Project-based Learning via Blackboard Discussion Board for Vocabulary Acquisition of Saudi EFL Learners

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Abstract

The global pandemic of COVID-19 affected all learning systems worldwide. It shifted the attention to alternative online learning platforms, including discussion boards, blogs, and other tools that necessitate collaborative teamwork. The current research employed project-based learning (PBL) via the blackboard discussion board to improve vocabulary acquisition for Saudi EFL learners and to determine the advantages and difficulties associated with learning. The researchers used a quantitative research design with equivalent groups of 60 female students from King Khalid University divided into two study groups: 30 for the experimental group taught through project-based learning via discussion board and 30 for the control group taught traditionally. Pre- and post-vocabulary tests were administered to the two groups, and a questionnaire of four dimensions about the advantages, skills, effects, and challenges encountered by students through learning were post-administered to the experimental group. Results proved that project-based learning employed through the discussion board enhanced students' receptive and productive vocabulary knowledge. The questionnaire analysis revealed that the PBL increased teamwork skills and responsibility. It motivated students' problem-solving skills and autonomous learning. Despite these merits, there were some challenges, such as the instability of the internet connection, lack of time, and some students' hesitation to deliver presentations.

Keywords: discussion board, project-based learning, Saudi EFL learners, vocabulary acquisition

1. Introduction

The COVID-19 epidemic tremendously changed the educational system worldwide, necessitating employing online learning techniques. According to Mohamed and Alian (2023), technology-assisted language learning can improve students' proficiency in a virtual setting, lowering tension and fostering tranquility, allowing for free practice and learning. As a result, numerous technological solutions are available to promote learning in the digital age. However, Ayebi-Arthur (2017) indicated that learning via online platforms required a solid technological basis. Online forums, blogs, discussion boards, and mobile technology are the only digital tools that make learning possible while on the learning journey.

A range of teaching strategies are supported by constructivism theory. One educational and learning model that arises is project-based learning (Praba, Artini & Ramendra, 2018). In English as a Foreign Language (EFL), the project-based approach promotes active student participation in real-world projects, fostering the development of language abilities through practical activities and group learning. In addition, according to Bekiryazici (2015), to increase students' language fluency, PBL heavily emphasizes collaborative learning, promoting debate and involvement among students. Project-based learning has benefits and drawbacks for both students and teachers. According to Syarifah and Emiliasari (2019), Project-based learning helps students strengthen their writing skills and creativity. After applying project-based learning, students' grasp of the narrative genre's theme, purpose, structures, and linguistic elements improves. Firstly, PBL effectively enhances critical thinking skills among EFL learners by exposing them to real-world challenges and collaborative learning environments (Song, Razali, Sulaiman & Jeyaraj, 2024). This method enhances critical higher-order thinking skills like analysis, invention, and assessment, which are crucial for academic and professional fields and language acquisition. Secondly, because it considers the students' skills, knowledge, and attitudes, PBL offers chances to create a fun learning environment in the classroom. (Praba et al., 2018). Thirdly, Simpson (2011) demonstrated how PBL improves academic performance and content knowledge pertinent to the course and develops thinking skills, motivation, and autonomy in learning. These are crucial life skills that students can acquire through PBL. Finally, Syarifah and Emiliasari (2019) concluded that Project-Based Learning (PBL) enhances students' language proficiency while fostering innovative and analytical abilities.

Due to its ability to replicate a traditional classroom environment, Saudi Arabian universities use Blackboard as an online learning

platform. A feature of Blackboard allows students and instructors to communicate online through discussion boards. Discussion boards let users post questions and comments and communicate asynchronously (Li & Liu, 2018). Some scholars, such as Astawa, Artini, and Nitiasih (2017) and Tuyen and Tien (2021), reported that students who struggle to speak up in class can still participate and have their voices heard in online discussions. Additionally, students can learn independently and cooperatively through an online learning forum, particularly when interacting with teachers and other students (Obiakor, Harris, Mutua, Rotatori & Algozzine, 2012; Seethamraju, 2014). Comparable features can be found in the Blackboard Discussion Board tool, which includes group contributions, folders with messages, and threads with replies to topics. Posts can be edited, reposted, and rated, and who can post is controlled by different settings. Both tools make an interactive and collaborative experience possible (Li & Liu, 2018).

