

Effects of Mind Map Integrated Project-Based Learning on the Reduction of English Speaking Anxiety on Chinese Undergraduates

Zhinan Li¹, Samah Ali Mohsen Mofreh¹, Chen Jiao² & Aihua Zhu¹

¹ School of Educational Studies, Universiti Sains Malaysia, Penang, Malaysia

² School of Languages, Literacies and Translation, Universiti Sains Malaysia, Penang, Malaysia

Correspondence: Samah Ali Mohsen Mofreh, School of Educational Studies, Universiti Sains Malaysia, Penang, Malaysia.

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Abstract

The problems of English speaking unproficiency, low interest and silent English classrooms among students in Chinese higher vocational colleges have become an issue in recent years in China. Due to the importance of the mind map has become very popular in English language instruction, this paper carries out a study to investigate the effectiveness of Mind Map integrated Project-Based Learning (PjBL) strategy in public English language teaching in one of the Chinese higher vocational colleges and designs an English speaking project on food in the campus cafeteria. Twenty freshman students majoring in preschool education are selected in the experimental group and divided into four sub-groups of five students per group to select their tasks for the project so that they can be stimulated to finish the project independently and cooperatively. The other twenty students of the same major are in the control group to compare. The study uses mixed methods by combining quantitative and qualitative methods through students' English speaking anxiety tests before and after the project by using Horwitz's Foreign Language Classroom Anxiety Scale (FLCAS) and a semi-structured interview as a supplement to investigate. It turns out that the Mind Map Integrated Project-Based Learning (PjBL) Strategy reduced students' English speaking anxiety to a certain degree.

Keywords: mind map, PjBL, English speaking anxiety, Chinese undergraduates

1. Introduction

Following years of development and emphasis on teaching spoken English in China, there has been some improvement in students' English speaking proficiency. Still, the state of English speaking instruction today is unsatisfactory. There are still certain problems in English Speaking learning and teaching, which must be taken into account and fixed (Wu, 2022). Chinese higher vocational college students still exhibit speech apprehension when speaking, even with a stronger voice intended to improve speaking competence (Liu, 2013). Many Chinese students speak English incorrectly, stutter through entire sentences, and even find it difficult to communicate fluently with other group members during cooperative group projects due to oral expression barriers, slow learning rates, and oral expression difficulties (Lindemann, 2015).

The acquisition of a second language is significantly harmed by affective variables in investigations of factors influencing language learning (Hulya, 2009). It has also been demonstrated that anxiety, one of the key affective components, impedes language development (Ioanna et al., 2017). It negatively affects all four language skills—speaking, listening, reading, and writing, with speaking being the most affected (Liu, 2013). According to Zhao et al. (2013), a significant proportion of Chinese students still struggle with English Speaking Anxiety when they speak English despite studying the language for an average of 12 years.

To teach and learn English, the mind map is one of several ways. Teaching writing, reading, and speaking with mind map is a popular approach among educators (Asrifal, 2016). Murley (2007) states a mind map is a visual organizer where the main thought is derivable from a central notion and sub-ideas are shown as branches of larger branches. The value of mind map is based on the idea that learning should be an active process, where the learner does the learning rather than the teacher doing it for them (Madu & Metu, 2012, p. 248). Project-Based Learning (PjBL) is a learning approach that gives teachers the chance to oversee student learning in the classroom by incorporating project work, according to Wen (2009, p. 114). There are many studies on PjBL in

English language education in China to study the benefit of PjBL used in English language classrooms (Wen, 2021). Susilawati et al. (2017) investigated the use of Project-Based Learning (PjBL) with mind maps to enhance junior high students' environmental attitudes toward trash management. However, few studies on Mind Map integrated Project Based Learning (PjBL) on English speaking Anxiety. This paper tries to implement a study to investigate the effectiveness of Mind Map integrated Project-Based Learning (PjBL) on Chinese higher vocational college students' English speaking anxiety.

1.1 Statement of the Problem

The examination-centered nature of English education in China alienates the language's intended use and neglects its communicative function, giving rise to phenomena like "high scores but low abilities" and "dumb English" (Huang, 2011). English speaking anxiety has simultaneously always been a major source of concern for students and has emerged as a pressing problem in the study and teaching of foreign languages (Meng, 2010). Previous research has demonstrated that anxiety in foreign language learners is especially noticeable during speaking learning, which makes learners bored with speaking learning and even avoid it (Wang et al., 2014). Brown (2001) identifies shyness, anxiety, and fear as the main psychological causes of students' reluctance to communicate. According to Gebhad (2000), the primary reasons why learning to speak aloud is difficult include anxiety. Learners suffer anxiety when they are unable to express themselves fully in a foreign language due to their poor proficiency (Horwitz, 2013). Zhang (2019) claims that there is a bad correlation between FL anxiety and FL performance. Naturally, language teachers are interested in the causes of language anxiety to plan their lessons in a way that reduces anxiety reactions from students (Horwitz, 2001). Many research studies analyzed the relationship between anxiety and academic performance in foreign language learning and tried to reduce English speaking anxiety. However, there is still more need to explore mind map due to foreign language learners typically thinking in their original language rather than the way they think in English when they speak English (Wen, 2015). Project-based learning allows students to collaborate in teams to find solutions to challenges in addition to having them apply their knowledge to real-world situations (Solomon, 2003). Also, Project-Based Learning emphasizes the integration of knowledge and action, and students learn both professional knowledge and solve practical problems in the process of completing project activities (Markham, 2011). According to Lee, Blackwell, Drake and Moran (2014), research on PjBL in higher education has lagged behind the steady growth of PjBL in K1 to 12 education. To fill the gap and solve the problem of English Speaking Anxiety among students in Chinese higher vocational colleges, this paper intends to research Mind Map integrated Project-based Learning to answer the following research questions.

