



Project-Based Learning Intervention and Its Effect on Promoting English Language Proficiency Based on Moderator Variables: Meta-Analysis

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The previous researchers have studied the effect of Project-based learning on English language proficiency. They found that project-based learning has a positive effect on English language proficiency. However, it is not known whether the impact of project-based learning on English language proficiency significantly differs based on potential moderator variables. The study aimed to conduct a meta-analysis of the findings of experimental studies evaluating the impact of project-based learning on English language proficiency between 2015 and 2021. experimental studies on the effect between project-based learning and English language proficiency are analysed using meta-analysis. The meta-analysis calculated 17 effect sizes of studies. The study found that the random effects model and the effect size were moderate the result. It also revealed that the impact of project-based learning on English language proficiency significantly differs based on the potential moderator variables. The results have pedagogical implications since they suggest that project-based learning is ideal for enhancing the English language proficiency of learners.

Keywords: project-based learning, English language proficiency, meta-analysis, EFL, learning

INTRODUCTION

English teachers have widely used different methodologies to engage students with learning experiences. They have made an effort to encourage students to do learning activities and participate in learning. Therefore, learners have knowledge and understanding during the learning process. As mentioned above, an innovative English learning model and learning strategies are needed to achieve the goal under student characteristics and the subject, namely project model-based learning (PjBL). PjBL is a learning method in which students engage with real-world and hands-on projects where they can apply their knowledge, ideas, and skills during the project completion process.

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PjBL emphasises contextual learning through complex activities by involving students in problem-solving and task-solving activities. PjBL is a learning strategy that provides opportunities for students to practise English in natural contexts (Kholis, M. & Aziz, 2020). And it has been proven to be significantly capable of improving critical thinking skills to solve problems (Almanar, 2019; Hindriyanto; Utaya, S. & Utomo, 2019; Makrufi, A., Hidayat, A. & Muhandjito, 2018; Mali, 2017). PjBL also provides opportunities for students to solve contextual problems through creative (Jalinus, N. & Nabawi, 2017)

The results of previous studies, such as Alotaibi (2020), showed a positive effect of PjBL on the development of persuasive essay writing. Aghayani & Hajmohammadi (2019) also report that PjBL significantly affects EFL learners' writing skills. The PjBL intervention in writing learning can help learners develop the ability to write persuasion (Alotai 2020). This finding is supported by the results of many previous studies such as (Aghayani & Hajmohammadi, 2019; Daz Ramrez, 2014; Kovalyova et al., 2016; Sadeghi et al., 2016). In the context of speaking proficiency, the implementation of PjBL has had a positive influence on improving speaking skills among students (Sayuti et al., 2020; Zare-Behtash & Sarlak, 2017). Applying PjBL in English learning can also improve vocabulary, fluency, pronunciation, organisation, grammar, and content on what to say (Zare-Behtash & Sarlak, 2017). The results of this study also inform that the implementation of PjBL makes students feel that reading, writing, and speaking skills, vocabulary knowledge, and translation skills are improved (Poonpon, 2018). Other findings have also shown that the implementation of PjBL can stimulate students to improve language skills and process information from various sources (Idayu et al., 2019a; Sayuti et al., 2020). Many researchers have previously examined the effect of PjBL on English proficiency. Researchers have previously identified the effect of PjBL use on writing ability (Alotaibi, 2020; Aghayani & Hajmohammadi, 2019; Alotaibi, 2020b; Daz Ramrez, 2014; Kovalyova et al., 2016), (Sadeghi et al., 2016).

Other studies have also reported that PjBL significantly influences speech learning (Sayuti et al., 2020; Zare-Behtash & Sarlak, 2017). Previous findings related to the implementation of PjBL in English language learning significantly influence vocabulary (Poonpon, 2018), improving language skills (Idayu et al., 2019a; Sayuti et al., 2020). The results of this study show that PjBL has a positive influence on English proficiency.

In the context of the level of education, the results of the study by Duman & Yavuz (2018) revealed that PjBL significantly affects student attitudes in English classes. Other studies have also reported that students' speaking ability improved substantially after implementing project-based learning (Sirisrimangkorn, 2018). In line with previous findings, Idayu et al. (2019) revealed a significant improvement in learners' overall oral communicative competence and a high perception of PjBL. Previous findings related to the context of the *developmental* stage revealed that PjBL was able to improve students' speaking skills in a cooperative learning environment. (Sirisrimangkorn 2018). Implementing the implementation of PjBL can increase the vocabulary of English as a foreign language among young learners (Kimsesiz, 2017). In the context of *geographical regions*, research results from Kemaloglu-Er & Sahin (2022) report that

PjBL can influence student progress in a multidimensional way. The results of their research at the rural state school in the Marmara Region of Turkey also revealed that PjBL was also able to increase interest and trust in the proficiency of using English. Implementing PjBL in English language learning influences the increase in motivation and autonomy in learning to listen and speak in Chinese universities. (Yiying 2015). Findings related to the influence of PjBL on *language proficiency indicate that* project-based learners can motivate people to listen and speak college English. Therefore, their English learning capacity and ability to synthesise information increase dramatically (Yiying, 2015).

