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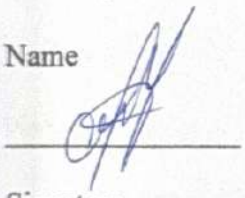

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«SDU University»

Faculty of Education and Humanities
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The Impact of Project-Based Learning in Fostering Critical Thinking Skills of the 1st year TFL Students

Laura Lyadova

A thesis submitted to the Faculty of Education and Humanities

in partial fulfillment of the requirements for the degree of

MASTER OF ARTS

in Teaching English as a Foreign Language

SDU University

Department of Language Teacher Education

June, 2025

Thesis Advisor:

Associate Professor, PhD, Kymbat Smakova

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Laura Lyadova

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ACKNOWLEDGMENT

First of all, I want to thank my family members, especially my mom, for all the support and belief in my strength they provided me with throughout this tough thesis writing process. Also, I want to say a big thank you to my best friend – Xeniya - whose support and love was endless. Thank you for replacing me in all household chores and cooking for me, when I was extremely busy and stressed writing my thesis and working so hard. I am very thankful to my boyfriend – my partner in crime in all life inconveniences - for all the eternal emotional support and love that I was surrounded and gifted by.

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Finally, Thank You very much to my students, without their commitment and efforts – my work has no value! They cannot imagine how much I am thankful for having them in my life!

It is a small step for them, but it is a giant leap for me! Thank you!

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The Impact of Project-Based Learning in Fostering Critical Thinking Skills of the 1st year TFL Students

Abstract

The following research study aims to investigate the impact of Project-Based Learning on improving the critical thinking capabilities of the first-year students majoring in the "Two Foreign Languages" (TFL) specialty at one private university in Kazakhstan. The study implements a mixed research method incorporating the elements of quantitative and qualitative research instruments and data analysis. The quantitative part of the research is demonstrated by the quasi- experimental study conducted among 66 students who voluntarily agreed to be proceeding participants. 40 students have received PBL intervention, while the rest, 26 students, have been selected as a control group and followed the traditional project method. After gaining official permission from the Research Ethics Committee and spreading consent letters, voluntary students have been provided with the Watson- Glaser Critical Thinking Test to write before and after the intervention of PBL into mainstream education to address the main objective of the study. The qualitative part of the study is represented by the pre-perception and post-perception interviews complemented with reflective essays of students written at the end of PBL intervention. "The Gold Standard PBL" projects have been implemented among the first- year students within 15 weeks of the semester. The quantitative results of the study, which contain pre-test scores, post-test scores, and gain scores (post-test – pre-test) of control and experimental groups, have undergone descriptive statistical analysis, followed by normality distribution tests and inferential statistical analysis of overall critical thinking gains (Student's t-test) and individual critical thinking dimensions (Paired t-test). While qualitative data have been analyzed using a 6-step thematic analysis of Braun and Clarke (2006). The pre-test scores have shown that all students started at the same level of critical thinking. Despite the fact that mean results have demonstrated a slight increase in treatment groups in post-test and gain score results, according to inferential statistics outcomes, this small increase is practically insignificant ($p>0.05$). Additionally, the treatment group has mainly developed their interpretation (+0.43) and argumentation (+0.25) subskills. Moreover, the results of qualitative data have shown a highly positive perception of PBL by students who noted that PBL improved their critical thinking skills through research analysis and iterative problem-solving.

Keywords: Impact, PBL, critical thinking, first-year students, Two Foreign Languages.

«Екі Шет Тілі» мамандығының 1 курс студенттерінің Сыни Тұрғыдан Ойлау Дағдыларын Дамытудағы Жобалық Оқытудың Әсері

Аңдатпа

Бұл зерттеу «Екі шет тілі» мамандығының 1-курс студенттерінің сыни тұрғыдан ойлау дағдыларын дамытуда Жобалық Оқытудың (ЖО) әсерін зерттеуге бағытталған. Зерттеу аралас әдіснамалық тәсілге негізделіп, сандық және сапалық деректерді жинау мен талдау құралдарын қамтыды. Сандық бөлімде 66 студенттің қатысуымен квази-эксперимент жүргізілді: олардың 40-ы жобалық оқытуды қабылдаған тәжірибелік топқа, ал 26-сы дәстүрлі әдіспен оқытылған бақылау тобына кірді. Этика комитетінен ресми рұқсат алып, қатысушылардың келісімінен кейін, Ватсон-Глейзер сыни ойлау тесті ЖО енгізілгенге дейін және кейін өткізілді. Сапалық бөлімге ЖО-ға қатысты студенттердің бастапқы және қорытынды пікірлерін қамтыған сұхбаттар мен семестр соңында жазылған рефлексивті эсселер енді. Жобалар "Жобалық Оқытудың Алтын Стандарттарына" сүйене отырып, 15 апта бойы жүргізілді. Зерттеудің сандық нәтижелері – яғни бақылау және эксперименттік топтардың алдын-ала тест, кейінгі тест және өсім ұпайлары (кейінгі тест – алдын-ала тест) – алдымен сипаттамалық статистикалық талдаудан өтті. Бұдан кейін деректердің қалыптылыққа сәйкестігі тексеріліп, жалпы сыни ойлау өсімін бағалау үшін шығымдық (инфериалдық) статистикалық талдау жүргізілді (Student's t-test), сондай-ақ сыни ойлаудың жекелеген өлшемдерін бағалау үшін жұптық тест қолданылды (Paired t-test). Сапалық деректер Браун мен Кларктың (2006) алты кезеңді тақырыптық талдау әдісімен өңделді. Алдын ала тест нәтижелері барлық студенттердің бастапқыда бірдей деңгейде болғанын көрсетті. Емдік топтың орташа ұпайлары артқаны байқалса да, бұл өсім статистикалық жағынан маңызды емес ($p>0.05$). Сонымен қатар, емдік топ негізінен интерпретациялау (+0.43) және аргументациялау (+0.25) дағдыларын дамытқан. Сапалық деректер ЖО-ға қатысты студенттердің оң көзқарасын анықтады – олар бұл әдіс зерттеу, талдау және мәселені шешу арқылы сыни ойлау қабілеттерін жақсартқанын атап өткен.

Түйінді сөздер: Әсері, жобалық оқыту (ЖО), сыни ойлау, бірінші курс студенттері, Екі Шет Тілі.

Влияние Проектного Обучения в Развитии Навыков Критического Мышления у студентов первого курса специальности "Два Иностранных Языка"

Аннотация

Данное исследование направлено на изучение влияния Проектного Обучения (ПБО) на развитие навыков критического мышления у студентов первого курса специальности «Два Иностранных Языка» одного из частных вузов Казахстана. Исследование выполнено в смешанном методологическом подходе, включающем как количественные, так и качественные инструменты и методы анализа данных. Количественная часть представлена квази-экспериментальным методом, в котором приняли участие 66 студентов на добровольной основе: 40 студентов составили экспериментальную группу с внедрением проектного обучения, 26 — контрольную группу, обучавшуюся по традиционному методу. После получения разрешения от этического комитета и согласия участников был проведен тест критического мышления Ватсона-Глейзера до и после внедрения ПБО. Качественная часть включала предварительные и итоговые интервью о восприятии ПБО, а также письменные рефлексии студентов. Проекты, основанные на “Золотом Стандарте Проектного Обучения”, проводились в течение 15 недель. Количественные данные, включающие баллы до и после теста, а также прирост (разница между пост-тестом и пре-тестом) для контрольной и экспериментальной групп, были проанализированы с использованием описательной статистики, проверки на нормальность распределения, а также выводного статистического анализа для общего прироста навыков критического мышления (Students t-test) и для анализа отдельных компонентов критического мышления (Paired t-test). Качественные данные были обработаны с использованием шестиэтапного тематического анализа Брауна и Кларк (2006). Результаты предтеста показали, что все участники начинали с одинакового уровня критического мышления. Несмотря на небольшое повышение средних баллов в экспериментальной группе в посттесте и приросте, выводный статистический анализ показал, что это улучшение статистически незначимо ($p > 0,05$). При этом наибольшее развитие наблюдалось в поднавыках интерпретации (+0,43) и аргументации (+0,25). Качественные данные выявили позитивное восприятие ПБО со стороны студентов.

Ключевые слова: Влияние, Проектное Обучение (ПБО), критическое мышление, студенты первого курса, Два Иностранных Языка.

Key Terms

Impact - refers to the measurable changes in students' critical thinking abilities as a result of engaging in Project-Based Learning activities.

Project-Based Learning (PBL) is a student-centered instructional approach in which learners actively explore real-world problems and challenges through the creation of meaningful projects.

Critical Thinking Skills - refer to the ability to analyze, evaluate, interpret, and infer information in a reflective and logical manner to guide beliefs and actions.

TFL students – students who are majoring in two foreign languages, namely English and any other foreign languages.

EFL students – English as a foreign language, students who are acquiring English as a foreign language living in a non-English speaking environment.

CHAPTER 1

Introduction

1.1 Background Information

These days, technologies are advancing in an extremely quick way by occupying almost all spheres of life, including education. Constant changes in the world and high competition in the labour market require the young generation to exhibit essential higher-order abilities to solve various problems. Therefore, one of the essential elements of the future economic growth and national competitiveness in the revolutionary era of advanced technologies is forming an innovative learning system which is aimed at improving the competency of students who obtain 21st–century skills. In other words, young people should learn the skills which are necessary to enter the world of work, and one of them is critical thinking skills. As stated by Fisher (2001), critical thinking assists in the working and learning processes by determining the possible relationships between things and leading to correct decisions. As a result, critical thinking is an important intellectual process that presupposes active involvement and is fully capable of conceptualizing, applying, and evaluating data that is collected through observations, experimentation, and reflections, helping people not only to believe in something but also to act appropriately.

