Project-Based Learning in ESP to Promote Self-Learning and Self-Efficacy: A Quasi-Experimental Study on Taiwanese EFL College Students

Pei-Ling Yang*
Fu Jen Catholic University

Retnowati M. Harijanto Bina Nusantra University

Abstract

English for Specific Purposes (ESP) courses have been required or suggested by most universities in Taiwan to prepare college learners with language skills in specific contexts for their future workplace. Many of these courses use hands-on activities or projects to authentically and actively involve English as a Foreign Language (EFL) learners in learning English. Learning results or performances are claimed to be influenced by different and multiple factors. Two of the most-discussed factors are self-learning and self-efficacy, which positively correlate with learning performance, especially in a learner-centered context. This study adopts a quasi-experimental design to examine the effect of Project-Based Learning on sophomores' levels of self-learning and self-efficacy in an ESP course in Taiwan. During an academic semester (18 weeks), the experimental group learners completed 3 ESP projects. Both experimental and control group learners reported their learning by answering two questionnaires, one on self-learning and the other on self-efficacy. After the semester, experimental group learners were interviewed to reflect on their ESP project experience. The study suggests the significant impact of Project-Based Learning on ESP college learners' levels of self-learning and self-efficacy in an EFL context. In addition, learners reported enhanced teamwork and oral presentation skills after completing ESP projects.

Introduction

In recent years, the most favorable teaching approach has shifted from teacher-centered to learner-centered. Learners are considered responsible for their learning in a learner-centered environment. Thus, self-learning or learner autonomy has been attracting more attention from researchers and instructors. Particularly during the COVID-19 outbreak, traditional face-to-face instruction is not available for everyone. For this reason, promoting self-learning is vital, which enables learners to take more responsibility for their learning and to self-regulate the learning processes. From an educational psychology perspective, self-efficacy is taken as a precursor to self-learning (Boekaerts et al., 2000). Whether in pandemic or post-pandemic time, learner autonomy or self-learning should be highly recognized and included in the list of major learning goals.

© creative commons

Yang, P. & Harijanto, R. M. (2022). Project-based learning in ESP to promote self-learning and self-efficacy: A quasi-experimental study on Taiwanese EFL college students. *TESOL Working Paper Series*, 20, 1-18.

Website: Hawaii Pacific University http://www.hpu.edu

^{*}Email: peiling1225@hotmail.com. Address: No. 510, Zhongzheng Rd., Xinzhuang Dist., New Taipei City 242062, Taiwan

English for General Purposes (EGP) is a compulsory subject for all of Taiwan's college students. Nowadays, however, English for Specific Purposes (ESP) courses in Taiwan are for both vocational students and college students. Students from different academic departments are advised to take at least one ESP course to become more autonomous learners. After graduation, they will be more competitive in an international workplace. In 2021, Taiwan's Ministry of Education (MOE) launched the Program on Bilingual Educations for Students in College, one of the nationwide plans to develop Taiwan into a bilingual nation by 2030 (Taiwan Financial Supervisory Commission, 2019). Therefore, ESP courses have also been suggested by Taiwan's MOE to be incorporated into freshman year's EGP courses. After taking EGP and ESP courses, Taiwan students would have less difficulty taking English Medium Instruction (EMI) courses. Tsao et al. (2008) observed:

In response to the great demand for English in academic, vocational and professional contexts, many schools in Taiwan are now offering an assortment of courses focusing on diverse subject areas for students to choose from. They aim to accommodate various student needs and wants, hoping to cultivate talents for all walks of life. They also attempt to familiarize students with area knowledge and skills specialized in each field in order to meet students' future needs. (p. 246)

This paper explores the effects of a teaching approach, Project-Based Learning (PBL), on two aspects of students' learning, self-learning and self-efficacy.

Before we present our study, we will first review the literature on the concepts of PBL and learner autonomy.

Project-Based Learning and English for Specific Purpose

Project-Based Learning (PBL), acknowledged as an innovative approach to promote self-learning and team collaboration, "involves students refining and honing their language skills through completion of projects both in and outside the classroom" (Laverick, 2019, p. 3). It takes multidisciplinary skills to carry out a project, including planning, searching, and discussing information. Oral or written report skills are also suggested to play a crucial role in PBL (Hedge, 1993). Both ESP and PBL have often been associated with the notion of authenticity, such as language use in authentic contexts or an authentic task or project. Authenticity is claimed to be a decisive factor in learner involvement (Mishan, 2005), and active involvement naturally leads to effective learning.