Students are using digital technologies and World Websites more and more in the twenty-first century to improve their English language proficiency. It is essential to use digital teaching strategies and motivate students to practice their language skills to close the gap between their academic and personal lives (Baniabdelrahman, 2013). One of the most critical components of learning a language is developing one's vocabulary, particularly for those studying English as a second or foreign language (ESL/EFL), as it facilitates the acquisition of basic language skills. Blachowicz and Fisher (2005) stated that vocabulary development helps students read fluently and communicate more effectively. It also enables them to engage in social and academic activities and comprehend the world around them. Thus, learning vocabulary can be challenging if students are not given the tools to apply this vocabulary and create a network of related vocabulary. Project-based learning techniques allow students to learn inductively through project-based learning and group projects (Salazar & Carballo, 2010).

2. Literature Review

Through student-centered, teacher-facilitated learning, project-based learning promotes intellectual and social growth by allowing students to actively learn new material and skills with minimal teacher guidance (Yamin, Halim & Muhayyang, 2023). Therefore, project-based learning is anticipated to increase student participation in the classroom and offer chances for English language practice. Project-based learning (PBL) is an approach to education that centers on activities meant to create learning outcomes through project work (Praba et al., 2018). Furthermore, it is described as a learning approach focused on the student's needs and involves them working together to complete a series of real-world tasks and create a final project (Mills, 2009). Moreover, Vaca Torres and Gómez Rodríguez (2017) defined it as a constructivist educational strategy that uses group work and social interaction to teach students problem-solving skills. Moreover, it can be described as a student-centered approach to instruction that occurs over an extended period and focuses on selecting, planning, investigating, and presenting a product, presentation, or performance that answers a real-world problem or responds to authentic challenges (Holm, 2011).

PBL has various benefits for students' learning skills as it enables them to discover new experiences through collaboratively searching for information. Numerous studies have shown that PBL significantly improves language proficiency. Sirisrimangkorn (2018) found that project-based learning is an effective teaching method that allows students to speak English and is a fun approach to learning a foreign language. Alotaibi (2020) conducted a study involving 59 students in a secondary school's third grade. The results indicate that the participants' persuasive writing performance significantly improved upon implementing the explicit project-based learning model. In 2020, Sahib Tamimi and Abed Salamin conducted a mixed-methods research study, gathering qualitative and quantitative data from two classes of sixty-nine ninth graders. The study concluded that PBL might be a valuable technique for teaching English to speakers of other languages. Moreover, a study by Kettanun (2015) showed that the project-based EFL classroom helped the students develop their interpersonal, work ethics, and cognitive abilities and provided good learning outcomes. Several investigations concluded that PBL programs are often successful in nearly every domain (Kimsesiz, Dolgunsöz, & Konca, 2017; Baş & Beyhan, 2010; Shaalan, 2020; Farouck, 2016).

The core idea behind PBL is that students get more interested in real-world problems and deliberate thought processes as they solve them and learn new material. PjBL provides students many benefits, such as opportunities to develop their self-esteem, confidence, autonomy, cooperative skills, motivation, problem-solving skills, and language competence (Sabet & Ravand, 2017; Fragoulis & Tsiplakides, 2009). PBL has a series of phases that teachers need to consider throughout implementation. Alotaibi (2020) created a six-phase PBL model based on various studies. These phases include motivation, modeling, planning, implementation, assessment, and public product. Teachers use visual aids in the motivation and modeling stages to engage students' prior knowledge and spark curiosity while demonstrating persuasive essays for understanding. During the planning phase, students discussed project topics and deadlines, developed individually or in groups, and selected a central question. They engaged in persuasive writing challenges and implemented their projects. In the assessment stage, the teacher conducted authentic assessments using performance-based methods and student artifacts, providing continuous feedback and promoting peer and self-evaluation. The researcher created a rubric for persuasive essay evaluation. During the last phase, Public Product, students demonstrated their persuasive essay writing skills by creating a product for the class and the public.

Farouck (2016) developed another PBL model consisting of seven stages. First, design the PBLL curriculum. Second, describe the project tasks and prepare students. Third, the selection of driving questions. Fourth, give students the required tools. Fifth, building knowledge, understanding, and presentation skills to address the driving question. Sixth, develop and revise presentations. Seventh, present the final products or findings to the driving question. Moreover, as stated by Stoller (2002), Project-Based Learning (PBL) involves several teaching steps, such as selecting a project theme, deciding on an outcome, organizing the work, preparing students for information gathering, gathering and analyzing data, preparing them for language demands, presenting the work, and assessing the project.