1.2 Problem Statement

Nonetheless, according to the test results, which were held by the Organization for Economic Co-operation and Development (OECD) within the Programme for International Student Assessment (PISA) in 2022, Kazakhstani students depicted below-average results by ranking 51st out of 81 states involved in the program. To be precise, in terms of mathematics, Kazakhstan is ranked 47th place, while occupying 61st place in reading, and 49th in science

(Omirgazy, 2023). The provided ratings show slight changes in outcomes compared to previous years. Since the main aim of PISA is to explore the degree of problem-solving and critical thinking skills of students, it can be concluded that the Kazakhstani students are still struggling in applying their critical thinking abilities appropriately, yet they need more improvements in the 21st-century competencies. The main reasons for such deteriorations in the educational process might lie in the teacher-centered classes and the inherited curriculum model of the Soviet Union, which is mainly perceived as “centralized, rigid, inflexible and overloaded” (Steiner-Khamsi et al. 2006; Kalikova & Silova, 2008), and it is completely misaligned with the country's idea to modernize the current educational state. Moreover, based on the research findings from the survey of Adult Skills (conducted within the OECD annual report), less than 1% of the Kazakhstani young population demonstrates highly proficient abilities of problem solving and critical thinking skills compared to 25% on average across 38 OECD countries (OECD, 2019). The low results of PISA and the survey highlight the conflicting nature of public training, which leads to low imaginative and reasoning abilities of young students (Suharyat et al., 2022). The above-mentioned situation might be addressed by introducing and adhering to methods of student-centered learning by allowing students to deal with authentic situations, provide their views, be engaged in analysis, and maintain open-mindedness. Consequently, growth in retaining information efficiently and cultivating the cognitive talents of young people directly depends on critical thinking. Therefore, university administration and teachers should think about how they can introduce and develop students’ ability to think critically through existing educational courses. With the learner-centered approaches, such as Project-Based learning, it is still possible to implement and release this idea in the real world.

1.3 The Aim of the Study

The iterative nature of Project-Based learning (PBL) is oriented to encourage students to generate original ideas, apply problem-solving abilities related to social life, and hone their critical thinking skills (Nair & Suryan, 2020). It is also focused on the concept of developing 21st-century skills and assisting young people in navigating and managing modern challenges. Since the project-based learning emphasizes real-life research, students cannot inquire about scientific claims without being able to approach any information critically. It awakens students' abilities to think critically and impact their creativity as well. Any learning that aims to make the learning process a source of experience must include critical thinking skills in order to stay competitive in the future (Rochmahwati, 2015).

Therefore, the main aim of the study is to identify the influence of Project-Based Learning in improving students' critical thinking skills in higher education.

1.4 Research Questions

The main research questions:

1. What is the impact of project-based learning on students' critical thinking abilities?
2. What is the perception of PBL experience by the 1st year TFL students?

1.5 Significance of the study

Based on the main aim of the research, the study holds both theoretical and practical significance. Theoretically, the study contributes to the continuous discourse on effective pedagogical approaches by determining the relationship between PBL and critical thinking development. The study may provide remarkable insights into understanding how innovative teaching methods might foster essential skills required for success in the 21st-century workforce. Practically, the potential findings of the study have implications for education strategies and

policies, especially in the context of Kazakhstan, where student performance is a concern. Demonstrating the effectiveness of Project-Based Learning (PBL) in fostering critical thinking can provide valuable guidance for educators by creating more engaging and effective learning opportunities, which ultimately lead to improved academic outcomes for students.

It should be highlighted that the scope of this research is limited, and candidates for the projected quasi-experiment are the first-year students of the "Two Foreign Languages" specialty who are unlikely to experience the intervention of PBL activities in the learning process.

1.6 The Structure of Thesis

The thesis paper consists of six main chapters. In the initial chapter, introduction, the significance of critical thinking and PBL will be thoroughly analyzed by identifying existing gaps in the Kazakhstani context. In Chapter Two, the literature review will present the thorough analysis of previous studies to identify the degree of PBL effectiveness on students' critical thinking abilities. Moreover, it aids in investigating the perceptions of PBL by students. The following chapter will deal with methodology as regards instrumentation, participants, and the tools and methods of collecting the given data involving both experimental parts of the study and qualitative one. In Chapter Four the main findings of the study will be reported based on the applied methods to gather and analyze information. The outcomes will be presented in a coherent order, preparing readers for a deeper interpretation of the data in the subsequent discussion section (Chapter Five), typically positioned as one of the concluding sections of the paper. In this section, all collected data will be examined and described to explain the importance of findings and establish connections with the research questions initially posed in the study. The concluding chapter will summarize all information and provide recommendations for the study.

CHAPTER 2

Literature Review

2.1. Project-Based Learning

2.1.1 Theoretical Background

As the matter of the fact, PBL cannot be totally considered as a new phenomenon in the area of innovative teaching practices. The roots of Project-Based learning can be traced back to the concept of "learn by doing" which had been widely practiced by the ancient Chinese scholars. These ideas were later followed by Newton and other investigators of the 16th century who explored the most essential findings of the world. Nevertheless, Project -Based Learning (PBL) is a distinctive pedagogical approach which has been developed throughout the period of the 20th century, drawing significantly from constructivist, social and experiential learning theories, further enhanced by motivational and situated learning perspectives.

2.1.2 Constructivism and Social Constructivism

The foundational principles of PBL heavily rests on idea of constructivism, which posits that students learn by actively constructing their knowledge and understanding through gained experience and reflection (Piaget, 1972). Based on the area of interest, students build their knowledge by connecting newly acquired idea with an existing one and implementing it in the real-life settings (Smakova, 2020). They are not passive recipients of knowledge but active builders of the understanding as they manage with the difficulties of their projects through active problem-solving, continuous inquiry, and the creation of meaningful products (Thomas, 2000). Therefore, the iterative nature of project which includes research, design, reflection, and refinement completely aligns with the constructivist notion of learning as a long-term process of building and revision. Furthermore, it is a well-known fact that in a well-designed PBL

environment, collaborative work of students and guidance from instructors enable necessary scaffolding for learners to alleviate with challenges which they are unlikely to accomplish autonomously.

A critical aspect of sociocultural nature of PBL aligns with Vygotsky's ideas of perceiving learning as a socially mediated process. Moreover, the modern teaching practices emphasize the importance of collaboration in fostering both cognitive and academic development. Essential social aspects of PBL, such as collaborative work of group members in negotiating ideas, co-constructing solutions and engaging in rich discussions completely match with Vygotsky's and Cole's (1978) concept of learning through social interaction. These days the integration of technology in modern PBL practices enhances collaborative opportunities among students, allowing for various forms of communication and knowledge exchange (Anazifa & Djukri, 2017).

2.1.3 Experiential Learning and Progressive Education Movement

Originally, the birth of Project-based Learning is closely linked to the 20th century when American educational reformer known as John Dewey highlighted the impact of experience on students' learning in his early writings. This idea was also developed and supported by Kilpatrick (1918) who believed that students' engagement in meaningful activities promotes their effective acquisition (Smakova, 2020). Neither Dewey nor Kilpatrick used the modern term PBL for defining their progressive education principles, however, both of them underpin foundational ideas for modern practices of PBL. According to Dewey (1974), education was seen as a process of living rather than the preparation for future. He rigidly believed that the school should prepare students for a life as real and vital as it is possible, so children are able to experience exactly the same things they do at home or outside. His key ideas of learning involve

the following principles: 1) Learning by Doing – students learn by actively involving in real-life experience; 2) Education as Life – learning should connect to students' real needs, not just abstract knowledge; 3) Democratic Classroom – problems should be solved through collaboration and group inquiry.

These ideas were further developed by Kilpatrick (1918) who generally formalized "Project Method", he pointed out the idea that PBL is "wholehearted purposeful activity" driven by students and emerged from their intrinsic motivation to acquire new knowledge and skills. Compared to Dewey, he believed that PBL should have real-world relevance by connecting classroom learning with its practical applications.

2.1.4 Motivational Theories

Modern practices of PBL are not solely based on theories of early educational reformers, but also build upon ideas of contemporary theories of Self-Determination (Deci & Ryan, 2000) and Situated Learning (Lave & Wenger, 1991). Based on Deci & Ryan (2020), students' choice in a project selection, autonomous learning, enhancement of competency through challenging yet achievable tasks and sense of relatedness contribute to a positive and engaging learning environment in PBL. Whereas, essential principles of Situated Learning (1991) prepare students for a complex and rapidly changing world. The recent research has shown that the design of current project works is closely embedded in real-world practices which represent issues that students are likely to encounter in future workplaces and civic lives (Guo et al., 2020).

2.2 Contemporary PBL (The Gold Standard PBL)

The modern philosophy and grounded frameworks of PBL constitute with key ideas of above-mentioned educational reformers. The contemporary PBL is widely practiced both in secondary and high school education by representing more structured way of assessment and

highlighting the public presentation of the final artifacts. The most current explanation of PBL has been defined by Buck Institute (2018), a leading organization in PBL education, which states that Project-Based Learning is a teaching method which enables students to gain new knowledge and skills by working on the project guided by a driving question for an extended period of time. Although there are numerous ways of implementing PBL into life, the most modern and highly suggested one is the The Gold Standard PBL proposed by John Larmer, John Mergendoller, and Suize Boss of the Buck Institute for Education which has been promoted on their books "Setting Standard for Project-Based Learning" in 2015. According to provided framework, PBL consists of seven essential elements which result in successful project implementation both for teachers and students. The model promotes the integration of PBL which focuses on obtaining essential skills for students and proper comprehension of the material.

Seven essential project design elements include 1) a challenging problem or question which is the main guiding tool for any project to be conducted followed by 2) sustained inquiry stage, where students search and evaluate information for credibility rigorously applying it to the existing issue. The next step involves 3) authenticity which emphasize the personal interest and relevance of the project to the real-world application. On stage 4: students' choice and voice, students make their autonomous decision on the format of their work by operating independently. The step known as 5) reflection includes peer-reflection and teacher feedback on students' effectiveness and possible obstacles. The last two stages of the model 6) critique &revision and 7) public product concentrate on feedback application and presenting the final artifact to people beyond their classroom walls. The effectiveness and consistency of the model has been approved by numerous research studies.

2.3 Project-Based Learning and Traditional Project Method

Despite its innovative popularity in the teaching area, Project-Based Learning (PBL) is still being confused with the traditional project method practiced in educational institutions. The core differences of these two approaches to learning lie in student' role in the learning process and the nature of learning activities. While traditional project instructions tend to be teacher-driven emphasizing passive perception of information and mastery over the content and final product, PBL initially associates with long-term students driven process of inquiry addressing real life issues and highlighting students' interest over the process rather than the product (Buck Institute of Education, 2019). Additionally, PBL associates with the public presentation of the final product and progressive reflection cycles, while traditional projects are concerned with single correct outcome and fixed assessment held within classroom walls. Both of teaching methods are widely implemented and practiced worldwide, however, PBL possess the recommended nature by being considered as a key in developing 21st century skills of students (OECD, 2019).