Project-Based Learning (PBL), as defined by Mamakou (2009, p. 464), "is a general term describing an instructional method that uses projects as the central focus of instruction in a variety of disciplines." PBL advocates learner-centered instruction along with real-world relevance and hands-on activities. PBL tasks promote more learner engagement (Beckett & Slater, 2005; Dörnyei et al., 2015), leading to long-term goal achievement. In addition, PBL enhances students' problem-solving skills, cooperation, motivation, multidisciplinary skill, and self-learning (Krajcik et al., 1999; Thomas, 2000). Thomas (2000) categorized five basic characteristics of PBL:

- 1. The foci of PBL are projects.
- 2. PBL is to inspire learners to deal with real-life problems.
- 3. PBL is to promote critical thinking.

- 4. The learners supervise and direct their learning and projects on their own.
- 5. The projects should be carried out based on real situations.

After completing projects, PBL learners would make a connection between what they have learned and what they will encounter in the world outside of school. Besides the benefits of PBL for learners, PBL instructors or lecturers may be encouraged to explore new possibilities for projects or assignments; they may be less worried about classroom management. PBL learners may become more interested and involved in the learning process (Kracjik et al., 1999). Particularly for ESL learners, learning should take place in real-life and meaningful contexts; they should also take on challenges to extend their current level of performance. Hence, by conducting an ESL project, learners would be able to build up deeper learning, critical thinking, and problem-solving skills (Gibbons, 2002; Newell, 2003).

English for Specific Purposes (ESP) is taught to English learners with exceptional language needs to carry out specific tasks through real-world communication for their future workplace (Nunan, 2004; Orr, 2002). Accordingly, ESP and PBL can support one another. The combination of ESP and PBL enables learners to be actively involved in knowledge-acquiring and project-making processes more collaboratively and authentically. Moreover, it allows learners to express themselves and communicate in authentic English contexts (Gatehouse, 2001). Mamakou (2009) further suggested that learner cooperation and active learning could be enhanced through PBL in ESP teaching. Due to PBL's problem-solving nature and language skill application, ESP could be well-taught.

PBL in an ESP class is proven to promote reading and speaking skills (Kristianto & Harendita, 2022). Shin's (2018) study results support that PBL positively influences learners' motivation and self-efficacy. A project-based and collaborative approach alleviates ESL learners' language learning anxiety (Miguel & Carney, 2022). Not many previous studies regarding ESP learners' self-learning or self-efficacy in a PBL context have been conducted (Kavlu, 2020; Shin, 2018). Hence, in this current ESP Project-Based Learning study, college sophomores are encouraged to complete ESP projects to measure their levels of self-learning and self-efficacy.

Self-Learning and Self-Efficacy

Learner autonomy, defined as the psychological state learners possess to take charge of their learning, promotes better learning outcomes (Holec, 1981; Littlewood, 1996). Self-learning and self-efficacy play crucial roles in achieving learner autonomy (He et al., 2011). In self-directed learning, learners take the initiative to establish learning goals, select appropriate learning strategies, and measure learning performance (Knowles, 1975). Furthermore, self-directed learners should be able to search for learning resources and to collaborate with peer learners (Cheng et al., 2010). With massive online resources, it is more convenient for self-directed learners to learn ubiquitously and monitor their learning processes (Snodin, 2013).

Self-efficacy is "beliefs in one's capabilities to organize and execute the course of action required to produce given attainments" (Bandura, 1997, p. 3). Bandura (1997) further claimed that personal, behavioral, and environmental factors influence human behavior. In the situation of completing a task, self-efficacy is a predictor for the outcomes. Similarly, self-efficacy could be

referred to as one's views about one's own capabilities to perform a learning task (Alzubaidi et al., 2016), considered a fundamental psychological factor influencing learning (Alt, 2015). Self-efficacy is a decisive element of how skillful, and knowledgeable a learner will be in the first place (Pajares, 1997).

Previous studies have explored self-efficacy and other language learning variables. For example, learners' self-efficacy predicts English learning achievement (Bai et al., 2019). It also serves as a mediator between learning contexts and outcomes. The context factors, such as teacher support or learner engagement, influence learning outcomes through self-efficacy (Dorman et al., 2009; Ma et al., 2018). Learners with high self-efficacy put in more effort and apply different strategies to complete difficult learning tasks (Kim et al., 2015; Wang et al., 2017). They also showed more engagement and satisfaction with their learning (Tas, 2016). In summary, self-efficacious learners engage more readily, work harder, and persist longer to overcome challenging problems and succeed in tasks (Zimmerman, 2000).