Concerns about incorporating technology into education have also been raised by several educational institutions, especially during the COVID-19 period. According to Devkota et al. (2017), PBL combined with technology is preferable to traditional teaching methods since it helps students become better global citizens who can use technological resources to advance their knowledge and capabilities acquisition. One of the well-known online learning tools is the discussion board utilized in Saudi Arabian colleges to stimulate students' collaboration and engagement in learning. Some recent studies examined the impact of discussion boards on improving language skills. The study by Li and Liu (2018) explores students' perceptions of reading and writing practice on Discussion Boards. Discussion boards provide more writing opportunities than traditional classrooms, enabling more frequent and effective writing. The study also found that peer reviews and reflections on Discussion Boards motivate students to write more thoughtfully and foster a learning community.

In another study by Hakim (2020), Eighty EFL teachers from the English Language Institute at KAU were polled and interviewed regarding their opinions and experiences with using the Blackboard. The results show that Blackboard is an organized online learning environment that facilitates better teacher-student interactions and increases the effectiveness of English instruction. Moreover, the study conducted by Al-Oqaily, Salam, and Na (2022) discovered that the students' favorable impressions of online learning were influenced by their prior experience with Blackboard. It also aided in the online instruction of English language proficiency. The findings of the Ta'amneh (2020) study show that Blackboard learning was successful in helping the experimental group's writing abilities grow and improve and fostering a favorable attitude toward Blackboard learning. A study by Ali (2017) claims that employing Blackboard encourages diligence and offers a more successful learning strategy than conventional techniques. Students saw Blackboard as a motivating factor.

On the other hand, studies proved the difficulties of online education; 25 English language majors were polled for Al-Nofaie's (2020) study, which assessed the advantages and disadvantages of online education. According to the study, although students did not find virtual education as intriguing as other studies believed, they did appreciate the flexibility of asynchronous environments over synchronous ones. In the same way, Alamer's (2020) study examined student understanding and proficiency with the Blackboard during classroom instruction. Results discovered that 34 KKU students had unfavorable attitudes due to their inability to acquire English vocabulary. The study found that Blackboard did not significantly affect students' attitudes or performance in vocabulary acquisition. It also outlined the drawbacks of blended learning and offered a plan of action for developing possibilities for university students to learn in a supportive environment.

Considering vocabulary's significance in learning a foreign language, Santi, Kholipa, Putri, and Mujiono (2021) stated that learning vocabulary in English is essential for enhancing other language skills, including writing, speaking, listening, and reading, highlighting vocabulary's significance in learning a foreign language. Susanto (2017) provided evidence supporting this claim, pointing out that vocabulary skills are sometimes essential to learning a foreign language because a restricted vocabulary in a second language hinders efficient communication. In addition, building a substantial vocabulary is essential for the proficient use of a foreign language, as stated by Alqahtani (2015), since a language learner with little vocabulary will not be able to apply the structures and functions they have learned for clear communication. In other words, a meaningful discourse is built on its vocabulary. Most of the time, vocabulary is taught incorrectly by exposing students to words outside real-world contexts. Similarly, numerous studies have shown the value of vocabulary in learning a second language, such as that of (Susanto, 2017; Alqahtani, 2015; Afzal, 2019; Mart, 2012;   Anjaniputra & Salsabila, 2018).

Al-Dagel (2009) classifies vocabulary into two categories: productive and receptive. Productive vocabulary is the words students may develop and use to describe their ideas vocally or in writing. On the other hand, receptive vocabulary refers to the terminology children perceive when listening to or reading material. To enhance receptive and productive vocabulary in a Turkish high school, a study by Kırmızı and Kömeç (2019) implemented a flipped classroom approach. According to the research, flipped learning participants outperformed traditional instruction participants on receptive and productive vocabulary knowledge assessments. Pinot-Shahov (2012) researched to differentiate between productive and receptive vocabulary knowledge. She gave an example of productive knowledge: the capacity to employ a term in a speech or written piece appropriately. In contrast, receptive knowledge is the capacity to comprehend a phrase in both spoken and written form. According to the study, students pick up receptive vocabulary before productive vocabulary. Additionally, it is better to teach a phrase productively than to learn it in a productive one; this also holds for receptive knowledge.

Regarding project-based learning for teaching vocabulary, some studies concluded that to overcome the challenges related to traditional lecture-based education, project-based learning (PBL) is a well-liked teaching strategy that attempts to increase students' vocabulary and communication skills by enabling them to work in groups and apply their knowledge on their own, as well as demonstrating increased difficulty level retention of new vocabulary (Shafaei, Poorverdi & Parvizi, 2007; Shafaei & Abdul Rahim, 2015). Furthermore, research by Kimsesiz et al. (2017) and Sari (2019) found that, in comparison to conventional techniques, the PBL approach was more effective in enhancing EFL vocabulary learning gains. In the same way, Palashi, Haddad Narafshan, and Anjomshoa (2023) investigate the use of technology in project-based learning (PBL) to help students expand their vocabularies and establish their social identities. It emphasizes the advantages of integrating technology into school health and its influence on academic progress and identity formation.