Many previous studies have revealed the effect of PjBL on English language proficiency; however, research on the influence of PjBL on English language proficiency based on potential moderator variables such as level of education, language goals, geographical regions, and developmental stages has not been widely carried out.

Therefore, it is essential to study the effect of potential moderator variables on the influence between PjBL and English proficiency. This meta-analysis study aims to determine the effect of PjBL on English proficiency based on potential moderator variables. Our meta-analysis examined how PjBL affects English proficiency based on these moderator variables. We offer a systematic review and synthesise the relevant study findings. In particular, our meta-analysis aims to answer the following research questions.

1. To what extent does PjBL affect English language skills?
2. How do potential moderator variables (level of education, level of proficiency, developmental stage, geographical regions, and language proficiency) moderate the effect of PjBL on English language skills?

Literature Review

The Pedagogical Theory Underlying Project-Based Learning

The Theory of Constructivism

The constructivist approach to learning was first derived from the theory of cognitive learning. Constructivism in learning is learning that gives flexibility to students to build their knowledge and give meaning to the information or events experienced (Woolfolk, 2004). Donald et al. (2006) explain that constructivism is a way of teaching and learning to maximise student understanding. They further revealed that learning could be effective if students directly relate to the object being studied in the surrounding environment. Jonassen (1996) posits two things that are the essence of the constructivist view in learning activities, namely: (a) learning is an active process of the building rather than just acquiring knowledge, and (b) learning is a process of supporting the construction of knowledge rather than merely communicating knowledge. Therefore, in the paradigm of the constructivism approach, learning is seen as a process of reconstruction of experiences that takes place continuously (Newby et al., 2000; Ültanır, Emel. 2012)

Cognitive constructivism

The theory of constructivism, in general, is associated with the theory of Jean Piaget, who states that the learner internalises knowledge through accommodation and assimilation. This theory is known as the theory of cognitive constructivism. This theory is based on the idea that knowledge is constructed and made meaningful through the interaction and analysis of the individual toward his environment. This theory also reveals that knowledge is constructed inside the individual's mind through the interaction of the individual with his world. Therefore, this theory focusses on constructing students' new knowledge due to their experiences (Yucel & Habiyakare, 2011). In theory, it is explained that when individuals assimilate, they combine new experiences into existing frameworks without altering those existing frameworks (Yucel & Habiyakare, 2011). This theory of cognitive constructivism also reveals that the individual constructs knowledge through a cognitive process, analysing and interpreting his experiences.

Social constructivism

Social constructivism as a basis for designing a more effective learning environment. Social constructivism in learning is an individual learning process bound by a social context. The process of assimilation and accommodation can only occur with active integration of the learner in the form of practise within society. One of the characteristics of learning from a social constructivist perspective is to actively construct knowledge based on experience and knowledge of the previous physical and social world. Social constructivists see individual subjects and social societies as interconnected. Social constructivists suppress the degree to which students participate in social practises of environmental learning, including collaborative projects, group assignments, and social practises from local communities (Woo & Reeves, 2007). From a social constructivist point of view, learning is seen as a social product produced through the processes of conversation, discussion, and negotiation. Social constructivism views each learner as a unique individual with unique needs and backgrounds.

Learners are also seen to be complex and multidimensional. Social constructivism encourages students to arrive at a version of their truth, influenced by an established background, culture, or worldview. Thus, it recognises the uniqueness and complexity of the learner and encourages, uses, and rewards as an integral part of the learning process (Yucel & Habiyakare, 2011). In the context of project-based learning, the theory of social constructivism forms the basis for innovative learning approaches that can encourage students to participate in collaborative social learning practises. This PjBL (Bell, 2010) sees it as an innovative approach (Idaresit Akpan et al., 2020). This approach is intended for learning that teaches different strategies.