Research Questions

The present study aims to measure the effects of PBL on the levels of self-learning and self-efficacy of college ESP learners. During an academic semester (18 weeks), the learners were randomly divided into small groups to complete different ESP projects together. To complete the projects, not only a good command of English presentation skills but also technology application, teamwork, and self-regulation should be addressed. Thus, the research questions are as follows:

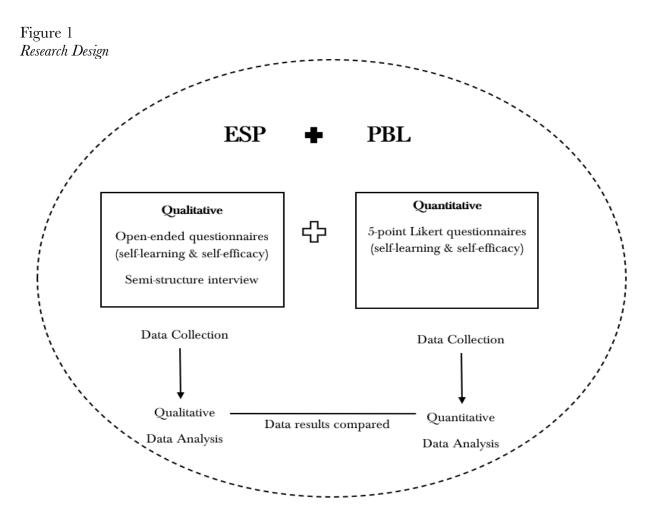
- 1. What are the effects of Project-Based Learning on ESP learners' levels of self-learning?
- 2. What are the effects of Project-Based Learning on ESP learners' level of self-efficacy?
- 3. What are the ESP learners' perceptions of Project-Based Learning?

Methods

Research Design

The current study used a quasi-experimental design and was carried out for one academic semester (18 weeks). Before the study intervention, the participants filled out a pre-questionnaire. The control group participants received conventional instruction (teacher-dominated and one-way instruction), while the experimental participants were under ESP project-based and student-centered instruction. For the experimental group, the teacher played a facilitative role while the learners took the initiative to search for information, deal with problems, and complete an ESP project.

This current study adopts "quantitative statistical results followed by qualitative quotes that support or disconfirm the quantitative results" (Creswell, 2009, p. 213). Figure 1 presents the research design of the study.



To investigate differences in the learners' levels of self-learning and self-efficacy, quantitative data were analyzed and compared with the interpretation of the qualitative data. They study design attempts to cross-validate or triangulate the findings.

Participants

The data were collected from 83 Taiwanese EFL college students taking an elective course, Workplace English for Communication. The participants were majoring in Applied Arts and Textiles & Clothing. None of them had experience with ESP projects. According to their college entrance exam results, their English proficiency ranged from A2 to B1 (Common European Framework of Reference for Languages).

Procedures

The 83 EFL college sophomores were divided into two groups: experimental and control. They were in an elective course, Workplace English for Communication, for one academic semester (18 weeks) and were recruited for the study. The course textbook, *Presentation Matters*, was selected

as the major learning material due to the easy-to-follow organization, i+1 language difficulty (Krashen, 1985), and diverse hands-on activities.

Table 1
The Instructional Methods and Procedures for the Experimental and Control Groups

	Control Group	Experimental Group			
Textbook	Unit 1: The foundation for presentations	Unit 1: The foundation for presentations			
content	Unit 2: Sell!Sell!Sell!	Unit 2: Sell!Sell!Sell!			
(Presentation	Unit 3: Developing a message	Unit 3: Developing a message			
Matters)	Unit 4: Delivering your message	Unit 4: Delivering your message			
,	Unit 5: Making it visual	Unit 5: Making it visual Unit 6: Summing Up Unit 7: Teamwork			
	Unit 6: Summing Up				
	Unit 7: Teamwork				
Textbook	Writing Activity:	Writing Activity:			
Activity	1. Write a cover letter.	1. Write a cover letter.			
	Please select one of your favorite Taiwan celebrities and write his/ her resume.	Please select one of your favorite Taiwan celebrities and write his/ her resume.			
	3. Design your business card.	3. Design your business card.			
	Speaking Activity:	Speaking Activity:			
	1. Describe your quality in 2 minutes, such as confidence, reliability, ambition, teamwork,	1. Describe your quality in 2 minutes, such as confidence, reliability, ambition, teamwork, and others.			
	and others.Voice-record the dialogues from	2. Voice-record the dialogues from the textbook.			
	the textbook.	3. Search for an advertisement and tell			
	3. Search for an advertisement and tell us its persuasion types, such as facts, feelings, or expertise.	us its persuasion types, such as facts, feelings, or expertise.			
ESP Project	None	Project 1: search for different English webpages, identify their layouts, and compare them from different perspectives: visual attractiveness, promotion strategies, and language use. Project 2: design your English website to sell and promote your products or service. Project 3: make a business proposal to sell and promote your products or service, including a two-page spread and a proposal.			