The current research is trying to answer the following main questions:

Are there significant differences between the experimental group (taught through the project-based learning approach through the blackboard discussion board) and the control group (taught through conventional mode) in their overall vocabulary acquisition?

This question is divided into the following sub-questions:

1. Are there significant differences between the experimental group (taught through the project-based learning approach through the blackboard discussion board) and the control group (taught through traditional mode) in receptive vocabulary acquisition?

2. Are there significant differences between the experimental group (taught through the project-based learning approach through the blackboard discussion board) and the control group (taught through traditional mode) in their productive vocabulary acquisition?

The second main question that the current research is trying to answer is:

How do students perceive using Project-Based Learning via the Blackboard discussion board to enhance their vocabulary acquisition?

The previous question is divided into the coming sub-questions:

1. What are the students' perceptions of the advantages of using Project-Based Learning via a Blackboard discussion board to enhance their vocabulary acquisition?

2. What are the students' perceptions of using Project-Based Learning via a Blackboard discussion board to enhance their vocabulary acquisition?

3. What are the students' perceptions toward the challenges of using Project-Based Learning via a Blackboard discussion board to enhance their vocabulary acquisition?

3. Methodology

3.1 Design

The current study employed an equivalent group design, a quasi-experiment one. Randomly, the two classes were divided into an experimental and a control group. The experimental group received project-based learning instruction through Blackboard to develop their receptive and productive vocabulary acquisition, while the control group members received traditional instruction. Both groups underwent pre- and post-writing tests before and after the treatment. An exploratory questionnaire was conducted to investigate the experimental group students' perceptions of the advantages, effects, and challenges encountered using Project-Based Learning via the Blackboard discussion board to expand their vocabulary knowledge.

3.2 Participants

Sixty female students from King Khalid University in Saudi Arabia, in their second year (level three), were randomly selected to participate in the study for three months during the academic year 2020/2021. Thirty students were randomly assigned to the experimental group and the other thirty to the control group. According to their random selection, the subjects form a homogeneous group, equivalent in age, education, and vocabulary knowledge. Therefore, their degrees of experience would be comparable, and they would have a lot in common. An independent samples t-test was used to determine whether any statistically significant differences existed between the mean scores of the experimental and the control group. As shown in Table 1, both groups performed equally well in pre-applicating the receptive and productive vocabulary tasks.

Table 1. T-value of the experimental and control groups on the application of the pre-vocabulary test

Tasks	Group	N	Mean	Std. Deviation	df	T	P
Receptive	Control	30	5.10	1.44	58	.263	.793
	Experimental	30	5.20	1.49			
Productive	Control	30	4.70	1.17	58	.544	.589
	Experimental	30	4.86	1.19			
Total	Control	30	9.80	2.02	58	.558	.579
	Experimental	30	10.06	1.65			

According to the data in Table 1, there are no statistically significant differences between the experimental group (project-based learning through a blackboard discussion board) and the control group (conventional vocabulary instruction) (p>.05).

3.3 Research Procedures

During 32 sessions, most of the chapters of the English Vocabulary in use for the intermediate-level book were taught. Each session covered two chapters and took 60 minutes. The program began in September 2020 and ended in the last week of November 2020. Implementing the BPL utilizing the blackboard discussion board required several phases through which students were engaged in various exploring activities and practices. The researchers designed a PBL model consisting of six phases (Figure 1) that students went through to achieve their final project, as shown below:
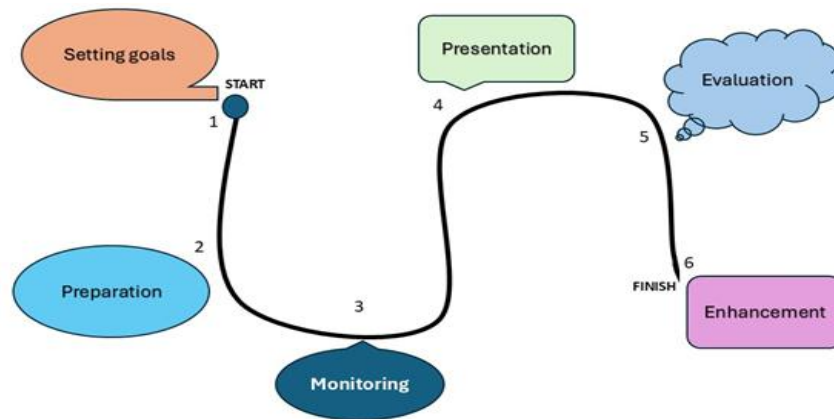
Figure 1. Project-based Learning Model

3.3.1 Phase One: Setting Goals

After informing students that they would deliver a group presentation on selected topics from their book, such as fashion and clothes, shopping, studying English, cooking, friends, and books, students were motivated to pose their broad and specific goals for achieving the project. They also assigned their roles and how they would cooperate by defining each one's role in the group. Students were divided into six groups, each consisting of five students.