Furthermore (Bell, 2010) revealed that with this PjBL, learners could learn enquiry and work collaboratively to research and complete projects. So, it can reflect their knowledge. Project-based learning is a comprehensive approach to classroom teaching

and learning designed to engage students in the investigation of authentic problems (Blumenfeld et al., 2011; Idaresit Akpan et al., 2020)

Theoretical point of view on project-based learning

Project-based learning (PjBL) is defined as a learning strategy that uses a project or activity as a medium that involves students in transferring knowledge and skills through a discovery process with a series of questions organised in an assignment or project (Kızılkapan & Bektaş 2017; Mahendra, 2017). PjBL is an alternative learning strategy that is considered to be a solution to problems where the university curriculum cannot equip students with the professional skills needed in the business and industrial world when they graduate (Guo et al., 2020). There are four steps to implement PjBL. (1) begins with the formulation of the problem. At this stage, the lecturer can present several learning resources that students may use. (2) project launch, where the lecturer provides a project description, determines the rules, makes an implementation schedule, and draws up work procedures. (3) Project work, which is intended to provide students with the broadest possible opportunity to design and create projects. Students are asked to investigate and present project reports (products) orally and in writing at this stage. (4) In conclusion, students display the final product of the project (Wahyuni, W., Sujoko, S., & Sarosa, 2017).

PjBL has almost the same characteristics as Self-Directed Learning (SDL). SDL is a learning strategy carried out by students to achieve learning success, with or without the help of others, based on personal motivation to master the skill to solve problems in the real world (Mujiono & Herawati, 2021). PjBL is a recommended strategy to be applied in English language learning, such as speaking, because it can facilitate all students to be actively involved in producing products (Nuninsari, D. F., Sutopo, D., & Bharati, 2020). PjBL has not only been proven to be able to improve students' writing skills, but also increases learning motivation to form a comfortable learning atmosphere.

Students are more likely to share jokes, laugh at one another, and talk to their friends in the group when they are working on a project (Argawati, N. O., & Suryani, 2020). The absence of these factors from online education underscores the need to develop a digital project-based learning (DPjBL) model tailored to this mode of education. The DPjBL framework adds a novel idea to the standard PjBL method. As mentioned earlier, several electronic components and pursuits are planned for inclusion in the innovation. For example, students have access to online discussion forums, online project work and monitoring in real time, online forums for displaying product outcomes, and online forums for creating timetables.

METHOD

Research Design

This research was carried out using the meta-analysis method. This method aims to perform a numerical analysis of statistical data from different or similar studies. Cohen (1988) states that meta-analysis aims to combine the findings of the study in a balanced and harmonious manner and turn the findings into a general unit of measurement

(Sugano & Mamolo, 2021). In this study, the researchers used meta-analysis to determine the effect of a project-based learning intervention on promoting English language proficiency. Data were collected by means of the findings of experimental studies evaluating the impact of PjBL on English language proficiency between 2015 and 2021. Each of the characteristics was classified as belonging to one of the five domains addressed in this field: level of education, level of proficiency, developmental stage, geographical regions, and language proficiency. The meta-analysis technique quantitatively synthesises impact studies to clearly show the relationships between variables. Researchers turn the investigative findings collected into a standard unit of measurement called effect size. The meta-analysis determined the effect sizes of 17 studies on various criteria that the original researchers chose.

Data search strategy and study selection

Electronic databases such as SCOPUS, ERIC, EBSCOhost, and ProQuest are used to search for literature. A separate search term was used for PjBL, English achievement, PjBL, or English. We obtained 675 SCOPUS articles, 502 ERIC articles, and 661 ProQuest articles for three months. In addition, as shown in Figure 1, we found 165 articles by EBSCOhost. The publication dates of the research findings were restricted to between 2005 and 2022 since most PjBL studies have been conducted since 2005.