The experimental group students were required to participate in group discussions, oral presentations, and ESP projects (see an examine in Appendix B). As for the control group, the students only took part in group discussions to answer questions from the textbooks. For the two groups, TronClass, a learning management platform, was used to make announcements, collect assignments, and do roll calls. To promote the experimental group's multimodal skills, the students were also asked to apply different tools to present their ESP projects, including PowerPoint Slides, video recorders, film editing software, and so forth. The course for the two groups was conducted for 18 weeks (a total of 100 minutes per week), and the instructional methods and procedures are presented in Table 1.

Instruments

Two 5-point Likert questionnaires and a post-interview were used in this study. Both quantitative and qualitative data were collected and analyzed to yield more convincing and holistic findings.

Questionnaire

This present study adopted the pre- and post-questionnaires to explore the participants' levels of self-learning and self-efficacy. The pre- and post-questionnaires were identical, containing three parts (see Appendix A). In the first part, 13 items (adapted from Oxford, 1990, p. 282) were included to collect the participants' demographic information and previous learning experience. The 16 items of the second part adapted from Chen (2012) were to examine the participants' English self-learning before and after the 18-week study. The third part of the questionnaire included 19 items (adapted from Mikulecky et al., 1996; Wang et al., 2013) reporting their English self-efficacy levels. The calculated reliability coefficient (Cronbach α) was .86 for self-learning and .898 for self-efficacy.

Interview

Semi-structured individual interviews were held after the questionnaire collection to uncover the participants' innermost feelings and thoughts about the English instruction and ESP projects. The ten interviewees voluntarily participated in the interview, which was conducted in Mandarin Chinese. All the contents of the interviews were recorded and transcribed for further analysis.

Data Collection and Analysis

Data collection took place over four months, from September 2021 to January 2022. Data were collected mainly through self-learning and self-efficacy questionnaires and semi-structured interviews. Data, including the questionnaire and post-interviews, were analyzed. All the responses from the questionnaire were processed through IBM SPSS Statistics (Version 22) for quantitative analysis.

To examine the differences in self-learning and self-efficacy between the two groups, an independent t-test and one-way ANCOVA were utilized. Normality, interval data, homogeneity of variance, and independent scores were checked to meet the assumptions of independent t-tests. In addition, the skewness and kurtosis values were smaller than 2,29, which satisfied the assumptions of homogeneity of regression slopes. Medium-sized samples with skewness and

kurtosis values larger than 2.29 are considered non-normality (Kim, 2013). The interview data were viewed, analyzed, and categorized into different major themes by the researcher and peer-checked by a co-worker who was also an English language instructor.

Results

In this study, the questionnaire and interview were conducted to obtain learners' feedback and perceptions regarding PBL in an ESP course. Descriptive statistics were first provided, including the mean, Standard Deviation (SD), minimum, and maximum scores. Accordingly, one-way ANCOVA results were presented to examine the effect of ESP Project-Based Learning on the learners' levels of self-learning and self-efficacy. Homogeneity of variances was first examined. The sig. values of self-learning and self-efficacy are .29 and .16; hence, the assumption of homogeneity of variances has not been violated.

The Effects of Project-Based Learning on ESP Learners' of Self-Learning

Table 2

Descriptive Statistics for Self-Learning

	n	Mean	SD	Min.	Max.
Experimental Group					
Pretest	43	3.76	.366	1	5
Posttest	43	4.06	.450	1	5
Control Group					
Pretest	40	3.76	.439	1	5
Posttest	40	3.81	.463	1	5

Table 3
One-Way ANCOVA Results of Self-Learning

Dependent Variable: Post-self-learning

Source	Type III SS	Df	MS	F	Sig.	Partial Squared	Eta.
Corrected Model	13.124ª	2	6.562	103.285	.000	.721	
Intercept	.127	1	.127	2.005	.161	.024	
Pre-test reading	11.780	1	11.780	185.413	.000	.699	
Group	1.397	1	1.397	21.989	.000	.216	
Error	5.083	80	.064				
Total	1306.508	83					
Corrected Total	18.207	82					

Note. R Square = .721 (Adjusted R Square = .714).

As Table 2 shows, the self-learning levels of both groups improved. However, to demonstrate significant improvements, one-way ANCOVA was conducted. The sig. value, .000 (less than .05), indicates that the scores obtained by the control and experimental groups regarding self-learning levels differ significantly (see Table 3) with Cohen's d effect size of .558. In other words, after the intervention of ESP Project-Based Learning, the experimental group of learners possess higher self-learning levels than the control group.

The Effects of Project-Based Learning on ESP Learners' Levels of Self-Efficacy

Concerning EFL learners' self-efficacy, no significant difference between the two groups was found at the beginning of the semester (see Table 4). Afterward, as shown in Table 5, the analysis of one-way ANCOVA showed that the difference in self-efficacy was significant (F(1, 80) = 18.921. p = .000). Its effect sizes (Cohen's d = .577) also suggest that study design does make a significant medium difference. Further examination of the post hoc (Bonferroni-adjusted) pairwise comparison showed that learners in the experimental group experienced statistically higher levels of self-efficacy.

