationships with their students when they focus on an individual approach. When a teacher works with the whole class, it is much more difficult to negotiate with every student and help them with their questions and problems. Moreover, the Computer Science teacher also positively responds to this problem: “I can really feel that we got closer to students. By solving social problems, we learned many new things about them”.

To sum up, all teachers agree that PBL helps them create better relationships with their students, learn a lot about them and help them with their questions and problems.

**Benefits of using PBL for students.** The previous section presented benefits of using PBL for teachers and this section deals with benefits for students. Based on the teachers' responses the most important benefits of using PBL for students are the following ones: (1) Skill improvement, (2) Real-world practice, and (3) Better relationships among students.

*Skill improvement.* Most teachers believe that PBL helps students improve certain skills. For example, regarding this the Chemistry teacher says: "Students develop their *21st-century skills*, such as *communication, creativity, and critical thinking skills*. They work in groups and have the opportunity to help each other because stronger students help weaker classmates to understand particular topics on Chemistry". He claims that students working in groups could probably develop their communication skills, especially when they help each other. This suggests that while stronger students help the weaker ones they could also improve their mentoring skills. When students work in groups they may have different ideas and thoughts on particular topics. As a result, it could improve their creativity and critical thinking skills, as they will be free to discuss any upcoming ideas on the topic.

In the same way, the English language teacher sheds more light on this perspective: "In this case, students will think not in the way you teach them, but they *will get out of the box*, they can have many great ideas". This suggests that students do not have to learn only what a teacher teaches; they have more space and freedom to be creative.

Regarding skill improvement the Physics teacher says: "In my opinion, the most important benefit for students is that they can *develop their hidden skills*... They also *improve different skills, such as presentation and collaboration skills*". It is worth

mentioning that he highlights the fact that the skills are hidden, which probably indicates that they may not develop these skills unless they engage in PBL. Moreover, the Physics teacher mentions presentation skills, which are improved when students present their project works.

As can be seen from the responses, teachers believe that PBL helps students improve in several skill areas, become more creative and provides them with the opportunity to have new ideas and share them with each other.

***Real-world practice.*** One of the most important benefits of using PBL for students is the practice, as PBL provides them with the opportunity to go to the field and do the practical part of the project work. It is especially widespread in science subjects, such as Computer Science, Biology, Physics and Chemistry. Regarding the practice the Physics teacher says: “In theory, it is not interesting for them, but when they *do it by their hands* it becomes more useful and engaging for them”. Moreover, he adds:

...when you teach only the theory, it is not enough for them to get the full information on the topic, but if you give a project, *pupils by doing the work themselves* will better understand it and get involved in the process. (Physics teacher)

Based on his answer, it can be suggested that practice during PBL engages and involves students in their own learning, as well as helps them to understand the subject in greater depth.

This is reflected in the response of another teacher:

I think that PBL can be used not only in subjects, it can be some type of social area for interesting things you want to know, like *surveys, public opinion*. For example, how to improve your school if you have 50000 tenge... The last project that 11 graders made was about asking people why they say thank you. And it was interesting to find out that one man said that he never says thanks. PBL can help us to think how we can *make this world better*. (English language teacher)

According to him, students are not bounded merely by defined subjects, but they can observe anything they want, any area that might be interesting for them. It can be

surveys, public opinions, and other real-world problems. Moreover, the English language teacher added that PBL could even be used to make this world better by solving real existing problems.

Concerning the real-world practice the Computer Science teacher says: "... *solving real problems*, make them feel so serious and confident". Students trying to deal with real existing issues will possibly be very serious about them and understand all upcoming consequences of their activities. As a result, it might raise the level of responsibility for their project works.

In addition, the Computer Science teacher gives an example: "...last year we tried to pay attention to disabled people. In this case, we showed students *social problems*; we tried to make them interested in that". This example proves that PBL could become a great tool for students to use their skills in solving real existing problems and helping people in real life.

In sum, it was described by respondents that students are more engaged and involved in the learning process when they have enough real-world practice. Moreover, real-world issues are more interesting for students, as they may feel that they can be helpful in solving meaningful and existing problems, therefore take responsibility for their work.

***Better relationship between students.*** PBL provides teachers with opportunities to better know and have a good relationship with their students, which might be helpful for teachers in managing, organizing and guiding the class. Another benefit to mention is that PBL also helps students be friendlier with each other and support their peers within each group. As PBL is a group work approach, students have a common task to finish and this possibly suggests that students within every group will try to equally contribute to the project and help their group mates when necessary.

The Computer Science teacher says on this issue: “working as a group they share ideas, *listen to partners, trying to understand them, find the common points*”. Based on his statement, students in groups support group mates, listen to them and try to find common points. This suggests that by helping and sharing, students may have better relationships with each other.

The Chemistry teacher mentions that students working in groups support each other and explain difficult topics to those who do not understand sometimes even better than him. As a result, this indicates that while students help each other, they may have better relations with their peers.

The Physics teacher regarding this issue claims: “It was really useful for me because *strong students helped weak ones... Moreover, they have a better relationship with their friends* during PBL”. As in all responses, the Physics teacher believes that PBL provides students with the opportunity to work in groups and support each other. This demonstrates that there is a strong relation between support and stronger relationships. PBL creates that positive and pleasant collaborative environment for learning which helps students to work more effectively and help each other grow within their groups.

To sum up, there are many benefits for students using PBL and the most important ones are as follows: the improvement of certain skills, opportunity to deal with real practical work and better relationship with peers. However, there are also some extra advantages of using PBL for students. For example, the English language teacher says: “*Shy students can show their abilities*”. This could suggest that PBL welcomes diversity and helps various students express themselves in a different manner. As well as this, he mentions parental satisfaction: “Of course it is also very useful when you show to their *parents* what they have done, they would get really *satisfied*”. It is very important that parents see the success of their children and get satisfied.

One of the most crucial benefits for students might be the use of the gained skills and abilities at university. Regarding this, the Computer Science teacher says: “I think when they go to *university* it will be easier for them to make different projects because they have learned all the necessary strategies”.

According to all of the quotes, PBL is beneficial for students in many aspects; however, there are also some challenges they face while using PBL, which are discussed in the next section.

### **Challenges of using PBL**

This theme presents data on the most important challenges that teachers and students face during PBL according to the teachers’ responses. It is divided into two subthemes: (1) Challenges of using PBL for teachers and (2) Challenges of using PBL for students. It is worth mentioning that challenges that teachers face are in many cases similar to those students have.

**Challenges of using PBL for teachers.** There were different teacher difficulties mentioned in the interviews by the respondents, however, this section will present the most common and often faced challenges by all teachers during PBL implementation. They are (1) Lack of time and (2) Lack of knowledge.

**Lack of time.** All teachers complained about the lack of time. For example, the Computer Science teacher says: “...there is a problem concerning the materials and *time*. We had to *find time after lessons*. You can be tired after lessons”. The Chemistry teacher says: “I think the major difficulty for me is also *the lack of time* and energy because I should spend *more time of my own* after lessons to work on PBL, which makes me become more tired”. Teachers of English language and Physics reported similarly.

The similarity in the responses of teachers shows that they all believe that PBL requires them to spend their extra time after lessons. This suggests that teachers have their own lessons and after that deal with PBL, which makes them tired.

Based on teachers' statements, the lack of time is considered as a huge problem that teachers face during PBL. Due to the fact that teachers have to spend their own time after lessons in order to deal with PBL, they probably become more tired, which may affect their mood and effectiveness. Moreover, they may possibly have less time to devote to other areas of their lives.