2.4 The Impact of PBL

One of the most crucial results of integrating The Gold Standard PBL into education has been revealed by the American Institutes for Research among 3654 American high school students across 114 schools. According to the quasi-experimentative study, it has been investigated that academic performance of PBL students scored eight percentage points higher on exams compared to traditional learning groups of students. The study demonstrates high efficacy of PBL in college preparation courses. Similarly, research conducted by Abishova et al. (2020) among three universities located in Kazakhstan reports about improved critical thinking skills and motivational level of students after integration of the Gold Standard PBL in

educational process of students. Despite a number of challenges, such as lack of training, limited curriculum standards, and resistance to learning, the results highlight enhanced students' interest in learning. Likewise, to determine the effectiveness of PBL Nazarbayev Intellectual School integrated PBL in STEM subjects aligning with core elements of the Gold Standard. According to the final results, NIS students outperformed national average in Creative Thinking Assessments (NIS Reports, 2022). Additionally, study by Lesman et al. (2023) among 60 vocational high school students have identified effective impact of PBL on students critical thinking skills, 28% gains in problem-solving and analysis based on pre-test and post-test outcomes. Furthermore, students improved their creativity and reported about high interest in learning compared to traditional methods of teaching.

The following research study held by Li et al. (2015) revealed enhanced speaking fluency and significant improvements in intercultural communication skills among 400 university EFL students. While, study outcomes of González-Lloret (2022) determine remarkable changes in students' interest and motivation to learn indigenous languages. Due to the rapid advancements of technology, the integration of digital platforms to PBL has become very apparent. According to the project work organized by Godwin-Jones (2023), students had to co-create AI language learning applications with Chat GPT. Both study and project design have been finished successfully by developing students' higher lexical diversity in essay writing in comparison to traditional classrooms.

2. 5 Critical Thinking

The importance of acquiring skills which are relevant to the 21st century world cannot be doubted. Therefore, the current educational system should be focused on shaping skills and essential attitudes which would contribute to a sustainable future. Griffin and Care (2014)

classified competencies required in the 21st century as critical thinking, creative skills, communication and collaboration skills. It is important to note that critical thinking skills are one of the fundamental skills in solving real-life issues and addressing them by finding appropriate solutions. Therefore, modern instructors are likely to pay a remarkable role in designing and developing learning programs which are focused on strengthening these skills (Sari et al., 2019).

2.5.1 Theoretical Foundation and Definitions

The educational revolution of 1980s witnessed rapid alterations in traditional term of learning and teaching, the growing accord clearly illustrated that the main aim of education lies in the process of progressive inquiry and cognitive thinking rather than pure accumulation of disjoined skills and irrelevant information (Facione, 1990). The critical thinking movement has gained significant attention of schools and colleges which were vigorously integrating components of critical thinking into lesson plans and general education programs. Further the major success of critical thinking has been met when state departments of education targeted critical thinking in their curricular frameworks and standardized testing systems. Facione (1990) in his early writings mentioned that critical thinking instruction mainly focuses on ways students approach a question and reason its correctness. He noted that critical thinking assessment should not be merely targeted on the ideas of whether the answer is correct or not, but rather question what critical thinking skills have been applied by students in arriving to the correct conclusion. Therefore, Facione (1990) made a consensus statement by providing clear definition of critical thinking and discovering new dimensions. Facione (1990) defined critical thinking as an essential tool of inquiry which analyzes, evaluates, and synthesizes gained information. Through thorough research among 46 scholars, he was able to determine three validated components of critical thinking, including analysis, evaluation, and inferences. Glaser (1942) has identified

essential dimensions of critical thinking which consists of problem recognition, searching appropriate means of addressing this issue, recognizing assumptions, evaluating arguments, and drawing conclusions based on collected data.

The recent studies on critical thinking are still in the process of discovering essential dimensions of critical thinking. One of the books written by Elder and Paul (2020) represent eight essential elements of critical thinking, emphasizing the role of Socratic questioning in challenging assumptions. In their book, they relate critical thinking to "the art of thinking about thinking to improve thinking."

As noted by The National Council for Excellence in Critical Thinking (2021) that critical thinking is an intellectually disciplined process which involves the process of conceptualization and applying data resulting from observation, experience, reasoning, communication and interference. In other words, it assists people in forming appropriate and deliberate decisions though an examination of all important elements of reasoning: purpose, problem, or a questionable issue, assumptions and concepts. Whereas, Niu et al. (2013) defines critical thinking as a deep cognitive process which analyzes and tests information, additionally, assisting in the professional and personal life of people. Critical thinking is a type of thinking which requires people to be more reflective and observe the issue from different sides which result in more solid conclusions. It is one of the higher-order thinking skills which involves interpretation, constant analysis, evaluation, and proved explanations. With higher order thinking skills as an ability to think critically, students are more likely to present their expertise and performance by becoming effective critical thinkers and competent problem solvers.

2.6 Importance of Critical Thinking

Apparently, those students who are able to think critically have important and basic skills in teaching and learning (Issa& Khataibeh, 2021). They are able to investigate problems in a critical manner, produce novel ideas, theories and hypotheses. According to Kilbane & Milman (2017), they exhibit better performance in making logical decisions considering evidence and argument to address issues. Furthermore, Kim and Han (2016) assert that critical thinking skills are the most vital features of success in the 21st century. Based on Issa and Khataibeh (2021) critical thinking skills are essential in the process of learning by preparing students for a professional success through positive experience in authentic situations. In other words, the essence of critical thinking is retrospective, its existence is vital in every aspect of human's life. A wide range of studies have proved the essence of integrating critical thinking into curriculum of school and university education. Based on research conducted, it has been investigated that development of students' critical abilities leads to better knowledge retention, digestion of information, faster problem solving, argument mapping and academic excellence (Abrami et al., 2015; Roksa & Arum, 2011). As stated by annual report of World Economic Forum (2023), 76% of workers prioritize critical thinking in recognizing ethics role in AI, whereas medical workers emphasize the role of critical thinking in accurate diagnosis of health conditions. The Survey of Adults Skills (OECD, 2019) depicted that young people who scored high in critical thinking earn 32% more compared to those attaining lower results. Furthermore, adults with high critical thinking abilities are unlikely to stay unemployed (4.2%) compared to people with low results (8.9%). The given research results vividly demonstrate the essence of thinking critically in diverse parts of life.

2.7 Challenges in Fostering Critical Thinking

The integration of critical thinking skills and its vital importance in every aspect of human's life is undoubted, nevertheless, it faces a great number of hardships in the successful application both in education and daily life of people. One of the key difficulties is the institutional limit and curricular barriers, many universities, especially in the Post-Soviet context like Kazakhstan, mainly rely on lecture-based instruction by leaving little room for students' inquiry (Hernández-Torrano et al., 2021). According to the report by Nazarbayev University (2023), only 18% of Kazakhstani faculty explicitly teach critical thinking. Moreover, high-stake exams, such as the United National Testing conducted in Kazakhstan, focuses on rote memorization of materials excluding any opportunities for analytical thinking (OECD, 2023). Another obstacle identifies lack of training as one of the key obstacles in critical thinking focused pedagogy, based on findings 62% of faculty had no formal critical thinking instruction training (Chen et al., 2024). Cultural difficulties in terms of individualistic and collectivistic norms exhibit challenges for successful integration of critical thinking. According to Hernández-Torrano et al. (2021), countries with collectivistic inclinations may hesitate to question ideas and have a high resistance to ambiguity and open-ended problems. Similarly, a study in Japan found intervention of critical thinking less effective when it clashes with hierarchical norms (Tanaka, 2025).

2.8 Strategies to Develop Critical Thinking

Despite the serious character of existing issues on integration of critical thinking in mainstream education, there are numerous ways of addressing them through effective strategies. To illustrate, mandatory explicit instruction of critical thinking involving both sides, students and teachers. Additionally, educational reforms in terms of replacing high stake exams into portfolio

assessment and implementation of culturally relevant values and principles. However, the most advanced and effective intervention is the practice of active learning methods and scaffolded reflections. Traditional teaching methods are proven insufficient in cultivating analytical and metacognitive skills required by the 21st century workplaces (World Economic Forum, 2023). This gap underscores the necessity in integrating Project-Based Learning (PBL) in education. By structuring learning around real-world issues, it compels students to question assumption, engage in inquiry, and reason their thinking. In other words, it replenishes skills which are lacking in standardized exam systems and mainstream education (Zhang et al., 2023). Thus, PBL emerges not as an alternative approach to learning, but as a transformative solution to the critical thinking deficit in higher education.

2.9 PBL in Critical Thinking

2.9.1 Empirical research on Impact of PBL in Critical Thinking

While traditional teaching methods struggle in fostering critical thinking skills of students, global analyses demonstrate effectiveness of Project-Based Learning (PBL). A growing body of evidence revealed by Zhang et al. (2024) within 31 peer-reviewed studies have investigated that PBL treatment groups had either significant or medium effect size in critical thinking capabilities. Additionally, the data tentatively suggests that PBL's impact on critical thinking skills is maximized when projects mirror real-life cases and demand iterative problem solving. Moreover, the effectiveness of PBL is maximized across various educational stages, with high school students showing the highest improvements in critical thinking gains. Generally, students were able to acquire essential dimensions, including analysis of arguments and evidence evaluation techniques. Corroborating these findings, AlRasheed and Alghamdi (2023) tested the effect of PBL on medical students to identify the role of critical thinking in

accurate diagnosis. Study results demonstrated that PBL students excelled in argumentation and making conclusions compared to Case-Based Learning groups. To contextualize this framework, several studies have been thoroughly analysed at the level Kazakhstani universities. To illustrate, empirical investigation held by Nazarbayev University among 150 engineering students, 80 of them were practicing PBL, while the rest of 70 participants continued traditional learning. Based on outcomes, at the end of the year students overwhelmingly improved their critical thinking from 55th to 75th percentile by highlighting higher chances of getting job offers and increased average salary (Nazarbayev University, 2023). This aligns with Haddar et al. (2023) who determined a substantial increase in critical thinking capabilities of experimental group which achieved an average posttest score of 74% compared to the control group (62%) which was practicing guided inquiry learning model, even though their initial pre-test critical thinking scores were almost the same (35% and 34% respectively). The study conducted by Istiqomah & Aisyah (2024) among Islamic Religious Education investigated that students have developed their critical thinking skills, especially they experienced significant increases in analysis by learning how to break down essential concepts, evaluation, logical reasoning, reflection, decision making and problem-solving abilities.

The following research mainly focuses on the impact of PBL and traditional projects on students' abilities to think critically. Seminal work by Zhang and Ma (2023) established a significant difference between PBL group of STEM students and traditional ones synthesizing 66 experimental and quasi-experimental studies conducted within 2003 and 2023. The study claims that PBL students attained higher critical thinking score via alleviating iterative problems, whereas traditional group has demonstrated no significant results mostly being focused on technical correctness of the issue. This aligns with a similar study conducted by

Ospankulova et al. (2025) which employed science students among six universities in Kazakhstan and investigated the impact, attitudes, learning, and engagement of students after the intervention of PBL. As stated by the research findings, it has been determined that students critical thinking results and involvement in educational process were higher in PBL settings.