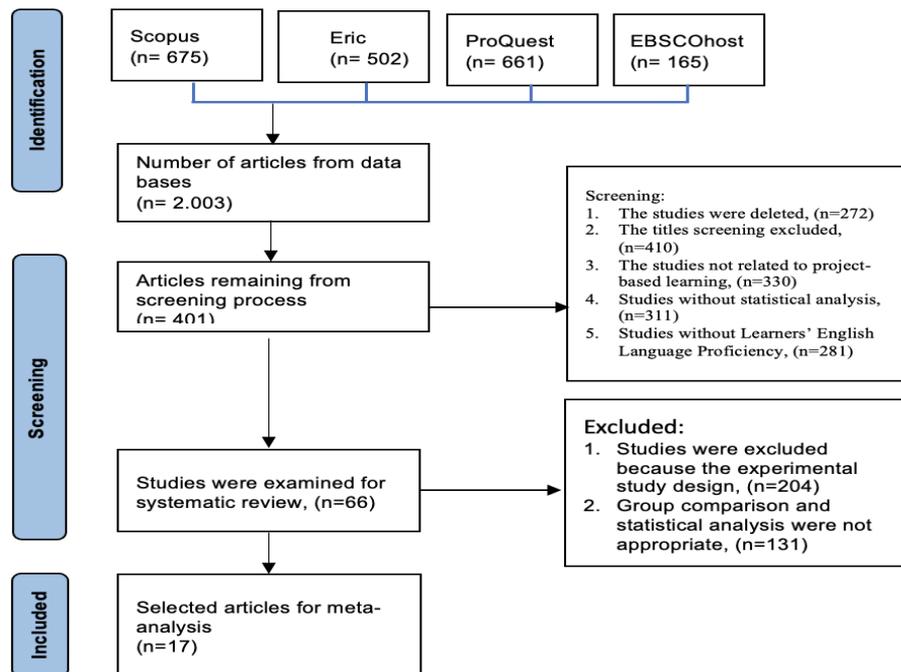


Figure 1
Inclusion and exclusion rules

Inclusion and Exclusion Rules

A search in a database returned 2.003 studies. The first screening led to 401 relevant studies. The chosen studies must meet the criteria, which include having participants with different levels of education, having enough data to figure out the effect size, using an experimental research research method, being done in 2005-2022, and having something to do with PjBL. 66 were kept for more research and coding. Figure 1 shows that the meta-analysis looked at 17 studies.

Table 1
List of selected studies with key characteristics

No.	Authors	N	ES	SE	Level of Education	English Language Proficiency	Leve of English Proficiency	Geographic Region	Developmental stage
1	Aghayani & Hajmohammadi (2019)	28	1.331	0.414	College	Writing	Intermediate	West Asia	Early Adolescence
2	Alotaibi (2020)	59	3.703	0.430	Secondary school	Writing	Pre-Intermediate	West Asia	Late Adolescence
3	Al-Rawahi & Al-Mekhlafi (2015a)	93	0.006	0.207	College	Writing	Pre-Intermediate	West Asia	Adulthood
4	Al-Rawahi & Al-Mekhlafi (2015b)	93	0.065	0.224	College	Reading	Pre-Intermediate	West Asia	Adulthood
5	Bakar, Noordin & Razali (2019a)	50	0.6966	0.28926	College	Speaking	Pre-Intermediate	South East Asia	Adulthood
6	Bakar, Noordin & Razali (2019b)	50	0.2071	0.28139	College	Speaking	Pre-Intermediate	South East Asia	Adulthood
7	Bakar, Noordin & Razali (2019c)	25	0.514	0.307	College	Listening	Pre-Intermediate	South East Asia	Adulthood
8	Carrillo et al. 2019)	57	2.279	0.356	Secondary school	Speaking	Begiiiner	West Asia	Late Adolescence
9	El-Sayed, et al. (2020)	60	1.0528	0.274153	Secondary school	Speaking	Begiiiner	West Asia	Late Adolescence
10	Kavlu (2015)	42	1.533	0.349	College	Reading	Pre-Intermediate	West Asia	Adulthood
11	Sa'diyah & Cahyono (2019)	40	0.149	0.314	College	Writing	Intermediate	South East Asia	Late Adolescence
12	Suhroh., et al. (2020c)	22	0.8294	0.444	Secondary school	Speaking	Pre-Intermediate	South East Asia	Late Adolescence
13	Suhroh et al. (2020a)	50	0.5493	0.286	Secondary school	Speaking	Pre-Intermediate	South East Asia	Late Adolescence
14	Suhroh et al. (2020b)	28	0.1963	0.382	Secondary school	Speaking	Pre-Intermediate	South East Asia	Late Adolescence
15	Syakur, et al. (2020)	65	-1.120	0.266	College	General English	Pre-Advance	South East Asia	Adulthood
16	Wahyudin (2017)	60	0.613	0.263	College	Speaking	Begiiiner	South East Asia	Adulthood
17	Winasih et al. (2019)	61	0.532	0.259	Secondary school	Speaking	Begiiiner	South East Asia	Late Adolescence

Note: ES: Effect Size; SE: Standard Error

Coding Process

Codes were assigned to each study based on several criteria to determine whether it met the inclusion criteria for this meta-analysis. These criteria included (a) research design,

(b) sample characteristics, (c) self-efficacy measures, (d) academic engagement measures, and (e) reported statistical information, such as Pearson's correlation coefficient (r) between self-efficacy and academic engagement. The findings of each investigation are summarised in Table 1.

Moderators Variables

Meta-analysis methods are suitable for determining whether a particular set of confounding factors was responsible for the findings of a previous body of research. According to Table 1, three potential moderator variables have been found. These variables are educational level, geographic region, and developmental stage.