***Lack of knowledge.*** Teachers may have some difficulties while implementing PBL because of the lack of appropriate knowledge of it. The English language teacher sheds more light on this:

I did not know how to start, what should be our aim? Sometimes we were looking for very difficult topics. Also when the teacher *does not understand himself*, it is hard to explain it to students and they do not understand what teacher wants from them. (English language teacher)

First of all, it is vital for teachers to understand all about PBL implementation, how to ask driving questions and how to choose the right topic. This is because they are the ones who should support and direct students during all phases of their project work. Moreover, the English language teacher claimed: "Sometimes students do not know how to put questions, some struggle in analyzing surveys. They can easily make a video but be bad at analyzing the results". This probably indicates that students may have different problems while dealing with PBL and the responsibility of the teacher is to be able and ready to support students regarding these problems in a short period of time. However, to do so, they must firstly get the necessary knowledge of PBL and have enough experience on it.



The Computer Science teacher explained: “It is hard to work with real problems. The example is the project about people with disabilities”. According to this, it is possible that there is a lack of knowledge on conducting PBL related to real-world issues. This suggests that lack of appropriate knowledge could depend on the topic that students choose.

The Chemistry teacher has a different perspective on this problem: “As well as this, when students do all the work by themselves, I feel that they do not need me”. In this case, the point is that teacher probably does not have enough knowledge and experience on how much scaffolding to provide, as it is a new role of facilitator for him. This might be different from the way he teaches his lessons.

In conclusion, teachers due to the fact that they do not have enough appropriate knowledge and experience of PBL, can face certain problems at different steps of PBL, such as choosing right topics, posing correct driving questions, collecting data, and data analysis. Moreover, teachers may struggle while working with real-world problems. Another concern is the new role for teachers who should be acting more like mentors and advisors rather than lecturers. Teachers should provide the appropriate amount of freedom and independence to their students so that they will work on their own. These all possibly indicate the importance of having the necessary information on PBL before conducting it in order to overcome many obstacles before they rise.

**Challenges of using PBL for students.** As well as teachers, learners also come face to face with a few obstacles. This section presents teachers’ perspectives regarding the challenges that students face while conducting PBL. It is divided into three parts: (1) Lack of time, (2) Lack of resources, and (3) Free-riding. It is worthwhile to mention that lack of time is considered a challenge for both teachers and students. Moreover, other challenges may interrelate and have common points for teachers and students.

**Lack of time.** Teachers complained several times about the lack of time for their students. For example, the Computer Science teacher complains about this problem: “Nowadays students *do not have enough time* for projects. They have a lot of homework on other subjects”. According to the response of the Computer Science teacher, the main reason for this problem might be the amount of homework they have to deal with. This suggests that students are left with not enough time for their projects.

The Chemistry and the English language teachers have the same opinions regarding the time issue. The English language teacher complains: “PBL requires *extra time after lessons*”, whereas the Chemistry teacher adds: “...students have to spend their extra time after lessons, which make them tired”. Moreover, the Physics teacher highlights the fact that students sometimes do not submit their works on time. This probably indicates that the reason could be lack of time or tiredness. In sum, according to the teachers’ responses, lack of time is considered a serious problem for students.

**Lack of resources.** Teachers also mention the lack of resources necessary to conduct PBL. For example, the Computer Science teacher claims: “there is a problem concerning the *materials*”. The English language teacher and the Physics teacher also mention to be a similar problem. It is possible to suggest that the materials schools have are not enough for students to conduct PBL, which requires them to buy these materials. Regarding this problem, the Chemistry teacher says: “there are some financial problems. In order to work on PBL, we need more money to get *necessary materials and tools*. Students cannot afford some expensive experiments”. Moreover, it is worth pointing out that the lack of resources might depend on the subject and the topic of the project that students conduct. For example, projects about recreating some complicated experiments, constructing or building different structures or robots (which are popular in science subjects) may require more budget and instruments.

In conclusion, the lack of resources might be a significant concern for students who deal with PBL. While the English language and the Computer Science teachers just mention a little on this issue, the Chemistry teacher believes that schools need more finances to buy necessary materials in order to conduct some expensive experiments on PBL.

***Free-riding.*** It was very interesting to find out this kind of problem. In the previous section about the benefits of using PBL, it was mentioned that students work in groups and support each other, stronger students explain difficult topics to weaker classmates and teachers have more time to monitor students' progress and facilitate interactions around learning, as students do the majority of the work. However, teachers while answering the question on the challenges of using PBL complain about the difficulties of working with groups, as there is an unequal contribution from certain students within the group, therefore, other students have to work more. Regarding this issue, the Physics teacher says: "One more problem was that there were some *free-riders*, that did not want to do the work in group honestly, thus other students in their groups did more work than necessary". The Chemistry teacher sheds more light on this problem: "Also it is hard for me to organize and evaluate some students that *do less work than others*". According to this answer, the Chemistry teacher lacks might lack appropriate knowledge on how to organize students for group work.

To sum up, the main challenges that students face during PBL are as follows: the lack of time and unequal contribution from several students in the group. Of course, there are many other challenges that both teachers and students may face while using PBL. It worthwhile to mention that the variety of difficulties might depend on the subject, the topic students choose, teachers' background, and experience regarding PBL implementation, and many other factors.

## **Chapter 5. Discussion**

The purpose of this qualitative study was to explore secondary school teacher perceptions regarding PBL, its benefits and challenges. In the previous chapter major findings of my study were reported. The results demonstrated teachers' positive attitudes and beliefs about PBL. The participants perceived PBL through its benefits and challenges, which were discussed in detail.

This chapter provides the interpretation and explanation of the mentioned findings. As well as this, it compares the results of my study to those reported in the literature review. The discussion chapter is divided into three sections according to the research questions: (1) Teacher perceptions regarding PBL, (2) Benefits of using PBL, and (3) Challenges of using PBL.

### **Teacher perceptions regarding PBL**

According to findings, all four teachers seemed to have positive attitudes towards using PBL. They perceived PBL as a valuable process, highlighting the variety of benefits they and their students had while using this approach, as well as in a negative aspect, listing different challenges they faced during PBL implementation. These findings are similar to those of other researchers who also studied teacher perceptions and experiences regarding PBL (Baysura et al., 2016; Habók & Nagy, 2016; Harrigan, 2014; Hovey & Ferguson, 2014; Hugerat, 2016; Tamim & Grant, 2013; Van den Bergh, 2006).

Teachers of this study perceived PBL through the following aspects: self-learning, student engagement, and a deeper understanding of the subject. All four participants emphasized the importance of self-learning highlighting the fact that PBL is more a student-centered approach rather than a teacher-centered one. These results are consistent with the findings of Hugerat (2006) who states that "learning by doing" and "child-

centered-learning” are the core values of PBL (p. 393). Moreover, the participants claimed that PBL provides learners with opportunities to do the work by themselves, which helps them get involved in their own learning. Scholars also emphasize the importance of hands-on approach to content (Holm, 2011) and learning by doing in PBL, which results in a deeper learning and understanding (Bas, 2011; Baumgartner & Zabin, 2008; Baysura et al., 2016; Krajcik & Blumenfeld, 2006; Thomas, 2000).

In addition to self-learning, teachers perceived PBL through increased engagement. All four respondents reported that projects should be engaging for students and take into consideration their area of interests. Regarding this issue Krajcik and Blumenfeld (2006), and Thomas (2000) stated that PBL became a great tool to engage learners, who were often bored on lessons. Teachers reported that they gave interesting projects to their students to raise their motivation. This is similar to Yam and Rossini’s (2010) beliefs about teachers being the key figures in motivating students and creating a pleasant collaborative atmosphere in the classroom. On the other hand, it is worth mentioning that Shachar and Fisher (2004) demonstrated that PBL approach decreased the motivation of high school students because it was based on team work (as cited in Baumgartner & Zabin, 2008). This matches the findings of my study, as teachers complained about challenges in group work, such as unequal contribution and free-riding. This suggests that Kazakhstani students may not be used to work in groups very often, therefore it can be challenging for them and decrease their motivation.