3.3.2 Phase Two: Preparation

Students started creating the driving questions to urge their group to respond in the forum by sharing their different viewpoints, reactions, and interactions about the proposed topic; they also defined the various resources for combining their final presentation, whether from the internet, books, colleagues, family, or friends. Students started practicing activities inside and outside the classroom. They used discussion board forums by posting questions such as "What are the advantages and disadvantages of online shopping?" creating forums discussing synonyms, antonyms, collocations, and word family and using new words in meaningful contexts related to the given topics. In addition, they learned presentation skills, how to organize their content, and how to deliver it using different tones, volume, intonation, and correct pronunciation.

3.3.3 Phase Three: Monitoring

The teacher checked whether the language used in the discussion or answering questions was grammatically correct, ensuring a wide variety of the proposed vocabulary and that the given topic was covered entirely in the discussion. If students struggled in posing questions or giving responses, the teacher tried to guide them and advise them on modifying their responses. Opportunities are also given for self and peer assessment for better improvement.

3.3.4 Phase Four: Presentation

Students delivered their presentations in groups with the help of different resources, whether inside or outside the classroom. They used inside-classroom activities such as discussing their questions and responses, expanding their vocabulary knowledge, giving synonyms, antonyms, and word families like adjectives, nouns, and adverbs, and using them in meaningful contexts. They practically implemented the presentation skills they had learned in these sessions outside classroom activities such as surfing the internet, looking up dictionaries, searching books, and discussing with colleagues, family, or friends.

3.3.5 Phase Five: Evaluation

The teacher here graded the evaluation checklist, which noted what needed improvement and what was perfect in student presentations. The checklist included achieving the main goal by covering the whole topic in an organized manner, using a wide range of vocabulary, using a varied tone, showing interest, having clear pronunciation, and having self-confidence.

3.3.6 Phase Six: Enhancement

During this phase, the teacher provided constructive feedback to the students, guiding them on whether they had met the presentation goals. Taking an active role in their learning, the students then revisited their presentations, identifying and addressing any weaknesses to enhance their skills.

3.4 Instruments

The researchers constructed and administered a pre-test and a post-test of vocabulary to the experimental and control groups. Students in both groups were pre-tested to ensure they were on the same level before the experiment. Then, the post-test was administered to determine whether the project-based learning implemented through the blackboard discussion board effectively developed students' receptive and productive vocabulary knowledge. The two tests consisted of two parts. The first part measured receptive vocabulary

knowledge through a fill-in-gap question. The other part gauged the learned productive vocabulary through writing a ten-sentence paragraph (Appendices A and B). The two tests were sent to five TEFL Professors and associate professors for reviewing and proposing any modifications needed. They approved the tests, and a few changes were made. To test reliability, the researcher used Cronbach's Alpha with SPSS software (table 2).

Table 2. The Reliability of the pre-test and the post-test using Cronbach's Alpha

Reliability scale	Number of items	Value
Cronbach's Alpha	11 Items (the pre-test)	0.889
	11 Items (the post-test)	0.894

A five-Likert-scale questionnaire for measuring students' perceptions towards the use of project-based learning via a discussion board for expanding their vocabulary knowledge was also prepared by the researchers and post-administered to the experimental group. It consisted of twenty items, divided into four main categories: advantages, teamwork skills, PBL effect on vocabulary acquisition, and challenges. The questionnaire was also given to the same jury to check its face validity and to suggest any required amendments. They checked it with a few refinements, which were considered. Cronbach's Alpha was also used to test the questionnaire's reliability (table 3).

Table 3. The Reliability of the questionnaire using Cronbach's Alpha

Reliability scale	Number of items	Value
Cronbach's Alpha	20 Items	0.98*3*

4. Results

Pretest and post-test data were analyzed using SPSS (Statistical Package for Social Sciences, version. 24) through the independent samples t-test formula, as shown in Table 4 of the post-test scores.