A research carried out by Sengerbekova et al. (2024) has assessed the influence of PBL on language proficiency of biology classes within Content and Language Integrated Learning in Kazakhstan across three schools. Another research conducted among Mexican EFL students who were working on 16-week PBL designing cultural guides for students illustrates remarkable improvement (40%) in speech production, specifically in doing requests and apologizing (González-Lloret, 2022).

Despite these findings, there are some controversial results in terms of PBL in improving students' critical thinking skills. A research design by Wang (2022) tested the effectiveness of PBL among EFL college students, it was found that while students demonstrated skills, such as analysis and evaluation, their overall critical thinking skills have not experienced any significant improvements. The given controversy suggests that PBL may not be universally applied in enhancing critical thinking skills of students, and it might be limited without specific strategies targeting critical thinking development. On top of that, the extant literature overlooks cultural resistance to PBL which has been demonstrated in the study by Tanaka (2025). The research has involved collectivistic classrooms involving Japanese and Kazakhstani students in order to assess the influence of PBL on their critical thinking skills. According to the results, the minority of Kazakhstani students has felt any improvements in critical thinking after PBL interventions, while American students reported about significant alterations in critical thinking gains. It has led to the conclusion that PBL may also depend on cultural alignment. Another research

highlighted existing PBL Paradox (Smith et al., 2022). Despite the fact that 70% students have reported critical thinking gains, 65% of them cited “excessive stress.” Liu et al. (2024) study has arisen another controversial issue in mismatch between how critical thinking is measured in PBL contexts, and how it manifests in real-world applications. When it comes to Kazakhstani context, the pilot study conducted by Nazarbayev University (2023) has shown mixed results in terms of implementing PBL among engineering and humanities students. While engineering students who practiced PBL presented significant improvements, humanities students depicted no significant changes. It has been explained by the fact that PBL tasks of engineering faculty aligned with analytical thinking, whereas humanities students emphasized the subjectivity of their tasks which lacked clear critical thinking assessment which leads to the conclusion that without specific rubrics critical thinking gains are likely to go unmeasured. Another interesting finding by Rusmini et al. (2021), students were able to develop their critical thinking skills, especially enhancing their communication and data analysis skills. However, students struggled with drawing conclusions (inference) based on abstract and incomplete data. This means that students require additional instructor scaffolding, as open-ended project left gaps in logical structuring,

The study conducted by Yu and Zin (2023) have important implications in identifying the role of PBL in critical thinking improvements of students. The systematic review revealed that although PBL has a potential to improve students’ critical thinking skills, its effectiveness cannot be considered consistent throughout studies. The review emphasized the need to adapt PBL models to focus more explicitly on critical thinking development, suggesting that without adaptations, PBL may not introduce desired results in this area. This study findings are in agreement with the study of Fitriyani et al. (2018) which clearly represented the effectiveness of PBL in improving both critical thinking capabilities and academic excellence of students. As

well as the study of Scott (1994) and Salam et al. (2016) which have investigated considerable improvements in social superiority, critical and cognitive thinking of PBL students. Rogti (2021) in the research paper revealed that students were able to develop their critical thinking competency by reaching the highest average score 100% after visiting five PBL sessions. Moreover, PBL intervention has improved students' engagement due to its cooperative nature. In general, the study shows that students critical thinking gains increased when students are fully familiarized with the project work, learning cooperative, peer reflection and questioning, debating and discussions. On top of that, a research carried out by Sengerbekova et al. (2024) has assessed the influence of PBL on language proficiency of biology classes within Content and Language Integrated Learning (CLIL) in Kazakhstan across three schools. Based on data collected, both students and teachers perceived PBL a positive practice, highlighting some possible challenges, such as large time commitment and difficulty in objective assessment. While the study did not measure critical thinking skills explicitly, improved classroom climate and positive attitudes conducive to developing critical thinking skills.

2.9.2 Perception of PBL in improving critical thinking skills by students

The critical thinking skills of students can progress over the implementation of PBL into the curriculum of classes, though the perception of PBL as an effective tool for increasing critical thinking capabilities can differ significantly. The study by Rochmahwati (2015) involved 25 EFL students to measure their perception after PBL intervention. Based on the results of interview and observations, students have reported positive attitude towards PBL by highlighting their increased engagement and identifying three main benefits. Primarily, they mentioned that PBL was much more effective and less stressful replacement for the written examination, next they enjoyed learning by doing, highlighting the part of collaboration in groups and improved

motivation towards gaining new knowledge. Likewise, Sari and Prasetyo (2021) conducted mixed research method including experiment and interview carried out among 26 EFL students. As stated by collected interview data, more than 77% of participants have reflected their big enthusiasm to learn about critical thinking through PBL model. Almost 89% of students noted increased engagement in learning after the intervention of PBL, whilst 80.56% students fulfilled their seven essential indicators of critical thinking. To illustrate, one of the respondents revealed that after PBL has been implemented into their classes, he/she learnt how to summarize the problem, make assumptions, present personal view and communicate the message correctly to peers. Overall, PBL created much open-minded atmosphere by influencing critical thinking skills of students.

The study by Hussein (2021) has revealed very essential concerns of PBL practice among students. While analysing students' reports on the project, the investigator has revealed that one of the biggest issues that students have to encounter is tight schedule which were not matching due to different academic classes of students and extra -curricular classes which limited their full involvement and devotion to the project work. Also, students felt uncertainty in terms of teacher expectation, format of the product, and collaboration strategies. Students referred to the shortage of experience and competence in some aspects which lead to disagreements and conflict in some cases. Another important lesson learned by group members was to plan time wisely, due to misunderstanding and unclear vision of possible benefits and drawback of the product, they had to make some changes in the middle of their work or even at the execution. Nevertheless, in general, students have reported very positive perception of PBL intervention by mentioning constant discussions, and facilitative assistance of teacher- and peer- feedback in the process. Overall, developing plans, defining responsibilities and structuring communication within groups

were mentioned as the key lessons gained from PBL execution. These findings align with the research outcomes of Crespi et al. (2022) which aimed to determine the role of PBL in communication skills. According to study outcomes, treatment group noticed substantial alterations in various ways of communication, including verbal, non-verbal, and social communication capabilities of students. Another study by Rogti (2021) has assessed students' motivation and critical thinking competency after PBL intervention. Students reported higher motivation when they were working in groups and dealing with one common issue.

The following study by Issa and Khataibeh (2021) examined the perception of PBL in fostering critical thinking skills from the perspectives of teachers. The study has shown that teachers believe that PBL contributed to effective improvements of critical thinking gains of students, especially in science compared to conventional methods of teaching. Moreover, teachers have reported about improved abilities in presentation and analytical thinking of PBL students. Nevertheless, the research by Ospankulova et al. (2023) has revealed that while PBL improved critical thinking and engagement of students, their attitudes toward PBL intervention were mixed, specifically female students perceived PBL as a positive practice compared to male ones.

CHAPTER 3

Methodology

The main aim of the research study is to investigate the impact of Project-Based Learning on a first-year TFL students' critical thinking abilities. Thus, the following section will provide information about the characteristics of the sampling, the research procedure, the main methods used to collect and analyse the results of the study, and some probable limitations of the study.

3.1 Research design

The mixed research method has been chosen as the most appropriate way of collecting the data results and address the research questions of the study. It presupposes the gathering of quantitative and qualitative data (Creswell & Creswell, 2017). Moreover, the research used sequential mixed-method design by incorporating initial elements of exploratory component. It means that the investigator has collected the quantitative results of the study by applying pre- and post-tests, and then qualitative part of the study has been held to explain and elaborate on the collected quantitative findings of students. Nevertheless, the implementation of pre-perception interview before PBL intervention suggests an exploratory element of sequential design, as these initial perceptions may have informed the implementation of the intervention. The quantitative part of the research is represented by quasi-experimentative study conducted among the first-year students majoring at the specialty of "Two Foreign Languages" in one private university in Kazakhstan. Also, the quasi-experiment design employed in this study is the pre-test and post-test control group design. According to Stratton (2019), they key advantage of pre-test and post-test design is the directional nature of the research meaning there is a testing of a dependent variable after and before intervention with an independent variable. The experiment has been conducted by implementing Project-Based Learning within the major English course study and

applying the pre- and post-tests in order to measure students' abilities to think critically. The following study can be considered as quasi due to some characteristics which have been re-defined to select participants of the research. As for the qualitative part of the study, the chief investigator carried out pre-perception interview to identify previous academic background of students and determine their experience and expectations from upcoming PBL intervention. Additionally, the qualitative method analysis on the second stage of research involved observation, post-perception interviews, and for increasing the reliability of the findings, reflective essays written by each group at the end of PBL intervention has been analysed to complement interview results of respondents. According to Creswell and Creswell (2017), a mixed method of research is a great combination which involves and utilizes the major strengths of quantitative and qualitative methods. Therefore, it is much more effective in addressing the complexity of the study and providing a deeper understanding of research problems. On top of that, in this research the first stage of quantitative methods was used to determine potential problems, conduct theoretical studies and formulate hypotheses, whereas the second stage of qualitative data methods was to prove, deepen, strengthen, and expand data for making conclusion of the research results.

3.2 Research sampling

Concerning the participants of the study, 66 students were invited to participate in the research experiment, 40 of them represent the experimental group where PBL intervened within the curriculum of the course, whereas 26 students are in the control group which follow the usual standard of traditional project method. Overall, 59 female students, and seven male students were involved in the study, particularly 34 females and 6 males of the treatment group, and 25 female students and one male student in the control group of the research. The research sampling is all

representative of the locals whose native language is either Kazakh or Russian languages. In order to draw samples from the population, purposive non-probability technique is used with some established criteria. It is necessary to be applied since the main requirement for participants is to be a first-year student of the university and acquire major degree at "Two Foreign Languages." Furthermore, the following sample has been chosen as the most convenient and accessible one for the chief investigator due to the foreign language course conducted among these groups directly by the researcher. This means that the researcher can easily access the participants and introduce variables into the class settings. The age of the respondents is likely to vary between 18 and 20 years old. All the minor-aged participants of the study have been withdrawn from the experiment, while the rest of students have been provided with ethical consent letter to agree on voluntary participation in the experiment. Also, both male and female students participated in the research. As a result, the pool of participants is rather homogenous as the study focuses only on students majoring in TFL in one private university in Kazakhstan, the inclusion of foreign students has been excluded due to possible differences in previous academic backgrounds, language proficiencies, and cultural perspectives which may confound my final study results.