Lastly teachers perceived PBL through deeper understanding of the subject. It was interesting to find out that PBL helps students understand difficult topics. However, it was reported only by one participant (the Chemistry teacher) and this probably suggests that it differs according to the topic, subject or the teacher. It might be possible that students do not fully grasp the topic and content of the lesson that is taught traditionally; however, PBL

can provide necessary opportunities for them in order to burrow down into the topic (content), investigate it deeply and better understand all peculiarities. The literature supports this understanding of PBL, confirming that PBL provides learners with opportunities to more deeply investigate the topic they are interested in (Baş, 2011; Baumgartner & Zabin, 2008; Bell, 2010; Harrigan, 2014; Holm, 2011; Rogers, 2014; Tamim & Grant, 2013; Van den Bergh et al., 2006).

At the same time, the Physics teacher reported that students better understood the content because PBL provided them with enough practice. Regarding this issue many scholars also reported that PBL fostered students' greater understanding of the subject content through practice (Baş, 2011; Baumgartner & Zabin, 2008; Bell, 2010; Krajcik & Blumenfeld, 2006; Larmer et al., 2015; Van den Bergh et al., 2006). These results demonstrate that all participants perceived PBL in terms of more profound subject understanding in various ways. This might indicate that effect of PBL approach can vary according to different subjects, topics or even the background and experience of teachers.

One of the unexpected findings of my study is that PBL was perceived as an approach that was often used by weak students who failed exams or got low marks on lessons (English language teacher). This might suggest that PBL can be perceived as a different way to get good marks by students who struggle to get them in a traditional way during lessons. This probably indicates that PBL might be a great approach for diverse students to show their understanding of the subject in diverse ways. As a result, students may get chance to improve their grades by doing projects on the topic or subject with which they have problems.

Even though many scholars found that PBL significantly increases academic achievement, participants of this study mentioned very little on this area, claiming that

PBL is beneficial mostly for weak students to improve their marks. One of the reasons might be that PBL is not considered a mandatory part of the curriculum in this school. PBL was introduced with the main goal to prepare KTL students for various project competitions, such as YIPC (Young Inventors Project Competition) (McCarthy, 2006). For example, this year (2017) KATEV foundation organized YIPC in Astana among all KTL students within preparation to EXPO 2017 (<https://strategy2050.kz/en/news/8490>). Their success on project competitions suggest that PBL is an effective tool and could possibly be embedded into the curriculum.

Furthermore, while teacher collaboration was one of the most important benefits of PBL in international research (Thomas, 2000), none of the teachers participating in this study mentioned it. In fact, other studies claim that collaboration with colleagues helps teachers acquire inter-disciplinary subject knowledge (Frank & Barzilai, 2004, as cited in Nicola & Alison, 2014). There might be two possible implications for the lack of collaboration between teachers in the implementation of PBL in Kazakhstani schools. On the one hand, it seems that Kazakhstani teachers implement PBL only in their own subjects and do not collaborate with each other on PBL issues. On the other hand, it might suggest that students mostly deal with problems that do not require inter-disciplinary knowledge. This could be a direction to improve PBL implementation in Kazakhstan.

### **Benefits of using PBL**

The participants of my research study perceived many different benefits of using PBL. They highlight that PBL improves teacher-student and student-student relationships that creates a pleasant collaborative environment in the classroom and contributes to better discipline. Furthermore, they mention that PBL provides real-world practice and contributes to skill development.

**PBL improves the relationship between teachers and students.** According to teachers' responses, PBL helped teachers have better relationships with their students and get to know them. It is true that closer relationships are beneficial for both teachers and students. In this regard, Van den Bergh et al. (2006) states: "There is an occasion for both parties – students and instructors –to cooperate more closely: they come to know each other better and become more personally and informally involved" (p. 354). It is highly possible that better relations could be a result of more close negotiation between teachers and students. As one teacher (Physics teacher) highlighted, he had a better relationship with his students because of the individual approach in PBL, having a chance to work closely with every student, especially with those students who needed help the most. The Computer Science teacher claimed that while he was negotiating with students one-on-one he learned a lot about them, their identities, and characters, personal and intrapersonal problems. Moreover, teachers reported about the increased trust between teachers and students during PBL. In the same way, Kubiatio and Vaculová (2011) claim that PBL "promotes mutual respect, support, and understanding, making an impact on student-student and student-instructor relationships" (p. 68). This probably indicates that teachers have a great chance not only to help their students in implementing PBL but also to get to know them better, learn their weak sides and even help them solve various problems in other areas of their lives. This could be even more important than the final project work. As a result, PBL improved the relationships between learners and their instructors.

It is highly possible that the relationship between teachers and students improved because of the PBL structure, as it is based on team work. The collaboration within each group during PBL provides students with opportunities to share ideas and learn from each other. It is obvious that sometimes students may struggle to ask help from a teacher in front of the whole class. However, these "shy" students can easily get support from peers within



the group or ask the teacher to help within only his or her group. This is a very crucial advantage that PBL provides for them. Another point to note is that PBL makes it possible for teachers to stay concentrated on the problem of every group without losing attention, as it can be difficult to work with the whole class at once.

**PBL improves the relationship among students.** Another significant issue is that PBL also improves the relationship among students. According to the answers of my participants, relations are improved between students working in groups. It became obvious from the responses that students having one common project work to finish felt more responsible for each other and tried to equally contribute to the work. The group work nature of PBL might be the key factor that improves the student-student relationship. It motivates students within every group to support each other in order to have a better final grade. The common project makes them unite and work as one whole organism. It is possible that students working in groups have better relationships within these groups because while they negotiate with each other on the problem they also get opportunities to better know each other and become friendlier. They learn to divide roles in the group, communicate, listen to their partners and share ideas. It is consistent with the findings of Van den Bergh et al. (2006), who highlights that one of the most important benefits of PBL is that students learn how to deal with conflicts between group members within each group (p. 353).

One of the unique aspects of this study is that weaker students benefit the most, as they always may get help from stronger students within the groups. There is even a claim from the Chemistry teacher that sometimes strong students within groups explain difficult topics to their peers even better than the teacher. This might be possible because students within every group investigate much about the problem and may know even more than the teacher on that particular topic. It is evident from studies of scholars who highlight the fact

that PBL provides students with deeper learning and better understanding of the subject content (Baş, 2011; Baumgartner & Zabin, 2008; Bell, 2010; Krajcik & Blumenfeld, 2006; Larmer et al., 2015; Van den Bergh et al., 2006).

Lastly, it is worth pointing out the contribution of improved teacher-student and student-student relationships to the overall positive atmosphere in the classroom.

**PBL helps teachers keep discipline and maintain a pleasant atmosphere in the classroom.** Better relationships between teacher and students, as well as among students within the groups may become the reason for improving discipline and creating a positive environment in the classroom. According to Bell (2010) discipline is one of the three main outcomes of PBL. It is worthwhile to mention that teachers in this study perceived PBL as a suitable approach that helps them keep discipline in the classroom, organize students in groups and control them easily. Furthermore, Habók and Nagy (2016) found that maintaining discipline was more important for traditional instruction than for PBL, where students did not need much supervision, as they were busy with their own learning, solve real, existing and meaningful problems that are interesting for them. It is worth highlighting that students who are engaged in learning would not be interested or even have time to interrupt others and disrupt the climate in the classroom. This result is consistent with the findings of Hugerat (2016), who found that PBL students are more actively engaged and involved in their own learning than students during traditional lessons, which helped teachers perceive the overall atmosphere in the classroom as less tense and less difficult.