Table 4. T-value of the experimental and control groups on the application of the post-vocabulary test

Tasks	Group	N	Mean	Std. Deviation	df	T	P
Receptive	Control	30	6.43	1.27	58	4.92	.000
	Experimental	30	7.96	1.12			
Productive	Control	30	5.96	0.76	58	4.36	.000
	Experimental	30	7.03	1.09			
Total	Control	30	12.40	1.42	58	6.59	.000
	Experimental	30	15.00	1.61			

Concerning the first research question about the statistically significant differences between the experimental and the control group, the results above showed that the experimental study group had a statistically significant difference from the control group regarding students' overall vocabulary acquisition at level ($p< 0.01$). There was a clear difference in mean scores between the experimental and control groups (15.00 versus 12.40), which was a practical benefit of implementing the project-based approach through the blackboard discussion board.

Regarding the first research sub-question on the statistically significant differences between the experimental and the control group in their receptive vocabulary acquisition, results proved that the experimental group significantly outperformed the control group ($p< 0.01$), as it is evident in their mean scores (7.96 versus 6.43).

As for the second research sub-question concerning the statistically significant differences between the experimental and the control group in their productive vocabulary acquisition, the results above indicated that the experimental group significantly exceeded the control group ($p< 0.01$), as their mean scores (7.03 versus 5.96) indicated the difference.

Table 5 statistically analyzes the students' perceptions of the effects, advantages, and challenges encountered when using Project-Based Learning via Blackboard discussion board to expand their vocabulary knowledge. This table shows the mean score of each item, its rank within each category, and the mean score of each category, providing a valuable qualitative perspective on the research findings.

Table 5. Students' perceptions of the advantages, effects, and challenges of using PBL via Blackboard discussion board to expand their vocabulary knowledge.

Statements		SA 5	A 4	U 3	D 2	SD 1	Mean	St. Deviation	Rank
1. PBL via discussion board provided an enjoyable and enthusiastic approach to study English.	F	5	17	3	3	2	3.66	1.093	2
	%	16.7%	56.7%	10%	10%	6.7%			
2. It helped me master numerous areas of my English language classes.	F	4	15	5	4	2	3.50	1.106	3
	%	13.3%	50%	16.7%	13.3%	6.7%			
3. It inspired me to engage in activities.	F	7	18	3	1	1	3.96	.889	1
	%	23.3%	60%	10%	3.3%	3.3%			
4. It helped build practical problem-solving skills.	F	3	14	5	4	4	3.26	1.22	5
	%	10%	46.7%	16.7%	13.3%	13.3%			
5. It motivated me to increase my self-directed learning skills.	F	4	12	4	5	5	3.16	1.34	6
	%	13.3%	40%	13.3%	16.7%	16.7%			
6. It helped me to feel more responsible and confident	F	4	14	3	5	4	3.30	3.30	4

while working on the project.	%	13.3%	46.7%	10%	16.7%	13.3%			
Advantages of employing PBL via Discussion Board							3.47		
7. It facilitated opinion sharing.	F	7	13	5	2	3	3.63	3.63	3
	%	23.3%	43.3%	16.7%	6.7%	10%			
8. It promoted purposeful communication with my colleagues.	F	6	16	4	2	2	3.73	3.73	1
	%	20%	53.3%	13.3%	6.7%	6.7%			
9. It allowed for interaction with peers inside and outside the classroom.	F	5	12	6	4	3	3.40	3.40	4
	%	16.7%	40%	20%	13.3%	10%			
10. It enhances cooperation and teamwork skills.	F	7	14	4	2	3	3.66	3.66	2
	%	23.3%	46.7%	13.3%	6.7%	10%			
Teamwork Skills of PBL via Discussion Board							3.60		
11. It helped me to acquire new vocabulary.	F	7	15	4	2	2	3.76	1.10	2
	%	23.3%	50%	13.3%	6.7%	6.7%			
12. It allowed me to learn vocabulary from peers and other sources.	F	6	14	5	3	2	3.63	1.12	3
	%	20%	46.7%	16.7%	10%	6.7%			
13. It helped me to apply learned vocabulary in new contexts.	F	4	13	6	4	3	3.36	1.18	4
	%	13.3%	43.3%	20%	13.3%	10%			
14. It enhanced my vocabulary recall and retention.	F	3	13	5	5	4	3.20	1.24	5
	%	10%	43.3%	16.7%	16.7%	13.3%			
15. It gave me an opportunity to receive feedback on my participation and presentation.	F	8	17	3	2	0	4.03	.808	1
	%	26.7%	56.7%	10%	6.7%	0%			
The Effect of PBL via Discussion Board on Vocabulary Acquisition							3.59		
16. I did not have much time to chat and participate.	F	5	12	4	5	4	3.30	1.31	2
	%	16.7%	40%	13.3%	16.7%	13.3%			
17. Sometimes, the internet was not available.	F	7	13	4	3	3	3.60	1.24	1
	%	23.3%	43.3%	13.3%	10%	10%			
18- I faced technical problems while using the discussion board.	F	2	5	3	16	4	2.50	1.13	4
	%	6.7%	16.7%	10%	53.3%	13.3%			
19- The project type was too complex to carry out.	F	2	3	5	15	5	2.40	1.10	5
	%	6.7%	10%	16.7%	50%	16.7%			
20. I feel shy to deliver a presentation.	F	6	7	5	7	5	3.06	1.41	3
	%	16.7%	23.3%	16.7%	23.3%	16.7%			
Challenges of using PBl via Discussion Board							2.97		