Table 4

Descriptive Statistics for Self-Efficacy

	n	Mean	SD	Min.	Max.
Experimental Group)				
Pretest	43	3.75	.314	1	5
Posttest	43	4.10	.459	1	5
Control Group					
Pretest	40	3.77	.314	1	5
Posttest	40	3.81	.529	1	5

Table 5
One-Way ANCOVA Results of Self-Efficacy

Dependent Variable: Post-self-efficacy

Source	Type III SS	Df	MS	F	Sig.	Partial Squared	Eta.	
Corrected Model	13.368ª	2	6.684	66.173	.000	.623		
Intercept	.239	1	.239	2.363	.128	.029		
Pre-test reading	11.674	1	11.674	115.578	.000	.591		
Group	1.911	1	1.911	18.921	.000	.191		
Error	8.081	80	.101					
Total	1324.723	83						
Corrected Total	21.449	82						

Note. R Square = .623 (Adjusted R Square = .614).

In summary, ESP Project-Based Learning has increased the experimental group participants' levels of self-learning and self-efficacy. Overall, they felt more confident in their English performance and motivated themselves to learn English. In addition, they would like to monitor their learning progress and search for knowledge or information to deal with English problems. They became more aware and conscious of their learning progress and performance.

ESP Learners' Perceptions Toward Project-Based Learning

Through the ESP projects, the learners (from Applied Arts and Textiles and Clothing majors) acquired greater ESP vocabulary knowledge, analyzed authentic language found on English websites, and promoted their product via proposal and Social Networking Services (SNS). Their ESP projects represent a good command of language use and artistic creativity (Appendix B). ESP projects, to some degree, bridge the distance between English learning classroom and the real world.

The experimental group learners were asked to reflect on the ESP Project-Based Learning. Their reflection was collected and analyzed. Furthermore, ten of them were also invited to join the interview. As far as the reflection and interview findings are concerned, the learners' positive stances and attitudes towards ESP Project-Based Learning were revealed. Notably, they seemed to enjoy this kind of learning context in which they found resources and chances to work with others to complete a task. In addition, they expressed their higher motivation to learn English. After the semester, they thought they had better performance, particularly in English oral proficiency and presentation skills. The findings are categorized and outlined in the excerpt below.

Improvement of Oral Presentation Skills

S11: My oral English is improved because I need to tell others about the projects. I practice saying English before the presentation.

S14: I have learned some English about how to present our projects in front of others.

S20: I dare say something in English and I become not so afraid of making mistakes. To be able to express my ideas is more important than 100% accuracy.

Enhancement of Teamwork Skills

S4: For the first group project, it did not go well due to miscommunication. We were in a hurry to complete the project. The result was not satisfying. But we did not give up. For the second project, we had different tasks to do and we all did our parts well. I think I learned how to work with others from course projects.

S12: I have a better understanding of group projects and how to get along with others. If group members can communicate with each other, project results will be better. I have learned how to control my bad temper and began to listen to others attentively.

Motivation for Self-Learning

S1: After completing the projects, I think learning English is interesting. Before this course, I learn because teachers ask me to do so. But now I think I can search for something online and learn something I am interested in by myself.

S17: English projects are not easy for me, but I still try to find different ways to solve problems.

S30: To work on different projects, I start to google English information. When I don't know how to express my ideas in English, I google it. I also use online dictionaries to teach me how to pronounce some English words.

Boost of Self-Efficacy

S8: I have more confidence to speak English in front of others.

S23: After the semester, I think I have better English performance and know more English vocabulary.

S40: Before I did not want to read English articles or browse English websites. But this semester, we need to complete English projects. I try to read online English websites to find some information that I need for my projects. At first, I feel a bit tense. I think my English is not good enough. But probably after the second project, I start to feel more comfortable.

To sum up, the learners' perceptions toward ESP Project-Based Learning are positive. Their English oral presentation and teamwork skills have been enhanced; they also claim to possess higher levels of self-learning motivation and self-efficacy after the study.

Discussion and Conclusion

Furthering the research of Project-Based Learning, this current study has adopted a quasi-experimental design to provide empirical findings about EFL learners' self-learning and self-efficacy before and after the intervention of ESP projects. As mentioned earlier, self-learning and self-efficacy are crucial in learner-centered learning. The findings revealed that the ESP projects positively and significantly influenced the participants' levels of self-learning and self-efficacy.

The first research question was about the effect of Project-Based Learning on ESP learners' levels of self-learning, as perceived by the learners. The experimental group participants reported higher levels of self-learning. The first results support previous research by Alsamani & Daif-Allah (2016) and Kavlu (2020).