Based on the responses of Physics, English language and Computer Science teachers regarding the benefits for teachers, it is clear that Kazakhstani teachers are mostly concerned about the discipline and pleasant atmosphere in the classroom, where students

do not interrupt each other and feel comfortable to study. One of the reasons could be that during traditional lessons teachers face many disciplinary problems (OECD, 2011). In order to engage students in learning it is vital to create a positive environment in the classroom. According to PISA results, a pleasant atmosphere in the classroom positively affects students' academic achievement and their engagement in learning (OECD, 2011). Another reason why Kazakhstani teachers care much about the discipline and pleasant atmosphere in the classroom might be the importance of these factors for teachers in the context of Kazakhstan. Kazakhstan's history is highly interconnected with USSR. The Soviet Era had left an enormous impact on many areas of life in Kazakhstan and the sphere of education is no exception. Teachers in Soviet times were considered the main figures in the classroom and lessons were constructed in a teacher-centered manner (de la Sablonnière, Taylor, & Sadykova, 2009). It seems that some aspects of Soviet pedagogy, in which teachers still persist in the contemporary Kazakhstan.

It was interesting to find the similarity between the findings of this study compared to what Habók and Nagy (2016) found in terms of discipline. They studied in-service teachers' perceptions towards PBL and reported that controlling students and keeping discipline were considered very important mostly by beginner teachers. The participants of my study are also very young teachers with teaching experience ranging from one to seven years. It seems that teachers are concerned about discipline in the beginning years of their teaching career; however, later they probably get experience on maintaining discipline and become good at controlling students. Therefore, it might become a habit and they do not pay much attention to it.

The unique aspect of this study is that Kazakhstani teachers are more concerned about the discipline and pleasant atmosphere in the classroom. Discipline and classroom management issues are also mentioned in international studies; however they are not much

important, as they are mostly concerned about motivation, collaboration and academic achievement (Baş, 2011; Baumgartner & Zabin, 2008; Frank et al., 2003; Krajcik & Blumenfeld, 2006; Kubiato & Vaculová, 2011).

**PBL develops certain skills and abilities in students.** Teachers reported that PBL improves students' skills and abilities, providing many different examples. It seems they are not aware of all the variety of these skills; however, they listed the most popular 21<sup>st</sup>-century skills, such as creativity, critical thinking, communication and collaboration skills, and presentation skills. It is interesting to note that skills mentioned by my participants appear within the top twelve most frequent skills identified in the PBL literature (Nicola & Allison, 2014). Only the presentation skills were not found in that list.

One of the most important findings of my study is that PBL provides students with opportunities to reveal and develop "hidden" skills (according to the Physics teacher). In this regard, Tamim and Grant (2013) state that "different abilities of the students were unveiled that would otherwise remain unnoticed in a traditional learning and testing environment" (p. 82). This probably indicates that students have many different skills and abilities that could be noticed and developed by using PBL. It seems that PBL creates that atmosphere suitable for these hidden skills to be revealed and improved. However, it does not mean that these skills and abilities are revealed only during PBL, and cannot be developed when other activities or teaching approaches are employed.

Another major finding is that students "get out of the box" (English language teacher), which possibly indicates that PBL makes it easy for students to learn more than just the teacher provides and explains. This might improve their creativity skills (Bell, 2010). During traditional lessons students are bounded by the subject content of the curriculum given by teachers, however, dealing with authentic PBL tasks requires students

to search more deeply and learn more on that particular problem or topic (Bell, 2010; Tamim & Grant, 2013; Thomas & Mergendoller, 2000). As a result, students may become more creative and become very knowledgeable on the topic.

Moreover, literature states that PBL also helps students gain interdisciplinary skills (Larmer et al., 2015; Thomas, 2000). In order to help their students gain these skills teachers collaborate with their colleagues from other subjects and discuss the similarities and differences found between their projects. As a result, they acquire interdisciplinary subject knowledge, which helps them when they deal with real-world issues that require a combination of various subject concepts. However, participants of this study did not mention any collaboration among their colleagues to deal with PBL. Teachers once again might need to look at interdisciplinary collaboration, as it provides from opportunities for developing interdisciplinary skills in their students.

It is worthwhile to mention that skills gained through PBL could be useful for learners in the future. According to the Computer Science teacher, students probably could be more successful at university and future jobs because of the skills and strategies they have gained while implementing PBL at school. The point is not about the theoretical content of certain subjects, but it is more about learned skills and abilities. Similarly, Harrigan (2014) found that PBL also prepares students for future job markets. Moreover, Bell (2010) emphasizes the importance of PBL in developing necessary skills in students and preparing them for success in the 21<sup>st</sup> century.

**PBL provides students with real-world practice.** Based on the responses of teachers it seems that one of the key advantages of PBL is that this approach requires students to go to the field and do the practical part of the project. Students learn more while engaging in a hands-on approach. Similarly, regarding this issue, Kubiato and Vaculová

(2011) claimed that the first step to successfully integrate PBL into the classroom is *practice-based nature of knowledge and learning*. This suggests that practice plays a huge role in the PBL implementation.

It is important to highlight that the majority of skills and abilities are revealed and improved through practice during PBL. This is mentioned by the English language teacher, who believes that various students' talents could be revealed and developed only through practical activities of PBL. These talents and skills might help learners become better problem solvers and researchers (Bell, 2010), and even succeed in their future professional life (Rogers, 2014). According to Larmer et al. (2015), "PBL prepares students for college, careers, and citizenship" (p. 2). Moreover, Frank et al. (2003) state that students who are taught engineering and technology could be best trained and prepared for their future profession by practicing PBL. This probably indicates that PBL creates that professional environment suitable for learners to practice their skills before they start their careers.

Furthermore, the Physics teacher adds that as students do "hands-on work", it becomes more engaging for them. This is consistent with the findings of Baumgartner and Zabin (2008), who claimed that practicing increases student engagement and improves their ability to do science. As well as this, according to teacher responses, theoretical knowledge may not provide students with enough detailed information on the topic, therefore they probably need the practical part of PBL. It is worth noting that Baumgartner and Zabin (2008) also highlight the importance of practice during PBL in increasing the depth of understanding. Moreover, Bell (2010) adds that practice could deepen learning for students if it includes real-world problems.

It was interesting to find out how the English language teacher perceives PBL in terms of practice. According to him, during PBL students are not bounded by only subject content, they can observe anything they want, any area that might be interesting to them. It

can be surveys, public opinions, and other real investigative activities. Krajcik and Blumenfeld (2006) claim that PBL activities are organized around meaningful problems that are important to them. Moreover, they add that during PBL students are involved in real-world activities like adult professionals are. This all probably demonstrates that students have a chance to go beyond the curriculum of the school. In this regard, Larmer and Mergendoller (2010) believe that students should not just copy information from books and the Internet onto a poster. According to them, PBL provides students with real inquiries that help them find answers to the questions that are important and exciting to them, which might lead them to new findings and ideas. As a result, students have a chance to find their own conclusions and answers to the problem.

Furthermore, it is worth noting that while mentioning practice during PBL, half the participants emphasized the importance of dealing with real-world issues. According to them, PBL provides students with opportunities to conduct real inquiries and try to solve the existing problems. This possibly suggests that PBL could serve as a bridge between the school and the real world. Baumgartner and Zabin (2008) mention that “PBL can make learning relevant to the real world” (p. 98) and Rogers (2014) claims that “PBL provides the ideal platform to model the real world” (p. 49).

Regarding real-world practice, the Computer Science teacher also highlights that students practicing PBL have a chance to solve existing problems and help people in real life. He provided an example of the project, which was about helping disabled people. Similarly, Larmer and Mergendoller (2010) believe that learners during PBL should create real products, which later could be used by people outside the school. This all possibly suggests that students by engaging in real-world activities can solve existing problems, help people and as a result, make this world better.