In response to the first sub-question of the second main one concerning the advantages of using Project-Based Learning via Blackboard discussion board for enhancing students' vocabulary acquisition, most students agreed that it inspired them to engage in activities. It provided an enjoyable and enthusiastic approach to studying English and helped them master numerous areas of their English language classes. These aspects received the highest mean scores (3.96,3.66, and 3.50). Utilizing the PBL also empowered them to feel more responsible and confident while working on the project. Moreover, it helped them build practical problem-solving skills. In addition, it motivated them to increase their self-directed learning skills, with a mean score of 3.30, 3.26, and 3.16. In terms of teamwork skills, many students agreed that it promoted purposeful communication, enhanced cooperation and teamwork skills, and facilitated opinion sharing, both within and outside the classroom. These aspects received mean scores of 3.66, 3.63, and 3.40, respectively.

Concerning the second sub-question of the second main one about the effect of using Project-Based Learning via Blackboard discussion board for enhancing Saudi students' vocabulary acquisition, they declared that the highest two benefits were giving them opportunities to receive feedback on their presentations and helping them to acquire new vocabulary (4.03 and 3.76), managing to learn vocabulary from their peers and other sources came in the third place. In addition, it helped them to use the learned vocabulary in new contexts (3.63), and in the fourth rank, it enhanced their vocabulary recall and retention.

Regarding the challenges encountered by students through using PBL via discussion board to enhance their vocabulary acquisition, the first two main issues were the unavailability of the internet and not having enough time to chat and participate (M=3.60 and 3.30). In third place, some students feel shy about delivering their presentations (M=3.06). At the same time, other issues, such as the difficulty of the project tasks or technical problems while using the discussion board, were not considered significant issues as they received the lowest mean scores (M=2.50 and 2.40).

5. Discussion

Results in the previous section revealed that students' receptive and productive vocabulary had improved due to achieving their tasks in the project and being involved in giving their responses, reactions, and interactions in the Blackboard discussion board, as PBL encouraged

them to participate actively in learning. Posing different questions and seeking answers broadened their knowledge and expanded their vocabulary repertoire. Utilizing new words in meaningful contexts, primarily through tackling real-life and authentic topics, motivated them for cooperative and teamwork learning through which they gained new vocabulary, knowledge, and experiences. This result is echoed in other research results (Shafaei & Abdul Rahim, 2015; Sari, 2019), emphasizing that PBL enhanced learners' vocabulary mastery, recall, and retention even with higher-level difficulty words, mainly through the PBL authentic learning environment. Alian's (2024) study proved that learning through interactive contexts helps boost vocabulary acquisition.

The discussion board also played an influential role in increasing students' vocabulary knowledge. It is a safe place for shy students who do not like to share their voices orally and prefer to participate in a written way. Students in each group were not required to respond immediately to the posed questions and discussions. They took their time to prepare, check, revise, and refine their answers well, encouraging them to learn independently. Alharbi's (2015) study found a similar result, proving that students learn new vocabulary faster when teachers use electronic tools such as discussion boards. Al Zumor, Al Refaai, Eddin, and Al-Rahman's (2013) study also asserted that students' vocabulary was enriched when integrating blackboard tools such as discussion boards with face-to-face learning.

Students were mainly responsible for their learning, with slight direction and guidance from the teacher. They learned by asking questions, discussing, responding, analyzing, reacting, and interacting. How they posed their goals and accurately planned for achieving and distributing tasks increased their autonomy, motivation, cooperation, and self-directed learning in vocabulary acquisition. This result is consistent with Puangpunsi's (2021) study, which pinpointed the role of PBL in encouraging learners' collaboration and teamwork skills in encouraging English skills performance and 21st-century skills.