3.3 Instrumentation

In this mixed-research method, the quantitative part of the research will be conducted thorough pre-test and post-test design of the quasi-experimental study. As a result, the researcher applied Watson- Glaser Critical Thinking Appraisal (WGCTA) for measuring control and treatment groups' critical thinking capabilities before and after the intervention of PBL variable. There are several reasons for choosing Watson-Glaser's test as the main tool of assessing critical thinking gains of participants. Firstly, WGCTA has a direct correlation with a real-world

decision making (Facione & Facione, 1994), thus presenting predictive validity for academic and workplace success (Sternod & French, 2016). Referring to official publisher of WGCTA – Pearson Assessment (2004) – it correlates with other critical thinking tests and has internal consistency throughout its application. Another essential aspect to cover is the coverage of essential domains, such inference, recognizing assumptions, deduction, interpretation, and evaluation of argument which align with Kazakhstani educational goals for improving students' critical thinking capabilities. Moreover, the test is linguistically easy and time efficient for the first-year students taking into considerations their average language proficiency in English. Overall, the test was provided twice in the beginning of the experimental study before the intervention of PBL, and to address the question over the effectiveness of PBL on students' critical thinking abilities, the same test was carried out after the ending of the project. Two naturally occurring groups, such as the control group (n=26), and the treatment group (n =40) were involved in the test taking process. For statistical data analysis and information storage – Jamovi – open-source computer program has been selected as the most user friendly and easy to be operated.

As regards the qualitative part of the study, to investigate the perception of PBL by students, semi-structured interview has been chosen as the most effective way to collect valid and reliable data. It helped the research gain some valuable insights with in-depth and context - rich perceptions of participants in terms of PBL implementation. Interviews have various advantages, one of the important ones is that it allows participants provide detailed information on their perceptions of PBL. Furthermore, the interview provides a control over the types on information received, as "the interviewer can ask specific questions to elicit this information" (Creswell, 2013). In this case, I used a semi-structured interview since it provided me with an

opportunity to delve into a topic of the research interest and understand provided answers. During the interview, students were asked mainly open-ended questions to allow them voice their experiences without feeling any constrains by any other researchers or perspective research findings. The interview type was conducted within one-on- one dialogue between respondent and research investigator. Furthermore, to complement and deepen into the external perceptions of students, the reflective essays which have been written at the end of PBL intervention were analysed. The reflective essay required students to describe their learning experiences, faced issues, and perceived enhancement in critical thinking after inclusion of PBL in mainstream classes.

The questions for an interview have been adapted from studies conducted by Jamilah (2024) and Subiyantoro (2024). The participants are provided with consent letters, as a result, they could withdraw from the study at any time without any penalty. Each interview lasted for approximately 15-25 minutes in the English language. The purpose of the study was introduced before starting the interview, students were told about some possible benefits and contribution of the study, as well as confidentiality issues. Each student was interviewed twice before and after the intervention of PBL, also all the conversations were audio-recorded on the mobile with the permission of the participants for transcribing reasons. In general, the interviews have been recorded among 12 students of the experimental group who voluntary agreed on expressing their perceptions, and 11 reflective essays have been collected for deeper analysis of students' experiences. These qualitative instruments aimed to capture personal, subjective, and contextual dimensions of how students engaged with the intervention and perceived its effects.

3.4 Data collection

The quasi experimentative study with PBL intervention has been conducted within Major English course instructed by the investigator of the research study within 10-15 weeks (one semester). Classes taught by the researcher have been categorized as the experimental group involving overall 40 students, whereas the classes conducted by colleagues, which mainly followed general curriculum and were exposed to traditional project method, were related to control groups which consisted of 26 students. Before conducting the experiment, the pilot study has been carried out by introducing major improvements to the project guidelines and general process. Due to the implementation of PBL among real-life students, ethic committee has requested the research proposal with detailed explanation of the research aim, questions, and the whole process of PBL intervention. The research proposal has been sent beforehand, and after obtaining official permission, the research investigator started the major execution of PBL projects. To gain agreement for voluntary participation in the project and other essential steps in the research procedure, such as the interview and pre- and post- tests on critical thinking, students were provided with ethical consent letters and given an opportunity to execute from the research at any time. Having gained pre-test results, students were exposed to seven important essentials of the Gold Standard PBL (Larmer et al., 2015) by being guided and directed by the teacher. Seven essentials include the aforementioned steps: identification of a problem, sustained inquiry, authenticity, students voice and choice, reflection and critique, and at the end students presented their final products to the audience of the university. A more detailed guide to the whole Gold Standard PBL project has been created and provided to the committee members in order to get acquainted with all the project steps and assignments held within one semester.

The project has been conducted between two major courses which are considered to be compulsory for the first-year students majoring at TFL. Based on guidelines of two courses, the first project within reading and writing course required students to create either a newspaper or a scientific journal based on topics covered within Spring semester. Meanwhile, the final product of the foreign language course involved students to create a guidebook on the most challenging issues of the modern world. Overall, within the project students had to complete seven main assignments meeting the Gold Standard PBL essential elements. Assignment number one required students to divide into groups of three or four students, come up with a driving questions of their project work and propose a topic. Each assignment has been thoroughly revised by the teacher who were proposing possible recommendations for a better improvement of the final artifact (step one: Identifying Problem/Driving Question). Following assignments asked students to revise their final theme of the product, decide on the format, conduct research and provide the list of reliable sources relevant for their work, provide the draft version of their planned work with possible deadlines, and structure the product. This assignment has been compiled based on the rest three essentials of the Gold Standard PBL, such as Sustained Inquiry, Authenticity, Students Voice and Choice. Assignments three and four were mainly focused on gaining external feedback from peer-reviewers and the teacher. Students put efforts to introduce new alterations and reflect on the critique. It has been done within the following steps of PBL, such as Reflection and Critiques and Revision. The last two assignments focused on introducing the final remarks and preparing for the final product representation, as well as reflecting the project process, and inviting external evaluators for objectives assessment of the final artifact. The last step of the Gold Standard PBL can be considered as one on of the most distinctive elements due to its public nature compared to other teaching methods. This year participants

have not only presented their final products within project exhibition, but they have participated in a series of PBL workshops and were evaluated by PBL experts invited from the specialized PBL school of the country.

After finishing with the final artifacts, volunteers were interviewed in order to investigate their experience of participating in PBL projects and identify general impressions of PBL intervention. Moreover, reflective essays have been collected for reliability purposes in order to check and determine the consistency of students' perceptions.

3.5 Data Analysis

All study participants which involve 66 1st-year TFL students completed the Watson-Glaser critical thinking test. All quantitative results have been divided into pre-test and post-test scores, also gain score results (post-test minus pre-test) were calculated for each participant of the treatment and control groups. Before conducting inferential statistics, descriptive statistical analysis has been applied to provide a clear summary and overview of data by providing solid foundation for further steps. Mean and standard deviation have been applied to investigate central measures of tendency for pre-test, post-test, and gain scores of critical thinking abilities of the control and treatment groups. Furthermore, the mean and standard deviation of pre-test scores have been analysed to test hypotheses whether the level of critical thinking of the treatment and control groups were at the same point before PBL intervention. Whereas, the mean and standard deviation of the post-test scores were used to identify a possible effect of PBL on critical thinking capabilities of students. Prior conducting and testing data for practical significance, it has been decided to check normality distribution in the average of students' gain score in order to check whether the sample data comes from normally distributed populations. The tool such as Shapiro-Wilk test has been used to measure whether or not the test outcomes

are violated. Due to the fact that gain score has not violated this assumption, and the study was comparing two independent groups, Independent Samples Students' T-test has been conducted in order to identify effectiveness of PBL intervention and any possible changes which took place in critical thinking abilities of students over time. Additionally, the study has investigated the mean and standard deviation of the individual subskills of critical thinking to identify where exactly the alteration took place both in control and treatment groups. Following this, the results were analysed using Independent Student's T-test to strengthen descriptive study findings and present the practical significance of research results.

The qualitative part of this research is represented by a semi-structured interview with open-ended questions and reflective essays, which were collected, anonymized and transcribed. To deeply analyse gathered data, the choice was made towards implementing a thematic analysis that was done manually. According to Caufield (2022), this type of analysis provides researchers with an opportunity to gather new information about the participants and their beliefs regarding certain issues. For the study, I have applied inductive variant of thematic analysis without imposing any pre-defined assumptions and make themes emerge from the data itself. That is why, I have adapted Braun and Clarke (2006) a 6-step model of thematic analysis. First of all, I familiarised myself with the answers that the respondents gave regarding their general experience and effectiveness of PBL in fostering their critical thinking gains. Next, initial codes were generated to search for the main themes. Having identified some common opinions, they were combined together so that there would be a short and concise description of students' experiences within PBL intervention. In addition, as some respondents gave off-topic answers for the open-ended questions, these cases were not taken into account while analysing the results.

The same procedure has been applied both for pre- and post-perception interviews involving reflective essays together.

3.6 Validity and Reliability

To achieve the validity and reliability of the research, the quality of data is ensured. It is important to highlight that questions for the study are designed after the revision of a significant number of research papers. To illustrate, questions for the semi-structured interview, conducted before and after PBL intervention, have been adopted from studies conducted by Jamilah (2024) and Subiyantoro (2024). Following this step, the questions were discussed and revised by the academic supervisor and people who have good expertise in a research area. After correcting all the remarks, the questions have undergone through pilot study to check the clarity and accuracy of the questions. Then, certain corrections were made based on the feedback from the pilot study participants and examples of answers were given not to mislead the respondents. Finally, the questions were used for pre-perception and post-perception interviews. Moreover, for reliability reasons, reflective essays have also been thoroughly analysed to gain deeper perception of students, and capture all possible perspective views on the introduced intervention. Likewise, the project has witnessed several corrections by being tested by the pilot study group during winter semester. Based on feedback provided, several corrections including the duration of the projects, topics and feedback were taken into account. Next, project has been discussed with several experts and existing PBL practitioners of the university, as well as thesis supervisor. According to their feedback, several remarks have been introduced and overviewed by the Research Ethics Committee. After continuous process of testing and pilot studying, the experiment has been executed among treatment groups. Additionally, to increase the internal validity of the results,

the control group has been involved to escalate possible effect of PBL intervention, credibility, and reduce possible biases.

3.7 Ethical Concerns

As regards ethical concerns, before conducting the study, I have gone through the research ethics committee survey in order to gain the permission. The research proposal was sent prior to the experiment execution and PBL intervention. After gaining the acceptance from the ethical committee members, consent letters have been given to all the research participants by excluding all minor-aged students, and students who refused to proceed in further research investigation. The consent letter explained the aim of the study, confidentiality issues, potential risks and the researchers' contact details. Also, the participation in the study was absolutely voluntary and the respondents reserved the right to withdraw from the study if they faced any ethical issues with no future worsening of relationships with researchers or their academic institution.