### **Challenges of using PBL**

Even though teachers perceived PBL through many benefits, they highlighted various obstacles while implementing PBL. The most frequently mentioned challenges are the lack of time, lack of knowledge, and group work problems. Many challenges are common for both teachers and students; therefore they are not presented separately, as was done in the findings section.

The challenges section is divided into the following themes: (1) Lack of time, (2) Lack of knowledge, (3) Group work problems, and (4) Other challenges.

**Lack of time.** According to my participants' responses, it was found that lack of time is considered a problem for both teachers and students. It is consistent with the findings of other studies (Van den Bergh et al., 2006). As all teachers mentioned this problem, it suggests that lack of time is one of the most significant problems in PBL implementation. Three of four teachers highlighted the fact that PBL requires them to spend extra time after lessons. This could also indicate that teachers spending their own time after lessons to conduct PBL will likely have less time to devote to other important aspects of life, such as family, hobbies, and home tasks. Furthermore, they complained that dealing with PBL made them grow tired. This probably suggests that PBL being implemented during the lesson time might not be so problematic for teachers. According to Baysura et al. (2016), some teachers refused to implement PBL because of lack of time and increased workload; however, the findings of my study do not report this. This demonstrates that Kazakhstani teachers are likely to be more stress-resistant in terms of the time issue and can work even in the conditions of the limited time.

Moreover, teachers reported that students also have a problem concerning time. The Physics teacher mentioned that some students were lazy and procrastinated, which suggests



that students did not do the project on time and later tried to finish it when the deadline was near. As a result, they were unlikely to submit their projects on time or the quality of their tasks was low. One of the possible solutions for the problem of procrastination was mentioned by Habok and Nagy (2016), who highlighted the fact that teachers should focus on time-management and planning PBL properly from the beginning.

In sum, the lack of time is considered one of the most significant issues for both teachers and students. It is probably because they need to spend their own time after lessons. This might make them exhausted and could even impact their mood. Moreover, spending extra time might also mean that they will probably have less time to devote to other important areas of their life. Meanwhile, the time issue for students can be in the form of procrastination and little time left for projects because of too much homework.

**Lack of knowledge.** Three of four teachers complained about the lack of appropriate knowledge for PBL implementation in different ways. The English language teacher reported about problems with selecting the right driving questions and choosing the appropriate topic for the project. He indicated that these problems were faced both by him and his students. This probably suggests that the whole project might go wrong if the right question is not stated or the topic is not chosen correctly. It is worth pointing out that the English language teacher self-reflected claiming that if the teacher does not understand the process himself, it is difficult to explain to students, as they may not understand what they are required to do. This demonstrates that the teacher identified the problem but does not possibly know how to deal with it. As a result, this could be an indication of the lack of appropriate knowledge and training on PBL implementation for teachers.

Furthermore, while the English language teacher highlighted that students were good at the practical part of PBL, such as making videos, conducting surveys, the

Computer Science teacher mentioned the challenge of dealing with real existing issues, providing the example of the project about helping people with disabilities. This might be also an indication of the lack of necessary knowledge, skills, and experience on conducting PBL related to real-world problems. In this case, one of the possible explanations could be that teachers are used to providing everything readily to their students (Frank et al., 2003). Therefore, students may struggle when it comes to dealing with some new problems.

Another difficulty is the lack of knowledge of scaffolding and facilitating students, which was mentioned by the Chemistry teacher. He reported that students had too much autonomy and freedom while implementing PBL. Baysura et al. (2016) found similar results related to this problem and pointed out that teachers lack skills in providing students with the right amount of freedom for self-study. This probably suggests that teachers who are used to teach in a teacher-oriented manner cannot shift to a student-centered approach easily, which is widely used in PBL. This finding is consistent with the results of scholars, who claimed that the shift of teachers to the new role of advisor can be a huge challenge (Bender, 2012; Markham et al., 2003; as cited in Harris, 2014) and this shift must be gradual (Ertmer & Simons, 2006, as cited in Tally, 2015). Lastly, it is worth highlighting one of the possible ways of solving this problem suggested by Mergendoller and Thomas (2001): “A great deal of thought needs to be given to how to support students through coaching and mentoring. Students need to have milestones and benchmarks, perhaps even templates” (p. 18). It might be appropriate to have these templates also for teachers, so that they would follow them and know when and how much support to provide to students.

**Group work problems.** Even though teachers reported many benefits for students of working in groups, they also mentioned various challenges regarding the collaboration. Similarly, scholars report that collaboration during PBL implementation is a huge challenge (Baysura et al., 2016; Harris, 2014; Van den Bergh et al., 2006). Moreover,

Kapp (2009) highlights that group work is the most difficult aspect of PBL after the lack of time (as cited in Tamim & Grant, 2003; Nicola & Allison, 2014).

Two of four teachers reported that there is a problem of unequal contribution of some students to the project work of the group. These results are in agreement with those of earlier studies. In this regard, Van den Bergh et al. (2006) states that it is hard to determine every student's contribution within each group. It is highly possible that because of some "free-riders" other students in the groups have to work more. Baysura et al. (2016) and Harris (2014) also found that there was an unequal contribution to the project work from some passive students. It is worthwhile to mention that group work is challenging to students because they lack necessary skills and experience in communication and collaboration within the groups (Yam & Rossini, 2010). However, group work issues might also indicate that teachers have problems regarding the facilitation of the learning. This problem could be solved by teaching teachers how to guide students and organize group work. This could be an example of the interconnection between the group work problems and the lack of appropriate knowledge on PBL.

Shachar and Fisher (2004) found that it is problematic for students to work in groups, as their motivation to learn was decreased when group methods were used during PBL (as cited in Baumgartner & Zabin, 2008). The same could be said for Kazakhstani students, as they may not be used to having group instruction methods very often. The problem with group work approach possibly could be considered as one of the USSR legacies, where students were afraid to have any autonomy and express their ideas easily during teacher-centered lessons (de la Sablonnière et al., 2009).

**Other challenges.** All four teachers mentioned that there was a problem related to lack of appropriate resources and materials. Moreover, the Chemistry teacher highlighted the financial aspect of this problem, saying that some projects might need special tools and

materials that could be expensive. According to him, students cannot afford them, which probably suggest that school should buy them. The difficulty concerning lack of available resources and materials was also mentioned by many scholars, who found that teachers perceive the lack of appropriate materials, resources, technologies and funds as the major obstacles in implementing PBL (Baysura et al., 2016; Harrigan, 2014; Harris, 2014; Nicola & Allison, 2014).

### **Summary**

In this chapter major findings of this research study were discussed and interpreted. These findings were compared with the existing literature and many different similarities and some important differences were found. Findings show that teachers perceive PBL in many various ways. Mostly they perceive it in a positive way, reporting many benefits of using PBL. It was found that teachers perceived PBL through the aspects, such as self-learning, increased engagement, and deeper understanding of the subject content. Among many other benefits, teachers highlighted maintaining discipline in the classroom and controlling students as one of the most important advantages. This could suggest that Kazakhstani teachers may face some problems with keeping discipline during lessons, and therefore, care a lot about the classroom management. Furthermore, the results of this study similarly with the findings of other scholars state that PBL improves the relationship between teacher and students, as well as among students within the groups. Teachers also mentioned that PBL develops several skills and abilities in students, such as collaboration, creativity and presentation skills, however, in comparison to the literature participants of this study did not report on all the variety of these skills, as they possibly were not aware of them. Moreover, the crucial finding was that PBL provides students with the appropriate environment that reveals and improves “hidden” skills and abilities, which suggests that without conducting PBL they would remain unnoticed. However, these skills do not have

to be the unique outcomes of PBL implementation and possibly could be developed by other teaching approaches.