Calculating effect sizes

The inclusion/exclusion criteria were followed by applying 15 effect sizes. Hedge's d is the effect size that has been determined. This approach was selected to assess the effectiveness of paired treatment because it produces a consistent effect size estimate in variations in sample size, measurement scale, and statistical testing. We pooled the PjBL that was being distributed to form the experimental group (E) and did the same thing to produce the control group (C). The effect size (d) was computed using the following formulas.

$$d = \frac{\bar{X}^E - \bar{X}^C}{S} J$$

Experimental subjects (XE) and non-experimental controls (XC) are denoted by "X" and "X", respectively. For the sake of the following calculation, the value of 'J' will be regarded as the sample correction factor.

$$J = 1 - \frac{3}{(4N^C + N^E - 2) - 1}$$

The standard deviation for the entire sample, denoted by S , can be calculated using the following formula:

$$S = \sqrt{\frac{(N^E - 1)(S^E)^2 + N^C - 1)(S^C)^2}{(N^E + N^C - 2)}}$$

Standard deviations for the experimental and control groups are denoted by sE and sC , respectively. In contrast, NE and NC stand for the corresponding sample sizes of the experimental and control groups. "NE"

$$V_d = \frac{(N^C + N^E)}{N^C N^E} + \frac{d^2}{(2(N^C + N^E))}$$

Numerator adjusted means and pooled SD of the denominator were used to determine impact size (d) (Cho et al., 2018).

Coding and Effect Size Reliabilities

Three of the authors independently coded all 15 effect sizes and six modifiers at least twice, and their results were then compared to measure intercoder reliability. The reliability of the effect sizes was calculated as a Pearson correlation. The fraction of agreement was used to calculate the dependability of other critical factors. All disputes were resolved through discussion. Table 2 shows the reliabilities of the initial codes for the effect sizes and moderators.

Table 2
The reliabilities of initial codes

	n	d	Educational Level	Level of Proficiency	Developmental stage	Geographic Region	English-language proficiency
Reliability	1	0.92	1	1	0.96	0.99	0.97

Data Analysis

Meta-analysis utilises

To analyse potential moderator variables of the link between self-efficacy and academic engagement, Excel and JASP software were used. Researchers use this software to compute Q statistics, such as QB (that is, Q values to test between-group differences) and QW (that is, Q values to stay within-group variability). The researchers used confidence interval plots (CI) and plot funnels to assess the magnitude of the effect and the possibility of publication bias.

Publication bias

A funnel-shaped spread of the findings arises in the absence of publication bias. Frequently, publication bias affects the plot (Ornprapat & Wiwat, 2015). Examining a publication's funnel plot findings reveals whether or not it contains bias. To conduct the Egger test, you must first create a funnel plot and change the mean.

Moderator Analysis

This study examined the effect size moderators of educational levels, gender, English language ability, and language learners as a target population. Combining data collection and analysis is possible when working with categorical variables.

RESULTS

Publication bias analysis

Figure 2 shows the funnel plot designed to help us assess the probability of publication bias by showing us the relationship between the standard error of the effect size (along the y-axis) and the effect size (along the x-axis). The asymmetry suggested this publication bias in the funnel plot. The funnel plot showed more positive than negative results, and many were found to be statistically significant. In this case, the signal

represented the mean of the impacts that were seen, or there was no evidence of asymmetric funnelling in the results.

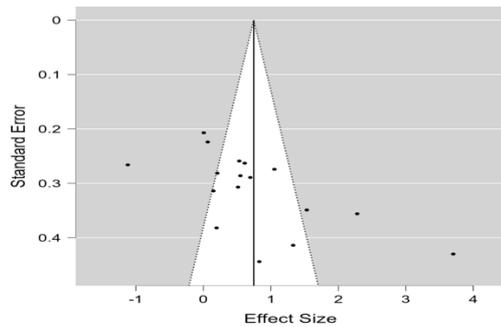


Figure 2
Plots for effect sizes in this meta-analysis

Overall Effect Size

On display in Figure 2 were the adjusted mean and variance homogeneity tests for each of the 15 possible effect sizes. Because there is such a wide range of impact sizes, the author chose to proceed with a detailed random-effects model. The standard deviation of the effect size was moderate.