The second research question was about the differences in the learners' self-efficacy after the study. The learners in the experimental group participated in challenging activities and reported positive attitudes about completing different tasks. Hence, they reported increased self-efficacy, which was in line with Bandura's social cognitive theory (1997). These findings are also consistent with Shin's study (2018).

Concerning the third research question, the participants were asked to reveal their perceptions of Project-Based Learning, and the findings corroborate what Kristianto and Harendita (2022) found. The participants thought their English oral performance was enhanced.

They also reported better people skills to work work well with peers to complete an ESP project (Alsamani & Daif-Allah, 2016). In addition, the qualitative data reported having higher levels of self-learning and self-efficacy, which is in line with the quantitative data results (self-learning and self-efficacy questionnaires).

Implications and Limitations

While there is an increasing amount of literature on how to apply PBL into EFL classrooms, there is a comparative lack of research on how to incorporate PBL with ESP courses to promote higher levels of self-learning and self-efficacy. Three major findings are revealed after the study. Firstly, incorporating English and specific tasks or projects can motivate learning. Learners feel empowered to deal with problems and complete a project. Secondly, the team atmosphere also plays a crucial role. To work on a group project, each member not only gets his or her job done but also needs to communicate with others effectively. Lastly, more than one project should be assigned during an academic semester. The first project tends to be a trial-and-error project. Learners learn from the first trial and then they find alternative ways to improve their teamwork and project performance.

Due to the small number of participants (n=83) from only one context, the findings cannot be easily generalized to other contexts. Similar studies can be implemented in different or multiple contexts for longer, and more participants should be recruited to yield more comprehensive results. Based on the above results and discussion, future PBL classroom research should include other psychological factors and strategy applications. For example, motivation and anxiety do influence learning. To improve learning performance, learning strategies should be taught and applied. Despite these limitations, the study has demonstrated the positive effect of ESP projects on EFL adult learners' levels of self-learning and self-efficacy.

References

- Alsamani, A. A. S., & Daif-Allah, A. S. (2016). Introducing Project-Based Instruction in the Saudi ESP classroom: A study in Qassim University. *English Language Teaching*, 9(1), 51-64.
- Alt, D. (2015). Assessing the contribution of a constructivist learning environment to academic self-efficacy in higher education. *Learn. Environ. Res.*, 18, 47-67.
- Alzubaidi, E., Aldridge, J. M., & Khine, M. S. (2016). Learning English as a second language at hte university level in Jordan: Motivation, self-regulation and learning environment perceptions. *Learn. Environ. Res.*, 19, 133-152.
- Bai, B., Chao, G. C. N., & Wang, C. (2019). The relationship between social support, self-efficacy, and English language learning achievement in Hong Kong. *TESOL Quarterly*, 53(1), 208-221. https://doi.org/10.1002/tesq.439
- Bandura, A. (1997) Seft-efficacy: The exercise of control. New York: Freeman.
- Beckett, G. H., & Slater, T. (2005) The project framework: A tool for language, content and skills integration. *ELT Journal*, 59(2), 108-16.