It was also found that practice plays a significant role in PBL implementation. Moreover, the results show that the practical part of PBL provides students with opportunities to deeply investigate the topic and go beyond the curriculum of the school. The last point to mention is that students involved in PBL have a chance to deal with real existing problems, find their own answers to the problems and be helpful in solving them in real life. As a result, the gained experience and skills would probably be useful for them at university and in their future career.

As well as benefits, participants of this study also report different challenges they faced during PBL implementation. The major identified challenges are lack of time, lack of knowledge, and group work problems. Most challenges are common for both teachers and students. The findings of this study similarly with the results of other scholars present that lack of time is considered one of the biggest problems that teachers and students face while implementing PBL. The identified reason is that both teachers and students have to spend their own time after lessons to deal with PBL, which make them tired and stressed. Moreover, a few scholars reported that due to increased workload, some teachers refused to conduct PBL; however, this situation did not have a place in my study. This probably demonstrates that Kazakhstani teachers are more stress-resistant in terms of time issues and possibly can work even in conditions of the limited time.

Most teachers reported a lack of knowledge necessary to facilitate students during PBL implementation, which probably indicates that teachers are still used to teacher-centered teaching methods. This finding was similarly reflected in the studies of many other scholars. In this case, this problem could be explained as one of the Soviet time

legacies, where teacher-oriented teaching was widely used. Thus, teachers may struggle while using PBL, as it is based on student-centered manner.

The last-mentioned difficulty was related to group work, which was reflected in many studies regarding PBL. This problem was about the unequal contribution to the common work from some free-riding students, which affected the whole group. One of the possible explanations of this drawback might be the possible rare use of group work methods in Kazakhstani schools, which also comes from the USSR time, where the teacher-centered teaching style was of importance with students being just passive learners. This all possibly illustrates that Kazakhstani education in many aspects still reflects teaching and learning methods of the Soviet time. It may also indicate that change requires time and ongoing effort.

## Chapter 6. Conclusions and Recommendations

In this chapter, the results of this study are summarized and recommendations are provided for stakeholders. The purpose of this research study was to explore teacher perceptions about project-based learning, its benefits and challenges in a Kazakh- Turkish Lyceum in the northern part of Kazakhstan.

This chapter is divided into four sections. The first section presents a summary of the findings and discussion chapters that are structured by the research questions. The second section includes several recommendations for professional practice. The third section provides limitations of my study and implications for further research. Lastly, the fourth section is about self-reflection, where I offer my thoughts on the experience of conducting this research and writing this dissertation.

### **The summary of findings and discussion chapters**

**Research Question 1: How do teachers understand PBL?** There is a need to understand that no two teachers perceive PBL in the same way, as every teacher is unique and has different background and experience. The findings of this study suggest that there are wide-ranging perceptions of PBL, however, some of them were identified as the most common and frequently mentioned ones. Teachers perceived PBL in three major aspects. The first one is self-learning, which means that PBL is a more student-centered approach than a teacher-oriented method. Findings also suggest that teachers are only facilitators who direct students. At the same time, learners are left with much freedom and autonomy to go beyond the school curriculum and create their own knowledge. The second aspect is increased engagement, which means that PBL raises students' interest in learning because during PBL students are provided with opportunities to deeply investigate topics that are meaningful and interesting to them. Lastly, teachers perceive PBL through better

understanding of the subject. In this regard, PBL provides students with opportunities of collaboration, practicing theoretical knowledge and engaging in real existing problems, which contribute to their better understanding of the subject content.

**Research Question 2: What are the benefits of using PBL?**

*Positive atmosphere in the classroom.* The first three identified benefits are facilitation of learning, improved relationship between teacher and students, and better relations among students within the groups. These three benefits are interconnected, as they all have a positive impact on the overall atmosphere of the classroom; therefore, there is a need to summarize them together. The data suggests that PBL creates a pleasant and collaborative environment in the classroom because it is based on the group work approach, which contributes to the improvement of students' relationships within the groups. Moreover, it makes it possible for teachers to easily guide the whole class and have close contact with every group. Teachers also could use an individual approach, working with every student face-to-face, especially with those who need help the most. The findings indicate that working one-on-one helps teachers to get to know their students better and learn a lot about them, their weaknesses, strengths, needs and problems. That means that PBL could be a great tool to help students not only in school, but to know them better and support them even outside the school environment.

*Real-world practice and skill development.* The findings show that PBL is not just another teaching technique but it is more an educational transition from school to the real-world, which makes students' school life more meaningful and engaging. It does not give ready answers but motivates learners to search and find their own answers to the questions through tackling real and existing problems. Moreover, during PBL students go beyond the curriculum and may create their own knowledge.



**Research Question 3: What are the challenges of using PBL?**

*Lack of time.* The results of this work indicate that many challenges faced by participants in my study are similar to the difficulties identified in the literature. Lack of time is considered a significant obstacle, as teachers have to spend their own time after lessons to deal with PBL, which is usually the time to devote to other important areas of their lives. Moreover, teachers with an increased workload may become tired, which might negatively affect their health and mood.

*Lack of knowledge.* It was found that a lack of appropriate knowledge and experience for teachers could be one of the most important issues during PBL implementation, as it may lead to many other obstacles in scaffolding, time-management for projects and group work problems. Overall, it may negatively affect students' successful project completion. Therefore, it might be suggested to pay increased attention on providing teachers with appropriate knowledge and skills, and teach them according to their weak sides, as every teacher is unique and may have different problems in various aspects of PBL implementation process.

*Group work.* Teachers reported that group work is a major drawback in PBL implementation because of the unequal contribution from free-riding students. This problem might be connected with the lack of knowledge and experience on how to organize students for teamwork. Moreover, the findings suggest that teachers are still used to teacher-centered instruction methods, where teachers act as lecturers in front of the whole class. Therefore, the shift from teacher-oriented teaching approach to learner-centered learning methods should be gradual and natural.

Overall, PBL is perceived as an effective tool to increase student engagement in learning and foster greater understanding of the subject. Teachers believe that PBL is

focused on learners, provides them opportunities to go beyond the school curriculum and create their own knowledge. Moreover, teachers claim that PBL improves students' practice by involving them in real meaningful activities and connecting them to the real world. Based on reported benefits of this study, it seems that PBL could replace traditional academic strategies of memorization and passive learning by active student-centered learning. However, in order to take full advantage of this approach several challenges found in this study should be considered.

### **Recommendations for professional practice**

Considering the benefits of interdisciplinary knowledge and skills mentioned in the literature, school administration of this school should pay great attention to conducting meetings among teachers of different subjects, so that every teacher can share his or her ideas and experiences on PBL implementation in a certain subject. As a result, teachers may improve their interdisciplinary knowledge and help students deal with problems that require them to conduct PBL from the perspective of multiple subjects.

Teachers of this study were concerned about the lack of necessary materials and resources for PBL implementation. The school administration and Heads of KTL schools could think about different ways to resolve this problem. Solving this problem would probably contribute to a better implementation of PBL in the future, as students would have opportunities to conduct PBL in any area in which they were interested.

Moreover, the lack of knowledge was considered a major problem for teachers. It was found that teachers lack knowledge and experience in various areas of PBL implementation, such as scaffolding, organizing group work, and dealing with real-world activities. Regarding this, the Heads of Kazakh-Turkish Lyceums could think about conducting Republic PBL courses and training for KTL teachers. In these courses, teachers

could deal with upcoming problems, get feedback on their work and share their best practices and experiences with teachers from other KTL schools. Moreover, regular online meetings could be organized as necessary. There would not be a need to wait until the courses started. Online meetings would keep teachers up-to-date with the latest information on PBL and foster their self-improvement in PBL implementation.