The authentic topics given for discussion, such as fashion and clothes, shopping, travel, daily routines, and other real-life topics, stirred students' interest in sharing, and they responded actively to the discussion board and enthusiastically achieved their roles in the project. They cooperated in writing meaningful sentences and gathering information for their presentations. Furthermore, students tried to contact the outside society. They interacted with their friends and families and other sources to gain knowledge about the updated information related to their topics. The PBL encouraged teamwork, cooperation, and competitive spirit among the teams and motivated them to exert their best for their presentations.

The questionnaire analysis proved that the first and second categories of the advantages of employing the PBL via blackboard discussion board received positive student attitudes. Most students viewed PBL via the discussion board as an empowering and stimulating tool that involved them in activities, provided an exciting and dynamic learning environment, enhanced their language proficiency, increased their sense of responsibility, developed their problem-solving skills, boosted their self-directed learning skills, improved cooperation, teamwork skills, interaction and communication inside and outside the classroom. This research result is consistent with a study by Astawa et al. (2017), which demonstrated that PBL improved enthusiasm, confidence, creativity, self-directed learning, and collaborative learning skills. Additionally, Tuyen and Tien (2021) clarified that PBL can help students develop workplace skills like communication, problem-solving, teamwork, and interpersonal communication.

The third category of the questionnaire analysis concerning the effects of using PBL via Blackboard discussion board on vocabulary acquisition showed that the received washback followed students' presentations enriched their vocabulary knowledge and cultivated other presentation skills, such as covering the entire topic well-structured and coherently. Presentation skills involved using a wide range of vocabulary, varying tones, showing interest in engaging others and attracting their attention, pronouncing words and phrases clearly, and exuding self-confidence throughout the presentation, especially in an online environment. The use of PBL significantly facilitated the acquisition of new vocabulary, enabled students to learn from peers and other sources, helped them to apply learned vocabulary in new contexts, and strengthened vocabulary recall and retention. This result is aligned with other studies results as Shafaei and Abdul Rahim (2015), Sari (2019), Tuyen and Tien (2021), Syukri, Marhalisa, Halim, Atikah, and Abidin (2022) who clarified that PBL increased students' skills, especially in vocabulary. It enhanced their vocabulary recall and retention, even for the words with a higher difficulty level and helped students learn new words and phrases.

As for the main challenges encountered by students through employing PBL via the blackboard discussion board, students revealed that sometimes the internet was not available, and this may be due to their faraway places or the weather conditions like rains or the heavy load of internet usage during the pandemic. They also clarified that they did not have enough time to chat and participate in the group owing to their engagement with various assignments, quizzes, and mid-exams of other courses. AlRasheed and Alghamdi's (2023) study identified similar issues related to students' difficulty finding time to achieve their project tasks. They struggled to manage their time in studying and completing their project simultaneously. Another challenge students faced was their ability and readiness to deliver their presentations. Some expressed feeling shy and hesitant to present and explain their work. Concerning the complexity of the project and the technical issues faced while using the discussion board, students found the project tasks manageable. They did not face problems in dealing with the discussion board.

6. Conclusion

Employing project-based learning via the Blackboard discussion board improved the vocabulary knowledge of Saudi EFL learners during the pandemic. PBL and discussion board have various positive points, encouraging inactive and shy learners to voice their opinions and share within the group. Self-directed learning with slight guidance and support from the teacher stirred students for further learning possibilities, which were not restricted only to the synchronous learning environment but also to the asynchronous and outer learning

environments.

The PBL tasks and delivering presentations motivated teamwork skills, cooperation spirits, and responsibility within the groups. Responding within the groups and collecting the required material for presentations motivated students' problem-solving skills and autonomous learning. The authentic materials and real-life daily topics for discussion encouraged students to be more involved and engaged in their learning. Applying learned vocabulary in new contexts helped expand their vocabulary repertoire.

Despite the positive points of employing the PBL via discussion board for increasing students' vocabulary acquisition, some challenges hindered students' interaction, such as the instability of the internet connection, lack of time for achieving their tasks, and their hesitation to deliver presentations. Other elements that were expected to challenge students' progress in the projects proved to be applicable, and most students did not face problems while dealing with them, such as the technical problems in using the discussion board or the complexity of the project tasks. Students found the project task manageable and did not face problems sending messages or creating threads on the discussion board.

The cooperative mode of the PBL, self-reliance, teamwork spirit, and the given washback stirred students' motivation for learning. The authentic topics encouraged active participation and effective communication through the discussion board. The current research could provide valuable insights into optimizing the role of technology in facilitating PBL to enhance EFL vocabulary knowledge. Further research is required to examine the connection between BPL and other technological tools, such as digital collaboration platforms and language learning apps.

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