CHAPTER 4

Results and Findings

This section of research paper elaborates on collected findings of the study by presenting and deeply evaluating quantitative outcomes of pre-test and post-test design, as well as the qualitative results of conducted interview.

4.1 Quantitative Results of the Study

Generally, 66 students of the 1st year majoring at "Two Foreign Languages" specialty have participated in the research procedure. All of them have been acquainted with the consent letter in order to continue their voluntary participation both in experimental part and qualitative part of the study. Primarily, research results will present descriptive and inferential data of overall critical thinking gains, proceeding with individual evaluation of separate critical thinking dimensions and complemented interview results.

Descriptive statistics calculated to summarize the pre-test scores of both the control and treatment groups. According to Table 1, both groups had identical pre-test mean scores (M=10.3), indicating that the groups started at the same level of critical thinking abilities. The control group (n=26) had a standard deviation of 2.24, while the treatment group (n=40) had a slightly higher standard deviation at 3.34. This assumes a greater variability in pre-test results within treatment group compared to the control one. This finding suggests that both groups started at a comparable level prior to PBL intervention, supporting the internal validity of subsequent comparisons.

Table 1

Descriptive Data of Pre- Test Scores

		n	Mean	Standard Deviation
Group	Control	26	10.3	2.24
	Treatment	40	10.3	3.34

Note. n – number of students.

Following the intervention, post-test scores were analysed to evaluate possible changes in critical thinking performance of students. As shown in Table 2, the treatment group had a slightly higher results of post-test mean scores (M= 11) in comparison to the control group (10.4).

In addition to the mean scores, the standard deviations indicate variability of score within each group. Conversely to pre-test score results, the control group exhibited greater variability (SD =3.05) than the treatment group (SD = 2.79), suggesting that scores in the treatment group were more consistently clustered around the mean. This could imply to a uniform effect of PBL intervention, however further inferential statistical testing is required to assess the significance of these findings.

Table 2

Descriptive Data of Post-Test Scores

		n	Mean	Standard Deviation
Group	Control	26	10.4	3.05
	Treatment	40	11.0	2.79

Note. n - number of students.

To examine whether there was a significant difference in performance between the control and treatment groups, gain scores were calculated by subtracting pre-test scores of students from post-test scores for each participant individually.

Descriptive statistics revealed that treatment group (n=40) had a higher mean gain score (M=0.73) compared to control group (M= 0.08). This implies that treatment group has shown greater improvement from pre- to post-test (Table 3).

As regards standard deviation results, it is around 3.2-3.3 in both groups, which indicates a relatively wide spread of scores. This means that both control and treatment groups' students have benefitted differently – some improved their critical thinking abilities significantly, some of them not at all (Table 3).

Table 3

Descriptive Data of Gain Scores

		n	Mean	Standard Deviation
Group	Control	26	+0.0769	3.24
	Treatment	40	+0.725	3.31

Note. n - number of students.

Before moving to the inferential statistical data, gain scores of control and treatment groups' students have been tested for normality distribution through Shapiro-Wilk test. A p-value <0.05 would indicate a violation of normality. According to Table 4, it can be noticed that the treatment group's data was normally distributed (W = 0.958, p = 0.140), as the p-value was above the 0.05 significance threshold. Nevertheless, the control group's data slightly violated the assumption of normality (W = 0.920, p = 0.045), as the p-value was just below 0.05.

Table 4

Normality Distribution of Gain Scores

Group	Shapiro Wilk W	p-value
Control	0.920	0.045
Treatment	0.958	0.140

Note. A W-value closer to 1 suggests the data are more normally distributed.
p < 0.05, the data significantly deviate from normality. p> 0.05, the data not significantly differ from a normal distribution.

Despite the mild violation of normality in the control group (p = 0.045), the Independent Student's T-test was conducted, as the test considers robust to minor deviations from normality, the sample size was sufficiently large and group variances were approximately equal.

Based on study results – including the t-value of -0.784, degrees of freedom (df) = 6, and a p-value = 0.436, it can be concluded that the difference in gain scores between the control and treatment groups was not statistically significant. Therefore, the null hypothesis, which stated that there is no difference between the groups, was not rejected (Table 5).

Table 5

The Independent Samples Student's t-test of Gain Scores

		Statistic	df	p
Gain Score	Student's t	-0.784	64.0	0.436

Note. t - test statistic that measures the size of the difference between groups means, larger absolute t-value suggests a greater difference between groups. df (degrees of freedom) - it adjusts the test for reliability. p -value < 0.05, the difference between groups statistically significant. p-value> 0.05, the difference is not significant.

In addition to measuring the overall improvement in students critical thinking skills, the study also examined changes across five specific dimensions of critical thinking derived from Watson-Glaser Test, which include Inference, Recognition of Assumptions, Deduction, Interpretation, and Evaluation of Arguments.

Table 6 presents the descriptive statistics of critical thinking subskills across both the control and treatment groups, including pre-test and post-test mean scores, standard deviations (SD), and gain scores. According to Table 7, the control group has demonstrated noticeable improvements in inference subskill, with a gain score of +0.54, whereas the treatment group witnessed a slight decrease of -0.11. This may suggest that the traditional method used with the control group may have been more effective for enhancing inference skills compared to PBL intervention.

As regards assumptions, the control group revealed a decline in performance of assumptions (-0.23), while the treatment group demonstrated a slight improvement (0.05). It

indicates that the intervention may have helped maintain or slightly develop students' ability to recognize assumption despite the marginal gain. When it comes to the subskill of deduction, both groups illustrated insignificant positive changes. The control group had a gain of +0.04, whilst the treatment group showed a greater gain of +0.18, suggesting that the treatment had a modest positive effect on the subskill.

As stated by Table 6, interpretation skills of students in control group declined (-0.12), whereas the treatment group improved by +0.43, depicting one of the most notable positive changes. This suggest that the intervention was particularly effective in enhancing interpretation abilities. Evaluation of arguments subskill of critical thinking fell slightly in control group (-0.08), while the treatment group enhanced significantly by +0.25, showing a relatively higher and stronger development of this skill among the treatment participants.

Generally, the treatment group demonstrated greater gains in deduction, interpretation, and arguments, whilst the control group outperformed the treatment group in inference. The results suggest that the treatment was effective in enhancing specific critical thinking dimensions – particularly interpretation and arguments – even though it did not exceed the results of the control group in all areas.

Table 6

Descriptive Data of Critical Thinking Subskills

Subskill (m)	Group	Pre-test Mean (SD)	Post-test Mean (SD)	Gain Score
Inference (4)	Control	1.15 (1.32)	1.69 (1.35)	+0.54
	Treatment	1.68 (1.33)	1.57 (1.41)	-0.11
Assumptions (4)	Control	2.96 (0.774)	2.73 (1.00)	-0.23
	Treatment	2.65 (0.893)	2.7 (1.02)	+0.05
Deduction (3)	Control	2.04 (0.774)	2.08 (0.688)	+0.04
	Treatment	2.27 (0.847)	2.45 (0.597)	+0.18
Interpretation (3)	Control	2.08 (0.845)	1.96 (1.04)	-0.12
	Treatment	1.65 (1.03)	2.08 (0.888)	+0.43
Arguments (3)	Control	2.04 (0.824)	1.96 (0.871)	-0.08
	Treatment	1.95 (0.815)	2.2 (0.939)	+0.25

Note. SD - standard deviation. m- maximum score possible to gain in each critical thinking dimension.

To determine statistical and practical significance of above-mentioned results, Paired T-Test involving Cohen' effect size have been applied to evaluate the effect of the intervention on students' critical thinking subskills. The paired samples t-tests observed none of the differences between pre-test and post-test scores were statistically significant (all p-values > 0.05). This may imply to the idea that the observed changes in subskills occurred by chance rather than due to the intervention (Table 7).

To check the study results for practical significance, Cohen's (1988) effect size (|d|) has been applied. Based on interpretation guidelines, effect sizes closer to 0 are likely to have smaller practical significance or negligible at all. According to Table 8, all effect sizes were very

small (|d| < 0.2), meaning that the intervention had minimal to no practical impact on participant's cognitive skills. Despite the fact that the largest effect was for Interpretation (|d| = -0.1719), it considered as a trivial effect in most research contexts. Negative values reveal a slight decline in scores, but the magnitude is too small to be meaningful.

Table 7

The Paired Samples t-test of Pretest and Posttest Scores. Cohen's Effect Size

			Statistic	df	p		Effect Size
InferencePre	InferencePost	Students' t	-0.747	65	0.458	Cohen's d	-0.0920
AssumptionPre	AssumptionPost	Students' t	0.406	65	0.686	Cohen's d	0.0499
DeductionPre	DeductionPost	Students' t	-0.970	65	0.336	Cohen's d	-0.1194
IntepretationPre	InterpretationPost	Students' t	-1.396	65	0.167	Cohen's d	-0.1719
ArgumentsPre	Arguments Post	Students' t	-0.871	65	0.387	Cohen's d	-0.1072

Note. df (degrees of freedom) - the number of independent values in the data. Here, df = 65 indicates 66 participants were included in the analysis. p-value (p) – probability of observing the results. A p-value> 0.05 suggests insufficient evidence to reject H0. Effect Size (Cohen's d) – quantifies the magnitude of differences between Pre- and Post-scores, independent of sample size. |d|< 0.2: negligible effect size, 0.2 ≤ |d| < 0.5: Small effect. 0.5 ≤ |d| < 0.8: Medium effect. |d| ≥ 0.8: Large effect.

4.2 Qualitative Results of the Study

4.2.1 Pre-Perception Interview Results

The qualitative part of the study is represented by the semi-structured interview following a 6-step thematic analysis (Caufield, 2022). Initially, the chief investigator has conducted the pre-perception interview before PBL intervention in order to investigate the academic background of students, their preliminary knowledge and experience in PBL and Critical -

Thinking. Based on interview results, four main themes have been identified with some related subthemes.

Theme 1 mainly summarized and analysed students' perspectives on critical thinking which have been further divided into 3 main subcategories, such as definitions of critical thinking, examples from personal life, and their self-assessment of skills. According to students' responses, they primarily associated critical thinking with logical reasoning, problem-solving, and evaluating information sources. The majority of them referred to "thinking outside of the box" and "making logical decisions" as essential aspects.

"Critical thinking is when you understand the situation and get the correct answer. It helps in solving problems and making logical decisions." (Participant 1)

When students were asked to provide examples where critical thinking assisted them in real-life situations, the majority of them mentioned about examples of choosing a university, and solving daily life issues at the university settings when they are away from their parents.