Considering all the benefits found in this study and the influence of PBL on students' success in project competitions, policymakers could think about incorporating PBL into every subject as a mandatory part of the final grade in KTL schools. One part of the lesson could remain theoretical in a teacher-centered manner; however, the second part could be more practical in a student-centered style. As a result, this could help teachers and students shift from the teacher-oriented approach to student-centered learning more gradually. Students could choose topics within the curriculum and after in-depth investigation present it in front of the whole class. Moreover, as all presenting groups would have different topics, many aspects of the subject content could be covered in detail and in a short time. This could also be beneficial for teachers, as they would not have to explain all topics by themselves rather they would facilitate the learning instead.

Furthermore, PBL being implemented as a mandatory part of the subject would probably require teachers and students to spend less of their own time after lessons, as it would be partially done during the lesson. This could possibly contribute to the solution of the identified challenge concerning lack of time. Finally, if the results of this kind of pilot program are successful, showing an increase in academic achievement in students, KTL schools could share their best practices and experiences with other schools.

These are only possible suggestions for school administration, Heads of KTL schools and policymakers in education. The results of this study are not intended to

generalize to the population of teachers even in other KTL schools. This probably indicates a need for further research on PBL in order to better understand all peculiarities of this approach in the context of Kazakhstan.

### **Limitations of my study and implications for further research**

The limitations of this research study structure the implications for further research. One of the most important limitations is the small sample of only four teachers who teach Chemistry, Physics, Computer Science and English language. It could be recommended for further studies on PBL to include more teachers teaching many other subjects to see how it works in other subject conditions. Furthermore, there is a need to also explore Kazakhstani students' perceptions regarding PBL and its benefits and challenges. Only after taking into account both teachers' and students' perceptions, would researchers be able to have a full picture of how PBL is implemented in the context of Kazakhstan. Moreover, this study was conducted only in one Kazakh-Turkish Lyceum; therefore, the results of this study cannot be generalized to the teacher population in Kazakhstan. Future research studies could be conducted in many other KTL schools to see how PBL is implemented in other contexts.

Lastly, my study was based on a qualitative research design, which cannot generalize results to larger populations. There is a need to conduct also a quantitative research to gather numerical data and measure the relation of variables on each other and on academic achievement. Moreover, it could provide researchers with opportunities to compare PBL and non-PBL groups to see the effect of PBL on academic achievement.

### **Self-reflection as a researcher**

This is my first real experience in conducting an empirical study. Honestly, I did not take conducting a qualitative study seriously in the beginning, as I thought that studies

mostly matter when they are quantitative and are about numbers and statistical patterns. However, after conducting a qualitative research I realize that it could provide the researcher with so much unexpected and meaningful data derived from participants that would otherwise remain unnoticed. This study was very important for me because observing teachers' perceptions and experiences helped me to change my own practice in implementing PBL. Their perceptions about the benefits of using PBL motivated me to continue working with this new approach. At the same time, their experiences of challenges showed me the possible directions for improvement in PBL implementation. Furthermore, this research is beneficial because it presents the implementation of PBL in the unique context of Kazakhstan.

As well as this, writing this dissertation helped me to develop my research skills. I learned to find the necessary literature from various sources, to collect data from participants, to critically analyze it and present it to the audience. Moreover, conducting this study helped me understand that even teachers can make a significant positive impact not only on their students but on colleagues, their own schools, and the whole country by conducting research in an area that needs improvement. It is not policymakers, it is teachers who work with their students and know best what happens in schools, therefore, there is a strong need for every teacher to be able to conduct research and share their best experiences with others. As a result, this will all contribute to the quality improvement of the whole educational system of Kazakhstan and even other countries.

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## Appendices

### Appendix A

#### Interview questions

1. How are you?
  - Can you tell me a little about yourself?
  - What is your experience working in KTL?
  - How long have you been working in KTL?
  - What subject do you teach?
  
2. How do you understand project based learning?
  - How many years do you practice PBL?
  - Where did you get the appropriate knowledge on PBL?
  - What do you think about PBL as a learning strategy?
  
3. How do you think what are the benefits of using PBL?
  - Could you tell me the most important benefits for students?
  - What do you think about students' attitude towards PBL?
  - In your opinion, what are the benefits of using PBL for you?
  
4. What are the challenges of using PBL?
  - Could you tell me the major difficulties in using PBL?
  - If you need help on PBL whom do you usually address?
  - What factors could help you to overcome these problems?

## Appendix B

### Informed consent form

#### Teacher perceptions about project-based learning in Kazakhstan

Date \_\_\_\_\_

Dear \_\_\_\_\_

**DESCRIPTION:** You are invited to participate in a research study that explores teacher perceptions about project-based learning (PBL), its benefits and challenges in Kazakh-Turkish Lyceum in Kostanai city. You will be asked to participate in one one-on-one interview. During the interview you will be audio recorded with your permission.

To ensure your confidentiality pseudonyms will be used in all field notes, transcriptions and the whole thesis. The name of the school will also be coded so as not to reveal your principal. All your personal information will be kept private. All hard copy documents with your personal information, including informed consent forms and field notes will be kept in a safe place. All the electronic data, including audio recordings and transcriptions, will be kept on a personal computer with a security password. Only the researcher and his research supervisor will have access to all the collected data. All the research documents will be destroyed within two years after the completion of NUGSE Masters Programme.

**TIME INVOLVEMENT:** Your participation will take approximately an hour.

**RISKS AND BENEFITS:** The risks associated with this study are minimal. The feedback provided by you regarding the PBL, its benefits and challenges will not be used to make judgments about the school. Your name and other personal information will be coded in all documents. No information regarding your participation will be disclosed to the teachers or the administration of the school. The benefit which may reasonably be expected to result from this study is that you will have the opportunity to reflect on your own practice in using PBL. As you will deeper understand the possible challenges and benefits of using this approach you could better instruct your students in working on projects and help them gain all the necessary skills for developing a project and working collaboratively in a project team. The school administration will think of the effective methods and ways of overcoming the identified challenges in using PBL. Your decision whether or not to participate in this study will not affect your employment.

**PARTICIPANT'S RIGHTS:** If you have read this form and have decided to participate in this project, please understand your participation is voluntary and you have the right to withdraw your consent or discontinue participation at any time without penalty or loss of benefits to which you are otherwise entitled. The alternative is not to participate. You have the right to refuse to answer particular questions. The results of this research study may be presented at scientific or professional meetings or published in scientific journals.

**CONTACT INFORMATION:**

**Questions:** If you have any questions, concerns or complaints about this research, its procedures, risks and benefits, contact the Master's Thesis Supervisor for this student work, Dilrabo Jonbekova, [dilrabo.jonbekova@nu.edu.kz](mailto:dilrabo.jonbekova@nu.edu.kz).

**Independent Contact:** If you are not satisfied with how this study is being conducted, or if you have any concerns, complaints, or general questions about the research or your rights as a participant, please contact the NUGSE Research Committee to speak to someone independent of the research team at +7 7172 709359. You can also write an email to the NUGSE Research Committee at [gse\\_researchcommittee@nu.edu.kz](mailto:gse_researchcommittee@nu.edu.kz)

Please sign this consent form if you agree to participate in this study.

- I have carefully read the information provided;
- I have been given full information regarding the purpose and procedures of the study;
- I understand how the data collected will be used, and that any confidential information will be seen only by the researchers and will not be revealed to anyone else;
- I understand that I am free to withdraw from the study at any time without giving a reason;
- With full knowledge of all foregoing, I agree, of my own free will, to participate in this study.