- Boekaerts, M., Pintrich, P. R., & Zeidner, M. (Eds.). (2000). *Handbook of self-regulation*, CA: Academic Press.
- Chen, N. (2012). Autonomous learning in the context of computer-based multimedia college English teaching and learning. *Theory and Practice in Language Studies*, 2(12), 2541-2547.
- Cheng, S. F., Kuo, C. L., & Lee-Hsieh, J. (2010). Development and preliminary testing of a self-rating instrument to measure the self-directed learning ability of nursing students. *International Journal of Nursing Studies*, 47(9), 1152-1158.
- Creswell, J. W. (2009). Research design: Qualitative, quantitative, and mixed methods approaches (3rd ed.). Los Angeles: SAGE.
- Davis, R. H., & McCollister, M. (2022). Presentation Matters. Taiwan: Tung Hua Book Co., Ltd.
- Dorman, J. P., & Fraser, B. J. (2009). Psychosocial environment and affective outcomes in technology-rich classrooms: Testing a casual model. *Social Psychology of Education*, 12(1), 77-99. https://doi.org/10.1007/s11218-008-9069-8
- Dörnyei, Z., Henry, A., & Muir, C. (2015). *Motivational Currents in Language Learning: Frameworks for Focused interventions*. New York: Routledge.
- Gatehouse, K. (2001). Key issues in English for specific purposes (ESP) curriculum development. *The Internet TESL Journal*, 7(10), 1–10.
- Gibbons, M. (2002). Scaffolding Language, Scaffolding Learners. Portsmouth, NH: Heinemann.
- He, Q., Valcke, M., & Zhu, C. (2011). Promoting a special learning environment for second language learning in a Chinese rural primary school. *Procedia Social and Behavioral Sciences*, 12, 137–144.
- Hedge, T. (1993). Key Concepts in ELT. ELT Journal, 47(3), 275–277.
- Holec, H. (1981). Autonomy and foreign language learning. Oxford: Pergamon Press.
- Kavlu, A. (2020). The Effect of Project-Based Learning on First-Year Undergraduate Students in English for Specific Purposes (ESP) Courses. *International Journal of English Linguistics*, 10(4), 227-239.
- Kim, H. Y. (2013). Statistical notes for clinical researchers: assessing normal distribution (2) using skewness and kurtosis. *Restorative dentistry & endodontics*, 38(1), 52–54. https://doi.org/10.5395/rde.2013.38.1.52
- Kim, D. H., Wang, C., Ahn, H. S., & Bong, M. (2015). English language learners' self-efficacy profiles and relationship with self-regulated learning strategies. *Learning and Individual Differences*, 38, 136–142. https://doi.org/10.1016/j.lindif.2015.01.016
- Knowles, M. (1975). Self-directed learning: A guide for learners and teachers. New York, NY: Association Press.
- Krajcik, J., Czerniak, C., & Berger, C. (1999). *Teaching science: A project-based approach*. McGraw-Hill College, New York.
- Krashen, S.D. (1985). The input hypothesis: Issues and implications. New York: Longman.
- Kristianto, I. I., & Harendita, M. E. (2022). The implementation of Project-Based Learning in an ESP class to improve reading and speaking skills. *ELTR Journal*, 6(1), 1-10. https://doi.org/10.37147/eltr.v6i1.126
- Laverick, E. K. (2019). Project-Based Learning. Alexandria, VA: TESOL Press.
- Littlewood, W. (1996) Autonomy: An anatomy and a framework. System, 24, 427-435.

- Ma, L. Du, X., Hau, K. T., & Liu, J. (2018) The association between teacher-student relationship and academic achievement in Chinese EFL context: A serial multiple mediation model. *Educ. Psychol.*, 38, 687–707.
- Mamakou, I. (2009). Project-based instruction for ESP in higher education. In R. de Cássia Veiga Marriott & P. Lupion Torres (Eds.), *Handbook of Research on E-Learning Methodologies for Language Acquisition* (pp.456-479). Hershey, Pennsylvania: IGI Global.
- Miguel, E., & Carney, W. (2022). Foreign Language Acquisition Anxiety and Project-Based Learning in Collaborative L2 Instruction: A Case Study. *Theory and Practice in Language Studies*, 12(1), 1-6.
- Mikulecky, L., Lloyd, P., & Huang, S. C. (1996). *Adult and ESL literacy learning self-efficacy questionnaire*. Bloomington, IN: Language Education Department, Indiana University at Bloomington.
- Mishan, F. (2005). Designing Authenticity into Language Teaching Materials. Intellect, Bristol, UK.
- Newell, R. J. (2003). Passion for Learning: How Project-Based Learning Meets the Needs of 21st Century Students. Lanham, MD: Scarecrow Press.
- Nunan, D. (2004). Task-Based Language Teaching. Cambridge University Press.
- Orr, T. (2002). The nature of English for specific purposes. English for Specific Purposes (edited by Thomas Orr). Alexandria, Virginia: Teachers of English to Speakers of Other Languages, Inc., 1-6.
- Oxford, R. L. (1990). Language learning strategies: What every teacher should know. Boston, MA: Heinle & Heinle Publishers.
- Pajares, F. (1997). Current direction in self-efficacy research. In M. Maehr & P.R. Pintrich (Ed.), *Advances in Motivation and Achievement* 10, 1-49. Greenwich, CT: JAI Press.
- Shin, M. H. (2018). Effects of Project-based Learning on Students' Motivation and Self-efficacy. *English Teaching*, 73(1), 95-114.
- Snodin, N. S. (2013). The effects of blended learning with a CMS on the development of autonomous learning: A case study of different degrees of autonomy achieved by individual learners. *Computers & Education*, 61, 209–216.
- Taiwan Financial Supervisory Commission. (2019). *Taiwan's 2030 goal to become a bilingual nation*. Retrieved from https://www.fsc.gov.tw/en/home.jsp?id=253&parentpath=0,4,212,252
- Tas, Y. (2016). The contribution of perceived classroom learning environment and motivation to student engagement in science. *Eur. J. Psychol. Educ.*, 31, 557–577.
- Thomas, J. W. (2000). A review of research on project-based learning. Retrieved 27 June 2022 from http://www.autodesk.com/foundation.
- Tsao, C. C. H., Wei, A. M. S., & Fang. A. C. H. (2008). ESP for College Students in Taiwan: A Survey of Student and Faculty perceptions. 2008 International Symposium on ESP. Retrieved from http://ir.fy.edu.tw/ir/bitstream/987654321/2992/1/13%20ESP%20for%20college%20Ss%20in%20Taiwan.pdf
- Wang, C. W., Kim, D. H., Bong, M., & Ahn, H. S. (2013). Examining measurement properties of an English Self-Efficacy scale for English language learners in Korea. *International Journal of Educational Research*, 59, 24-34.