"I had to think critically when my parents had different opinions on where I should study." (Participant 4)

Moreover, their self-assessment of critical-thinking abilities ranges from 3 to 8 out of 10. Many of them believed that they possess moderate level of critical thinking recognizing some possible skill gaps. Students highlighted that their critical thinking abilities are good at evaluating information and making logical reasoning. Nevertheless, sometimes they tend to be emotionally biased due to lack of practice.

The following Theme 2 used to describe what learning activities stated by students helped them to develop critical thinking skills. According to received responses, the majority of students highlighted the effectiveness of group-discussions, debates, problem-solving, and

interactive activities, such as role-plays. They also mentioned about the value of teacher feedback in improving reasoning and clarity.

"Debating over different opinions helps me develop my critical thinking. I always argue and try to find counterarguments." (Participant 3)

The following questions specifically related to students' background in PBL, their overall perception and comprehension of PBL in learning. All students viewed PBL as collaborative and student- centered approach focused on real-world application.

"PBL is about communication and planning. We assign different tasks to each other and work together to achieve the goal." (Participant 7)

The following questions concerned benefits and drawbacks of PBL based on students' perceptions. While the majority of them believe that PBL may be extremely helpful in enhancing communication and leadership skills, they also reported some challenges, such as teamwork and unequal task distribution.

"I ended up doing all the work." (Participant 7)

The last few questions required students to reflect whether PBL can have any impact on critical thinking capabilities of students. According to responses, students emphasized that PBL demanded research, encouraged deeper understanding, and developed their analytical and decision-making skills. They moved beyond the memorization to real application of knowledge and gained experience.

"In PBL, you must filter unnecessary information and only present the most relevant data." (Participant 10)

These findings reveal that students had some foundational understandings of critical thinking, however, their experience in application of such skills was often context- dependent

and underdeveloped. The interview results also indicate that students feel enthusiastic towards PBL and challenges within the PBL approach. These insights were instrumental in structuring the intervention phase of PBL, which was specifically designed to implement structured and balanced PBL activities to further foster critical thinking.

4.2.2 Post- Perception Interview Results

After the intervention has been introduced and the experiment has been finished, the chief investigator conducted post-perception interview in order to investigate students' perception of Gold Standard PBL. The same participants have been interviewed involving reflective essays of other experiment participants in order to increase the reliability of results. The same a 6-step thematic analysis have been used to interpret the data. Overall, analysis has identified five key themes that encapsulate students' general perceptions of PBL its impact on their experience. These themes were developed through careful coding and accurate pattern recognition.

The first theme revealed enhanced critical thinking capabilities of students through real-world application, students reported that PBL developed their critical thinking by requiring them to involve more deeply with information process, analyze complex topics, and evaluate reliability of the sources. They highlighted a shift from passive learning to a more investigative and reflective approach.

"Now I'm more analytical. After PBL, because you have to find the problem first." (Participant 7)

"We learned how to find more than just one solution." (Participant 8)

"Now we don't trust just anything we see online." (Participant 10)

These reflections suggest that students started approaching academic tasks more critically, recognizing the importance of questioning information rather than accepting it at once. This indicates a growing sense of academic maturity.

The second theme of the interview reveals some possible challenges that students confronted while PBL intervention. While some students noted the positive effect of PBL on their critical thinking abilities, some of them acknowledged that working in teams presented challenges. The majority of them highlighted issues, such as uneven contribution, scheduling conflicts, and differing work ethics. Despite this, they emphasized personal growth and better understanding of teamwork dynamics. Most participants ultimately perceived these difficulties as learning opportunities which developed their communication, leadership, and conflict resolution skills.

"Four of us were thinking differently and it was hard to collaborate and create one product." (Participant 7)

"We had a lot of arguing because I wanted 100% and they though 70% was enough." (Participant 11)

"It was so hard to collaborate with our team… we had to deal with finding one time when everyone is free." (Participant 2)

In the following Theme 3, students expressed very strong emotional investment in the authenticity and practicality of their tasks. Creating real-life and tangible products, such as journals and guidebooks, and participating in public exhibitions led to a greater sense of ownership, motivation, and pride in their work.

"We even had a dress code for the exhibition and thought of every detail." (Participant 7)

Another described how the project changed their personal habits:

"I decided to reduce meat to be more eco-friendly after learning about emissions." (Participant 4)

Whereas, the opportunity to present their final work in public made some of them feel motivated and inspired:

"When I was explaining to the speakers, I felt engaged and proud." (Participant 2)

These experiences were highlighted not as routine assignments, but as meaningful milestones that contributed to personal and academic identity formation.

The following theme (Theme 4) reveals challenges in navigating information sources, students reported that finding credible sources, especially for academic referencing, was one of the most common challenges. Students reflected on how difficult it was to locate trustworthy information, particularly while using different online resources.

"It was really hard to find real stories…. Chat GPT lied to us." (Participant 6)

"The hardest part was finding real-based information." (Participant 10)

"There was a lot of information, but no space… So, it was hard." (Participant 7)

Although students had to witness particular frustration, it made them become more resourceful and attentive to academic integrity, especially in terms of data citation and source validity.

The last theme touched the topic of comparing PBL activities to previous learning experience that participants of the study could have. Many highlighted how PBL is different from traditional, test – focused or passive methods by fostering creativity, ownership, and deeper engagement. All of them expressed a desire to see PBL integrated more widely into their

curriculum, particularly in courses where creativity, communication, and real-world problem-solving are essential.

"Other teachers gave us materials and we had to create. But in PBL, we started from nothing." (Participant 9)

"Before, we just read books. Now we search, explore, and reflect." (Participant 12)

"This project took free months… I value it more than other projects." (Participant 7)

In general, students' perceptions of PBL were highly positive, the majority of them describe their experience as transformative. The themes illustrate how PBL encouraged deeper thinking, fostered teamwork, presented meaningful challenges, and provided an educational experience that many students found more engaging and relevant than conventional learning methods.

CHAPTER 5

Discussion

This research was mainly focused on investigating the impact of Project-Based Learning (PBL) on critical thinking capabilities of students and students' perceptions of PBL in practice. The discussion part will compare the study results with those of other researches to find some possible similarities and limitations of the study and propose some different recommendations for further research.

Based on research findings, it can be clearly seen that PBL has no significant influence on students' critical thinking skills. Despite the fact that the mean of the treatment group outperformed the control one, based on inferential statistical analysis these results cannot be considered as practically essential. This finding is supported by Haddar et al. (2023) that similarly revealed significant post-test mean results in experimental groups compared to the control one. Moreover, in both studies students started almost at the same level of critical thinking. However, both research results did not possess any practical significance in inferential statistical data. Similar findings of post-test mean scores have been indicated by Anazifa and Djukri (2017). Furthermore, modest critical thinking gains corresponds with findings from Yu & Zin (2023), who claims that PBL has a more remarkable impact on long-term involvement compared to a short-term test performance. Likewise, Rochmahwati & Rohaeti (2017) highlights that meaningful learning which includes real-life cases, such as PBL, enable students to think critically, even though standardized measurements fail to detect immediate large improvements. Research findings can also be supported by Wang (2022) and Tanaka (2025) who depicted no significant improvements in critical thinking abilities of students due to cultural resistance to innovative approaches. Similarly, in my research students have also mentioned ambiguity issues

when it comes to freedom of choice in the project selection. The majority of them confronted issues with autonomy that they were given to make solid decision in terms of their successful project work. Moreover, the study results agree with the pilot study results conducted by Nazarbayev University where humanities students did not illustrate any remarkable alterations in critical thinking abilities due to the subjectivity of their tasks and lack of criteria.

As regards the evaluation of individual dimensions of critical thinking skills, Sumardiana et al. (2019) revealed that STEM-based PBL can be very effective in improving evaluation and reasoning subskills, findings echoed in this study's treatment group performance. Additionally, the integration of STEAM and PBL models in research by Haddar et al. (2023) and the success of students in forming arguments and presenting project publicly align with the growth observed in the treatment's group argumentation subskill. Likewise, a slight increase in deduction skills of the treatment group correlated with Istiqomah et al. (2024), who emphasized the value of practical, problem-based activities in sharpening logical reasoning. Similarly, students have also developed their evaluation and analysing subskills.

The decline in Inference subskill of the treatment group may represent possible limitations in how PBL fosters this particular dimension of critical thinking. Inference involves drawing conclusions from abstract data, which is likely to be developed through structured practice than open-ended inquiry. This pattern resembles findings by Rusmini (2021) who emphasized the need for intentional scaffolding of inferencing skills within PBL by providing extra guided frameworks, such as templates, illustrations and examples to complement PBL's open-ended nature.

Significant improvement in Interpretation and Recognition of Assumptions identified in the treatment group corresponds to the model proposed by Thomas (2000), where structured PBL

stages such as sustained inquiry and critiques lead to better understanding of multiple perspectives and deeper analysis.

The qualitative findings of the study significantly strengthen the quantitative results of the study. Previous studies have consistently reported that students feel highly positive towards PBL, Rochmahwati (2015) identified that EFL students perceive PBL as a less stressful and more engaging alternative to traditional written exams, particularly emphasizing the usefulness of group collaboration and "learning by doing" nature of tasks. These findings resonate strongly with the responses of participants in the present study, who described their experience in PBL as an involving, autonomous, and emotionally invested in their projects. The majority of students reported a shift from passive to active learning and expressed pride in completing meaningful, real- world tasks mirroring what Sari and Prasetyo (2021) identified as increased enthusiasm and inducement to enhance critical thinking through PBL. These findings mirrored the participants' descriptions of deeper learning and personal investment. The similar results can be observed in the study by Lesman et al. (2023) and Sengerbekova et al. (2024) who noted that the majority of students reported about high learning interest after PBL intervention compared to traditional teaching methods, the majority of participants have also highlighted improved classroom climate and positive attitude towards PBL implementation. However, conversely to research results by Ospankulova et al. (2025), all male and female students in my research reflected highly positive towards PBL intervention without any divisions on gender perceptions.

Similarly, students in my study highlighted how PBL encouraged them to make decisions, evaluate evidence, forming personal viewpoints, and present ideas which can be assumed as all essential indicators of critical engagement. This is closely aligned with the self-reported gains described by Sari and Prasetyo (2021) where 80.56% of students revealed

fulfilling core indicators of critical thinking. The research findings can also be further supported by Rogti (2021), who noted thar working on shared authentic problems in groups tend to rise motivation and stronger critical engagement which have also been consistently highlighted by the research participants.