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

## Appendix C

### Coding

#### Interview Sample

Transcript	Codes
I: What subject do you teach?	CODE 1: Subject
E: I am a teacher of English language	
I: How long have you been teaching in KTL?	
E: I have been teaching for 7 years	CODE 2: Years of teaching
I: Can you tell me about experience working in this school?	
E: In 2014 I became vice principal, which I do not like. Because being a teacher is another thing. It is a great thing which I cannot describe. You are always close to students.	CODE 3: Teaching experience
I: Can you tell me how you understand project-based learning?	
E: It is about learning one topic and it is based on students' interests. To make them get involved in the process of learning and make them learn by themselves. You just direct them and students learn by their own.	CODE 4: "students' interests" CODE 5: Self-learning CODE 6: "just direct them"
I: Thanks. How many years have you been practicing PBL?	CODE 7: Practicing PBL
E: Usually I do it when students want extra marks. I would say that they are not smart in English grammar, maybe they are good at other parts, like arts, singing, dancing. For these students it is very interesting. They learn with their own talent. I have been practicing since 2014.	CODE 8: Extra marks CODE 9: Self-learning
I: Can you tell where do you get the appropriate	



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knowledge, readings and materials related to PBL?

E: Unluckily I have not attended any seminars or courses according to PBL. I have just heard from teachers who attended those seminars. And from internet some materials, and from teachers who are practicing it very often.

CODE 10: No seminars attended

CODE 11: Internet and teachers

I: Could you tell the most important benefits for students in using PBL?

CODE 12: Benefits for students

E: The most important is making them study by themselves. It is students' task to do everything. In this case it would be easier for teacher to control them and direct. You can also find out other talents of students, like drawing, singing, dancing, making video. Shy students can show their abilities. Of course it is also very useful when you show to their parents what they have done, they would get really satisfied.

CODE 13: Self-learning

CODE 14: Easier control

CODE 15: Students' talents

CODE 16: Shy students

CODE 17: Parent satisfaction

I: What do you think about students' attitude towards PBL?

E: Some students fail exams and in order to get good marks they can take PBL and prove to teacher that they are the right students to get excellent marks.

CODE 18: Another way to get marks

There also might be students that want to show their skills in one particular area. But mainly PBL is good for weak students. They can learn interesting things. PBL will be useful in order to get their attention, to raise their interests in particular subject. And they will be doing it willingly.

CODE 19: PBL for weak students

CODE 20: Interests in subjects

CODE 21: Self-learning

I: What are the benefits for you in using PBL?

E: I think that PBL can be used not only in subjects, it can be some type of social area for interesting things you want to know, like surveys, public

CODE 22: Benefits for teachers

CODE 23: Interesting things

opinion. For example, how to improve your school if you have 50000 tenge. In this case students will think not in the way you teach them, but they will get out of the box, they can have many great ideas. For teacher it is good to get help from students. The last project that 11 graders made was about asking people why they say thanks. And it was interesting to find out that one man said that he never says thanks. PBL can help us to think how we can make this world better.

CODE 24: "get help from students"

CODE 25: "make this world better"

As well as this, you get closer to your students, create warm relationships with them and there is more trust between you and them. And when you give any tasks they do it with pleasure!

CODE 26: "better relations with students"

I: Thanks a lot!

I: What are the major challenges of using PBL for students?

E: Sometimes students do not know how to put questions, some struggle in analyzing surveys. They can easily make a video, but bad at analyzing the results. Sometimes it takes a lot of time, materials and energy. Once one student went to village to measure the height of the hill.

CODE 27: PBL challenges for students

CODE 28: Bad at analysis

I: What are the challenges of using PBL for you?

E: I did not know how to start, what should be our aim? Sometimes we were looking for very difficult topics. Also when teacher does not understand himself, it is hard to explain it to students and they do not understand what teacher wants from them. Lastly, PBL requires extra time after lessons, which makes me tired.

CODE 29: Lack of materials and time

CODE 30: Lack of knowledge

I: If you have problems with PBL, whom do you

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usually address?

E: There are a lot of experienced teachers who always share ideas and happy to help. For example, there is the Head of English department in Astana.

CODE 31: Tiredness

I: What factors could help you to overcome problems concerning PBL?

CODE 32: Experienced teachers

E: Talking to students is helpful because we find solutions together, not making them find it.

CODE 33: Head of English

I: Thank you very much for participation. Your input will be valuable for this research and in helping grow all our professional practice. I hope it will help your students become better.

department

CODE 34: Solutions

A: Thank you, goodbye!

## Appendix D

### Cross-participants comparative tables

Table 1

*Teachers perceive PBL through the following three aspects*

Participants	Subject	self-learning	increased engagement	deeper subject understanding
Participant 1	Computer Science	X	X	
Participant 2	English language	X	X	
Participant 3	Chemistry	X	X	X
Participant 4	Physics	X	X	X

Table 2

*Teachers report about the following benefits of using PBL*

Participants	Subject	Improve discipline	better teacher-student relation	better student-student relation	skill improvement	real-world practice
Participant 1	Computer Science	X	X	X	X	X
Participant 2	English language	X	X		X	X
Participant 3	Chemistry			X	X	
Participant 4	Physics	X	X	X	X	

Table 3

*Teachers report about the following challenges during the PBL implementation*

Participants	Subject	lack of time	lack of resources	lack of knowledge	free-riding
Participant 1	Computer Science	X	X	X	
Participant 2	English language	X	X	X	
Participant 3	Chemistry	X	X	X	X
Participant 4	Physics	X	X		X

## Appendix E

### The Differences between Projects and Project-Based Learning

(<http://www.teachingtimes.com/articles/differences-between-projects-and-pbl.htm>)

Projects...	Project-based learning...
Can be done at home without teacher guidance or team collaboration.	Requires teacher guidance and team collaboration.
Can be outlined in detail on one piece of paper by the teacher.	Includes many 'Need to Knows'* on the part of the students and teachers.
Are used year after year and usually focus on product (make a mobile, a poster, a diorama, etc.).	Is timely, complex, covers many TEKS**, and takes a team of highly trained professionals significant time to plan and implement.
The teacher work occurs mainly after the project is complete.	The teacher work occurs mainly before the project starts.
The students do not have many opportunities to make choices at any point in the project.	The students make most of the choices during the project within the pre-approved guidelines. The teacher is often surprised and even delighted with the students' choices.
Are based upon directions and are done 'like last year'.	Is based upon driving questions that encompass every aspect of the learning that will occur and establishes the need to know.
Are often graded based on teacher perceptions that may or may not be explicitly shared with students, like neatness.	Is graded based on a clearly defined rubric made or modified specifically for the project.
Are closed: every project has the same goal.	Is open: students make choices that determine the outcome and path of the research.
Cannot be used in the real world to solve real problems.	Could provide solutions in the real world to real problems even though they may not be implemented.
Are not particularly relevant to students' lives.	Is relevant to students' lives or future lives.
Do not resemble work done in the real world.	Is just like or closely resembles work done in the real world.
Do not include scenarios and background information or are based on events that have already been resolved.	The scenario or simulation is real or if it is fictitious, is realistic, entertaining, and timely.
Are sometimes based around a tool for the sake of the tool rather than of an authentic question. (Make a Prezi.)	Use technology, tools, and practices of the real world work environment purposefully. Students choose tools according to purposes.
Happen after the 'real' learning has already occurred and are just the 'dessert'.	Is how students do the real learning.

Are turned in.	Is presented to a public audience encompassing people from outside the classroom.
Are all the same.	Is different.
Example: Make a model (or diorama or mobile . . . ) of the school/town/local site of interest.	Example: Design a fortification that would take your community through a bio or other non- traditional attack and make a recommendation to the city council for future planning.