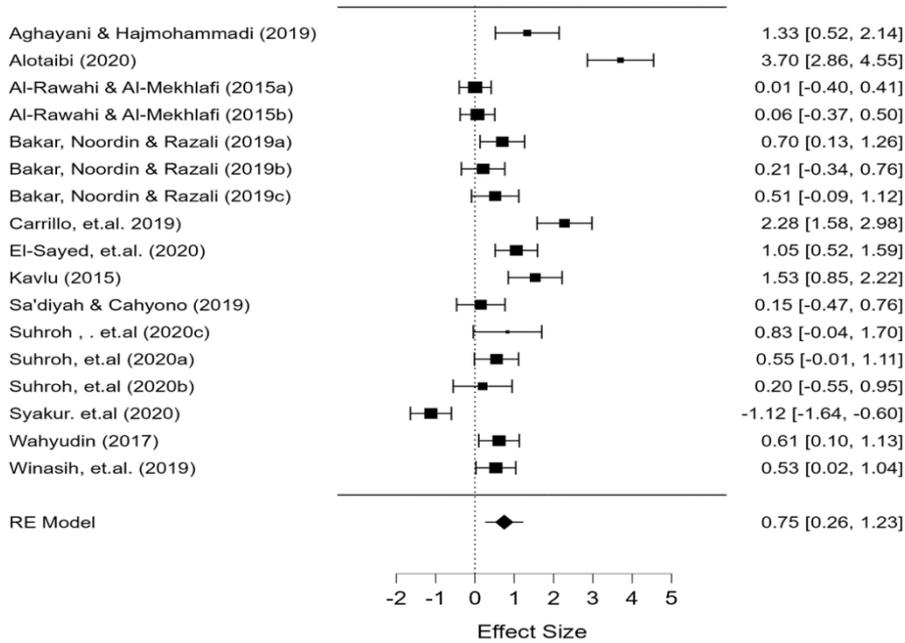


Figure 2
Effect size

Figure 2 shows the size of the effect in the forest plot as a black box, and the horizontal line represents a confidence interval that covers 95% of the possible values. Compared to the results of other investigations, the forest plot in the investigation (Alotaibi, 2020) had the highest significant mean effect size ($d=3.37$). And only one of the 15 trials had a low average effect size overall (0.01). Figure 2 shows that the average overall effect size is 0.75 or the moderate category with an average lower limit (0.26) and an average upper limit (1.23). It can be concluded that PjBL has a strong influence on English language skills.

Table 3

Mean impact sizes for English language proficiency of learners using PjBL with different settings

	Effect Size			95% CI		Test of null	Test of heterogeneity	
	k	d	se	LL	UL	z	QB	df
All Studies								
Level of education	2	0.746	0.248	0.261	1.231		31.653	1
University								
College		0.37	0.23	-0.081	0.820	1.609	54.086	
Secondary		1.289	0.462	0.383	2.195	2.790	62.127	
Elementary								
Level of Proficiency	3	0.746	0.248	0.261	1.231		26.399	2
Beginner		1.092	0.387	0.333	1.852	2.819	18.313	
Intermediate		0.093	0.705	-1.288	1.474	0.123	26.864	
Pre-intermediate		0.801	0.334	0.145	1.456	2.395	76.290	
Developmental stage	3	0.746	0.248	0.261	1.231		31.583	2
Early Adolescence		1.359	0.519	0.342	2.377	2.619	15.922	
Late Adolescence		1.064	0.531	0.022	2.105	2.002	53.446	
Adulthood		0.296	0.261	-0.215	0.807	1.135	46.915	
Geographic Region	2	0.746	0.248	0.261	1.231		17.561	1
West Asia		1.392	0.482	0.447	2.337	2.886		
South East Asia		0.301	0.183	-0.057	0.66	1.648		
English-language proficiency	3	0.746	0.248	0.261	1.231		45.089	2
Reading		0.775	0.734	-0.663	2.212	1.056		
Speaking		0.821	0.211	0.408	1.235	3.892		
Writing		1.273	0.849	-0.391	2.937	1.499		

Moderator variable analysis

Examination of the Modifying Variables

Researchers looked at the five moderators of variables that could influence the size of our effects. The results of the ANOVA-like mixed effects model with moderators are shown in Table 4.

Table 4
The results of moderator analyses with QB and QW

	Effect Size			95% CI		Test of null	Test of heterogeneity
	<i>k</i>	<i>d</i>	<i>se</i>	LL	UL	QB	QW
All Studies							
Level of education	2	0.746	0.248	0.261	1.231	31.653**	116.213
University							
College		0.37	0.23	-0.081	0.820	54.086	
Secondary		1.289	0.462	0.383	2.195	62.127	
Elementary							
Gender							
Level of Proficiency	3	0.746	0.248	0.261	1.231	26.399**	121.467
Beginner		1.092	0.387	0.333	1.852	18.313	
Intermediate		0.093	0.705	-1.288	1.474	26.864	
Pre-intermediate		0.801	0.334	0.145	1.456	76.290	
Developmental stage	3	0.746	0.248	0.261	1.231	31.583*	116.283
Early Adolescence		1.359	0.519	0.342	2.377	15.922	
Late Adolescence		1.064	0.531	0.022	2.105	53.446	
Adulthood		0.296	0.261	-0.215	0.807	46.915	
Geographic Region	2	0.746	0.248	0.261	1.231	17.561*	130.305
West Asia		1.392	0.482	0.447	2.337	94.694	
South East Asia		0.301	0.183	-0.057	0.66	35.611	
English Language Proficiency	3	0.746	0.248	0.261	1.231	45.089	102.777
Reading		0.775	0.734	-0.663	2.212	12.531	
Speaking		0.821	0.211	0.408	1.235	24.909	
Writing		1.273	0.849	-0.391	2.937	65.337	

* $p < .05$, ** $p < .01$, *** $p < .001$

Level of education

Four types of levels of education in the moderator variable are university, college, secondary, and primary. The findings showed that the differences in education levels show significant differences.