Even though the majority of students felt uniformly positive towards PBL implementation, some of them voiced concerns about unequal participation, time scheduling and lack of experience in PBL environments. The mentioned difficulties have also been introduced by Hussein (2021) where he highlighted barriers, such as scheduling conflicts, mismatching time and unclear expectations, which tend to hinder students' abilities to fully engage in PBL process. It corresponds with the study results by Abishova et al. (2020), despite increased motivation and learning engagement, students mentioned about excessive stress and curriculum difficulties. Likewise, the participants of the study mentioned that while teacher and peer feedback can be helpful, a lack of structure lead to confusion and conflict. Nevertheless, in the given research, while these issues created frustration, students generally viewed them as learning opportunities which improved their teamwork, time planning, and communication strategies.

Another essential theme concerns the issue of emotional and cognitive involvement triggered by authentic tasks. Students mentioned that they feel proud of their projects and became more thoughtful and sensible about real-world implication. This goes in line with experiences mentioned by Crespi et al. (2022), who reported that PBL positively affects not only cognitive but also communicative and social dimensions of learning.

Overall, students perceive PBL as highly positive practice and transformative experience that contribute to the improvement of critical thinking and provide valuable opportunities for

analysis, evaluation, and collaboration, in spite of some structural and interpersonal difficulties which were noted by respondents.

CHAPTER 6

Conclusion

The role of critical thinking in the modern world cannot be doubted due to remarkable improvements which are happening almost in all aspects of the daily life. There is a big necessity for young people to acquire, such an essential skill as critical thinking to effectively deal with various obstacles which they are likely to confront both in professional and daily parts of their living. The figures of OECD (2019) and PISA (2022) annual surveys demonstrate that the majority of Kazakhstani students possess extremely low results in problem solving and critical thinking capabilities leading to the conclusion that Kazakhstani young members of society lack crucial skills in order to obtain better results in professional sphere and be competitive internationally. Therefore, the main objective for the educational area of Kazakhstan is to introduce innovative approaches both in higher and secondary educational institutions in order to produce a generation which possesses important skills of the 21st century required in a global job market. One of the innovative approaches which is gaining popularity in modern teaching practices is Project-Based Learning (PBL). PBL mainly focuses on sustained inquiry and iterative problem-solving, students eagerly work on solving taxing modern issues guided by a driving question throughout the process. Despite the fact that there are numerous scientific studies conducted globally on the issue of PBL and critical thinking, the given topic still stays quite novel for Kazakhstani educational context, especially in terms of the higher education.

Based on literature review, the majority of study results illustrate positive improvements in critical thinking capabilities after the intervention of PBL, though some of them demonstrate no significant changes. However, none of studies presented negative alterations in critical thinking skills of students impacted by PBL. Moreover, students' perceptions of PBL are highly

positive, even though some difficulties have been mentioned, such as lack of experience, scheduling difficulties and uneven contribution. The majority of studies highlight an increased engagement, motivation and cognitive development.

Mostly, the findings of the study correspond with those discussed in the literature review. As regards the impact of PBL on critical thinking, despite the fact that descriptive statistics has shown positive improvements of critical thinking, practically these changes are not significant. The pre-test mean scores of the treatment and control groups were at the same level before PBL intervention, therefore, post-test results illustrate very objective and valid effects of an independent variable. While the treatment group outperformed the control group in post-test mean scores, their gain score results inferentially did not possess any significance. This means that a slight improvement of the treatment group in post-test are not directly related to PBL intervention. It is likely to take place due to other confound variables or external influence of other potential factors.

However, complementary qualitative results strengthen the quantitative ones by acknowledging positive perception of PBL by the university students. Based on qualitative data analysis, possible limitations in attaining practically significant enhancement of critical thinking capabilities of students could depend on individual challenges of students. Some of them mentioned that they had mismatching schedules with other group members in order to discuss project work assignments. It complicated the process of effective and qualitative collaboration. Other students raised the issue of time-management. Due to the fact that projects are one of the main assignments within assessment rubrics, students felt excessive stress and overloads which made them postpone their assignments up until the deadline and put less efforts than they could contribute to their project work. Also, some of them mentioned about unequal contribution to the

project work among their group members. Some students were ready to work on maximum, whereas some participants treated the project without any extra enthusiasm. It could be one of the possible reasons why some students gained high results in the post-test results, while some of them either stayed on the same level or even experienced a slight decrease. In addition, taking into considerations that majority students are the first-year students, and they have just finished the school, most of them lack essential metacognitive and self-regulated skills necessary for successful execution of project works.

Nonetheless, the majority of students reported that they feel extremely proud of their project work, especially when they defended their projects publicly at the annual exhibition. The emphasized that they become much more confident and academically mature. Also, many of them highlighted that their critical thinking abilities enhanced, they become more proficient in research and media literacy. Participants reflected that in the beginning it was challenging to filter and search for information on the Internet due to the overwhelming amount of data. However, at the end they mastered research skill and find it very helpful in the future. Moreover, they highlighted that now they completely comprehended the essence of citations and academic integrity in the learning process. Also, they reported about enhanced collaboration skills due to the fact that they had to work in one group throughout the semester, learn how to delegate and complete tasks appropriately and within the given time. They emphasized the usefulness of teacher feedback and peer-reflection in the guiding process. Some of them said that having a completely different perspective on your own work and gaining helpful feedback facilitated and improved their general project work. Overall, students noted considerable changes in cognitive development, motivation, and engagement in the learning process.

In terms of possible limitations of the study, despite the fact that the research has revealed some possible causes of insignificant improvement in critical thinking capabilities, the following study could focus on exploring in-depth reasons of the given tendency. Furthermore, the study involved only 66 participants and all of them were representatives of the first-year majoring at the specialty of "Two Foreign Languages" in one private university of Kazakhstan which means that the sample was very homogenous representing only future English teachers, and it is quite difficult to generalize these findings to broader EFL contexts or other educational settings. The following study could include more research participants of different backgrounds, various specialties and different years of studies in order to gain broader view on the given issue. Additionally, the PBL intervention for a semester can be considered as quite short to acquire any long-term results of PBL on critical thinking capabilities of students. As a result, future studies could implement PBL across a full academic year or multiple semesters to observe long-term cognitive improvement at more significant quantitative outcomes. Finally, The Watson-Glaser Critical Thinking Appraisal primarily measures individual analytical skills, thus omitting collaborative, creative, and communication-based critical thinking developed during PBL. Complementary assessment tools, such as peer-reviews, portfolios, and observation rubrics could be used to fulfill the deficiency in the following research studies.

In conclusion, the research attempted to shed a light on investigating the influence of Project-Based Learning on students' critical thinking capabilities and their perception of PBL in practice, particularly in terms of higher educational institutions in Kazakhstan. It revealed that students perceive PBL as extremely advantageous teaching practice, even though the quantitative results did not attribute any practically significant improvements in critical thinking of the treatment group. Thus, it is hoped that further studies will take into considerations all limitations

of this research by practicing the application of PBL among university students and exploring the effectiveness of PBL from different perspectives.

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Appendix A

Research Ethics Committee Permission

Research Ethics Committee <rethics@sdu.edu.kz> Fri, Feb 28, 9:20 AM

to me

Dear Laura Lyadova,
Please review the feedback provided by REC:

DISCUSSION:

3. The research conducted by Laura Lyadova, a master's student in the Two Foreign Languages program at the Faculty of Education and Humanities, was reviewed. The following points were noted for clarification and improvement:

- no comments were provided;

DECISION:

3. The research work of Laura Lyadova, «The Impact of Project-Based Learning in Fostering Critical Thinking Skills of the 1st Year TFL Students,» was approved by the Research Ethics Committee;

Appendix B

Consent Letter

SDU University Research Ethics Committee

Informed Consent Form

You are invited to participate in a research study entitled "The impact of Project-Based Learning in Fostering Critical Thinking Skills of the 1st year TFL Students"

Research Purpose and Procedures.

This study aims to explore the impact of Project-Based Learning (PBL) on students' critical thinking skills and to identify the perception of PBL among 1st year TFL students.
This quasi-experimental research study will take place over one academic semester (10-15 weeks) within the Major English course. You may also take part in one-on-one interviews (15-25 minutes) to share your perspectives on PBL. These interviews will be audio-recorded with your permission.

Possible risks and discomfort related to participation in this research:

There are minimal risks, such as the time required for tests and interviews conducted to assess critical thinking abilities of students before and after the intervention of PBL in the classroom. No physical or emotional harm is anticipated.

Possible advantages of participation:

This research may not directly benefit you but aims to enhance educational practices for students like you by improving the implementation of PBL and fostering critical thinking skills.

Confidentiality & Privacy. Any information obtained for this study through which you might be identified will remain confidential and will be disclosed only with your permission. Your answers will be anonymized in the reporting of the results. Raw data will be maintained in a secure location and no identifying information will be used in the final dissertation or subsequent publications. No one, other than my supervisor, will have access to the raw data. All audio recordings, video recordings, and other documents, with the exception of the consent forms, will not be shared with any third party at the conclusion of this study.

Contacts for additional information: researcher Laura Lyadova, +77057051732, laura.lyadova@sdu.edu.kz.

Voluntary Nature of the Study. It is strictly voluntary as to whether to participate in this study or not. You have a right to withdraw your agreement to participate at any time.

Estimated duration of the research: 10-15 weeks (one academic semester)**.**

Statement of Consent.

I, _____, agree to participate in this study voluntarily. I have been made aware of the research purpose and objectives and clearly understand what is expected from me.

I know that it is voluntary to participate in this study and I have complete freedom to withdraw my consent at any time without providing any reasons and in this case there will be no negative consequences to me.

I understand that any personal information obtained in this study will be kept confidential.

Signature: _____ Date: _____

Researcher:

Signature: _____ Date:_____

Appendix C

Interview Questions

Pre-PBL Intervention Questions:

1.Understanding of Critical Thinking:

- Can you describe what 'critical thinking' means to you?
- How do you assess your current critical thinking skills?

2. Previous Learning Experiences:

- What types of learning activities have you found most effective in developing your critical thinking skills?
- Can you provide an example of a classroom activity that challenged you to think critically?

3.Expectations of PBL:

- What do you know about Project-Based Learning?
- How do you think engaging in PBL might influence your learning and critical thinking abilities?

Post-PBL Intervention Questions:

1.Experience with PBL:

- Can you describe your experience participating in the recent PBL activities?
- What aspects of PBL did you find most engaging or challenging?

2. Impact on Critical Thinking:

- Do you feel that the PBL activities have enhanced your critical thinking skills? If so, how?

- Can you provide specific examples where PBL helped you analyze or solve problems more effectively?

3. Comparison to Previous Learning Methods:
    - How does PBL compare to other learning methods you've experienced in terms of fostering critical thinking?
    - Which aspects of PBL do you believe contributed most to your learning and critical thinking development?
4. Feedback and Suggestions:
    - What improvements or changes would you suggest for future PBL activities?
    - Do you think PBL should be integrated more into your curriculum? Why or why not?