- Wang, C. H., Harrison, J., Cardullo, V., & Xi, L. (2017). Exploring the relationship among international students' English self-efficacy, using English to learn self-efficacy, and academic self-efficacy. *Journal of International Students*, 8(1), 233–250. https://doi.org/10.5281/zenodo.1134299
- Zimmerman, B. J. (2000). Self-Efficacy: An Essential Motive to Learn. *Contemporary Educational Psychology*, 25(1), 82-91. https://doi.org/10.1006/ceps.1999.1016

Appendix A Questionnaire

Part 1: Background 1	Informa	ntion ~	•			
1. Name:	2. Cla	ss:	3. Year of Bird	th:		
4. Sex:5	. Native	e Language:				
6. How long have yo	u been	studying Engli	ish?(years)		
7. How do you rate y	your ov	erall proficien	cy in English a	s comp	ared with the proficie	ncy of other
students in your class	5					
Excellent	Good		Fair		Poor	
8. How do you rate	8. How do you rate your overall proficie				ompared with the pr	oficiency of
native speakers of Er	nglish?					_
Excellent	Good		Fair		Poor	
9. How important i	s it for	you to become	proficient in F	English?)	
Very important		Important	Not so important			
10. Why do you wan	t to lea	rn English? (C	heck all that a _l	oply)		
interested in the language			need it	for my	future career	
interested in	the cult	ture	need it			
have friends who speak the		others:				
language						
required to take a language						
course to graduate						
11. Do you enjoy En	glish le	arning?				•
Yes	No)				
12. What other langu	ages h	ave you studie	d?		_	
13. What has been ye	our fav	orite experienc	ce in English le	arning?)	

Part 2: Self-Learning

- 1. When I have difficulty answering a reading comprehension question, I get help from others.
- 2. I can assess my own reading progress.
- 3. After class, I try to find chances to read English on my own.
- 4. It is difficult for me to create a practical reading schedule for myself.
- 5. I keep in line with my predetermined plan while completing an English learning task.
- 6. If I notice that my method of reading is inappropriate, I quickly find a more practical one.

- 7. I utilize available learning resources, such as the Internet, dictionaries, etc. to boost my English reading and writing.
- 8. I think collaboration with my classmates helps to improve my English reading.
- 9. I like trying new techniques while reading English texts.
- 10. I can consciously monitor my English learning progress.
- 11. If I have a problem with English, I am confident I can solve it.
- 12. I feel I can define my own objective in English learning.
- 13. Teachers should be the ones to decide my English learning contents.
- 14. Exams are what motivate me to work hard in English learning.
- 15. An English exercise is only worth doing if it is marked by teachers.
- 16. It is important for teachers to give students English vocabulary to learn.

Part 3: Self-Efficacy

- 1. I have no problem learning English reading skills.
- 2. I am not very good at learning writing skills.
- 3. I avoid trying to read new English articles when they look too difficult for me.
- 4. I feel insecure about my ability to write clearly.
- 5. I can motivate myself to read English.
- 6. My English writing assignment worries me.
- 7. I learn new English words easily.
- 8. If I can't understand an English reading the first time, I keep trying until I can.
- 9. English reading is boring.
- 10. I enjoy reading English.
- 11. When I decide to read English texts, I go ahead and do it.
- 12. Doing well in learning English is not one of my goals in life.
- 13. I do a good job of participating in English class discussions.
- 14. I can write an English paragraph without mistakes.
- 15. I can guess the meaning of unknown words when I am reading an English text.
- 16. I can read English-language magazines.
- 17. I can write an English-language magazine article.
- 18. I do a good job of completing an English assignment.
- 19. I enjoy writing English.

Appendix BA sample of ESP Projects to sell and promote student-made products.



About the authors

Pei-Ling Yang is currently an assistant professor at Fu Jen Catholic University, Taiwan. She has over 10 years of experience teaching English as a foreign language at universities. She earned her MA in ELT and Multimedia at University of Warwick, UK, and Ph.D. in TEOSL at Tamkang University, Taiwan. Her academic area of interest includes learning strategies, self-efficacy, technology-assisted language learning, Project-Based Learning, and English picture books.

Retnowati M. Harijanto earned an MA in American Studies at Gadjah Mada University, Yogyakarta, Indonesia. She is now a lecturer in the English Department at Bina Nusantara University, Indonesia. Her field of specialization includes folktales, multicultural literature, and college learners' English reading comprehension.