Level of proficiency

Three types of levels of *proficiency* in the moderator variable are beginner, pre-intermediate, and intermediate. The findings showed that differences in levels of *proficiency level*. There is an effect of PjBL on English language proficiency based on levels of *proficiency*.

Developmental stage

Three types of developmental stage in the moderator variable are early adolescence, late adolescence, and adulthood. The findings showed that differences in the types of developmental stage. The developmental stage moderates the effect of PjBL on English language proficiency.

The Geographic Regions

Two *geographical regions* as the moderator variable are West Asia and Southeast Asia. The findings showed that there is a significant difference in the types of *geographical regions*. Geographic regions moderate the effect of PjBL on English proficiency.

Language proficiency

Three types of language proficiency in the moderator variable are reading, speaking g, and writing. The findings showed that there is a significant difference in language proficiency. There is the effect of PjBL on the English language proficiency based on the type of language proficiency.

DISCUSSION

We conducted a moderator analysis to determine whether the the effect of PjBL on English language based on potential moderator variables. The results showed that potential moderator variables moderate the effect of project-based learning on English language proficiency.

Level Of Education

The findings related to the types of education level in the moderator variable showed that differences in education levels show significant differences. These findings align with the study results of Duman & Yavuz (2018), reporting that PjBL significantly influences students' attitudes toward English classes. In the context of PjBL-based English learning in higher education, the study by Sirisrimangkorn (2018) revealed that student speech proficiency had increased significantly after implementing project-based learning. Furthermore, students expressed a favourable opinion on PjBL using the presentation of English lessons at the university because it was considered to have helped improve their speaking skills. The results of the interviews revealed that PjBL uses positive presentations to improve the speaking skills of the learners. Therefore, the implementation of PjBL in both high school and college is very appropriate. This is because such an approach can allow learners to dig into the material and complete tasks in the way they are interested and conduct experiments collaboratively. To motivate themselves and also build knowledge in themselves, they can develop their knowledge as planned by investigating real-world experiences.

Developmental Stage

The findings of this study showed that the stage of development of the moderator variable could moderate the effect of PjBL on English language proficiency. These findings align with the results reporting that the value of Kimsesiz (2017) participants'

vocabulary increased: young learners from primary school to high school in the age range of 8 to 18 years taught with PjBL attachment. The results showed that PBL teaching could improve the acquisition of EFL vocabulary compared to standard methods. With the implementation of PjBL, young students become more active in the classroom (Kimsesiz 2017). Similarly, by applying PjBL in adolescence, the findings of Chiang and Lee (2016) revealed that it could motivate students to improve their learning and students' ability to solve learning problems in vocational schools. Previous research also revealed that PjBL could improve student speaking skills in a cooperative learning environment (Siririmangkorn 2018). Furthermore, the findings indicate that students have a positive attitude towards PjBL. On the basis of the results of the study, PjBL can be implemented at all levels of the development stage.

Geographical Regions

The findings of this study showed a significant difference in the types of *geographical regions*. Geographic regions moderate the effect of PjBL on English proficiency. In the context of *geographical regions*, the study's results reported that PjBL could Kemaloglu-Er & Sahin (2022) influence student progress in a multidimensional manner. The results of their research in a rural state school in the Marmara region of Turkey also revealed that PjBL was also able to increase interest and trust in the proficiency in using English. PjBL can also be an effective alternative learning strategy to develop skills related to real life, such as time management, creativity, decision making, and communication. (Kemaloglu-Erenunjukka & Sahin 2022)

In the context of English language learning in Asia, the results of the research in English language learning indicate that the implementation of PjBL in English language learning influences increasing motivation and autonomy in learning to listen and speak in universities in China. Furthermore, these findings show that the implementation of PjBL (Yiyang, 2015) can increase the ability of students to synthesise information. Based on the results of this study, we can report that PjBL can be implemented in all countries, although it has different characteristics between other countries and countries such as Asia and Erofa.

Language Proficiency

The results showed that three types of language proficiency in the moderator variable are reading, speaking g, and writing. The findings showed that there is a significant difference in language proficiency. There is an effect of PjBL on the proficiency of the English language according to the type of proficiency in the language. This is in line with the findings of the previous research. The study's results indicated a significant difference in students' compelling writing scores between the experimental and control groups Alotaibi (2020). This is supported by Alotaibi (2020a), which a positive effect of PjBL on developing persuasive essay writing. The study's results (Aghayani & Hajmohammadi, 2019) also reported that PjBL significantly influences EFL learners' writing skills. This PjBL model can help learners to select materials and tasks that suit their interests.

In the context of writing learning with a PjBL model, it can provide convenience for teachers in conveying how to write persuasive essays to students. These findings are consistent with the results of previous studies such as (Aghayani & Hajm. ohammadi, 2019; Alotaibi, 2020b) shows there is a positive influence of PjBL on the performance of students' writing skills. The implementation of PjBL in the process of working on this project allows learners to get the opportunity to activate their previous knowledge and experience. This PjBL implementation also stimulates learners to have the ability to work in groups. Learners are able to choose their projects based on interests and can present their projects. The results of Alotaibi's research (2020) also show that PjBL interventions in writing learning can make learners develop the ability to write persuasively. Because they are motivated and have the option to present their arguments for writing. This finding is supported by the results of many previous studies such as (Aghayani & Hajmohammadi, 2019) (Díaz Ramírez, 2014; Kovalyova et al., 2016), (Sadeghi et al., 2016).

The findings of this study suggest that an increase in component scores for the experimental group is more prominent than for the control group. This study's results show that PjBL significantly influences speech learning rather than traditional methods. These findings are supported by previous research that reported that project-based implementation has positively impacted speaking skills among students (Sayuti et al., 2020); (Zare-Behtash & Sarlak, 2017) With this PjBL, students may improve their knowledge and speaking skills because they have more opportunities to speak the language in an authentic environment.

In learning speaking, PjBL is considered a valuable method to develop the level of English-speaking skills of learners. Previous findings suggest that PjBL encourages learners to improve speaking skills, helping them to control their fear of speaking and increasing their interest in learning (Sayuti et al., 2020). Applying PjBL in English learning can also improve their vocabulary, grammar, fluency, pronunciation, organization, grammar, and content on what to say (Zare-Behtash & Sarlak, 2017). The results of previous studies also show that implementing PjBL encourages learners to learn independent and creative languages to become more competent in English speaking skills (Sirisbelaimangkorn, 2018). In the context of General English, PjBL becomes an alternative to students' language skills. The study's results also inform that with the implementation of this PjBL, the students felt that their reading, writing and speaking skills, as well as knowledge of vocabulary and translation skills, were improved (Poonpon, 2018). PjBL can stimulate Parra to obtain, analyze, and synthesize information. These findings indicate that PjBL can categorize and process information obtained from various sources can improve language skills (Idayu et al., 2019a; Sayuti et al., 2020). The results of previous studies show that English learners taught using PjBL teaching strategies significantly outperformed those taught using conventional teaching strategies (Idayu et al., 2019b). It is consistent with his research (Idayu et al., 2019a; Zhang, 2015). They showed that PjBL activities effectively improve the writing skills of EFL intermediate-level students in English. This is in line with the cognitive elaboration perspective that project-based learners should use cognitive restructuring or

elaboration to store information in memory and incorporate it into existing cognitive structures (Ebrahimi & Abbasian, 2017)

CONCLUSION

The results showed that the average impact measure value is a high degree of effect. PjBL has a significant impact on English language proficiency. The effect of PjBLi on English language proficiency differs based on potential moderator variables. The results showed that the level of education, language targets, geographical regions, and developmental stages had significantly different effects. Studies in primary, secondary, and tertiary schools revealed significant measurable impacts. The potential variable moderator becomes a moderator who can explain all population variants in various impact sizes. The effect of PjBL on English language proficiency significantly differs based on potential moderator variables... Studies conducted in the context of geographical areas were found to have a significantly measurable measure of effect. The context of the geographical area has a moderate positive effect. The geographical area is a moderator that can explain all population variants in different measures of effect. The stages of developmental has different measures of effect. Stages of development has a significantly measurable measure of effect. e adult employees have moderately positive effects. Childhood has a low positive effect. The stage of development show statistically significant differences. The potential moderator variables were a moderator that can explain all population variances in different measures of effect.

This research finding implies that PjBL can be applied in the teaching of English at the preschool, primary, high school, and college levels. The application of project-based English learning is a strategy to improve critical thinking skills, psychomotor improvement, self-confidence, and English competence at all levels of education. The application of PjBL in English courses is the basis for developing a curriculum based on PjBL for English at all levels of education. This study's limitation is that only a few articles are published in reputable journals that contain experiential research on the influence of PjBL English language proficiency. This is a source of inspiration for other researchers to conduct further research.

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