1.2 Research Questions

- 1) Does Mind Map Integrated PjBL affect students' English Speaking Anxiety?
- 2) Is there any significant difference in English speaking anxiety between the experimental group and the control group?

1.3 Significance of the Study

The study will provide important data for the effectiveness of mind map Integrated Project-Based Learning on English Speaking Anxiety among Chinese undergraduates. The findings are anticipated to provide information for future research on English as a Foreign Language, particularly in the area of public speaking anxiety. Besides, the findings of the research can serve as a reference for research of mind map in English language education especially in the aspect of English speaking.

2. Literature Review

2.1 Project-Based Learning (PjBL)

Project-based learning (PjBL) is an inquiry-based teaching approach that involves students in the creation of new knowledge by having them work on relevant projects and create useful products (Brundiers & Wiek, 2013; Krajeik & Shin, 2014). According to Chmelárová and Pasiar (2017), project-based learning is regarded as a very effective tool for student mobilization, engaging interpretation of academic content, learning new things, as well as for developing the character traits required for working with others and resolving conflict. Students get valuable interpersonal skills and exposure to varied viewpoints and methodologies while working collaboratively on a project (Byun 2007). It enables students to learn by looking for answers, posing queries, discussing concepts, formulating plans, and interacting with others (Choi et al., 2019). Project-Based Learning provides students with the opportunity to learn to design, implement, produce, and evaluate projects through individual and team perseverance in authentic and challenging projects, thus achieving the desired learning objectives and self-improvement (Bas & Bayham, 2010). Students may independently identify practical and complicated

challenges, create solutions, and conduct collaborative research to solve difficulties through project-based learning (Lee et al., 2015). In the English classroom, Project-Based Learning provides students with opportunities to practice listening, speaking, reading, and writing, and allows students to use listening, speaking, reading, and writing skills as they complete projects that will lead to the enhancement of these skills (Beckett, 2002). Project-based Learning not only improves students' knowledge and professional skills but also enhances their sense of responsibility, logic and independence, self-esteem and self-confidence (Bell, 2010). Beckett (2002) states that projects in PBL are week-long or semester-long projects that require individuals or groups to work collaboratively to complete and the tasks of the activity include formulating a research question, developing a research protocol, information gathering, analyzing data, and presenting the results of the project in an oral or written report. Project-Based learning uses projects as learning media to achieve competencies in attitudes, knowledge, and skills (Santayasa et al., 2020). Thus, it is a very useful and helpful approach to English language education.

2.2 Mind Map

Mind map is one kind of pre-doing exercise that instructors typically use (Nasution, 2020) to assist students in coming up with ideas, taking notes, and selecting thoughts that are pertinent to the subject of writing in a visual format (Hemmati & Khodabandeh, 2017). Additionally, Mind map facilitates the process by which students relate newly acquired knowledge to prior understanding (AlMutairi, 2015; Araujo & Gadanidis, 2020; Riswanto & Prandika, 2012). Students can identify facts, a subject's general structure, and its component elements by using this technique (AR, 2017). It is a known fact that using the mind map as an instrument helps students organize their thoughts to learn the material in a highly specialized manner and to better understand concepts (Buzan, 2005; Stokhof, Vries, Bastiaens, & Martens, 2020; Borovková, 2014; Srihandayani & Marlina, 2019). Because mind map depicts a particular subject in a nonlinear way and includes images and colours, this activity can also appeal to students whose learning styles aren't as well-suited to conventional linear, text-based materials. (Budd, 2004). Buran and Filyukov (2015) investigated the use of the mind-mapping method in technical students' language acquisition. The open-ended character of mind maps, as noted by R. Hanewald (2012), gave students greater influence over their instruction. According to research conducted by Stankovic et al. (2011) on the effectiveness of using mind maps in the classroom, using mind maps to organize knowledge and give students fast access to interpretation motivated them to study more. Buchatska (2016) used observational and opinion-based research to examine the psychological underpinnings of mind-map techniques used in English instruction. According to his findings, mind map is an incredibly effective and profound teaching tool that can be used to assist students in creating ideas for any subject, thinking creatively, and functioning cognitively at a high level.

2.3 English Speaking Anxiety (ESA)

Horwitz et al. (1986) defined language anxiety as the combination of test anxiety, Communicative Anxiety and Fear of Negative Evaluation. "A type of shyness characterized by fear of or anxiety about communicating with people" (Horwitz et al., 1986, p. 127) and the learner's unwillingness to talk are two definitions of communication apprehension in language acquisition (Cabansag, 2020). Aida (1994) considered foreign language anxiety to be the apprehension and fear of self-consciousness, beliefs, feelings, and behaviours apparent concerning language learning in the classroom that characterizes the learning process. Macintyre and Gardner (1994) considered foreign language anxiety to be a sense of tension and trepidation in which the individual learner has a special relationship with the foreign language context. Speaking is the most crucial of the many foreign language skills for classroom interaction, and because it is immediately evaluated by the public, it is also the skill that is most likely to make learners anxious (Horwitz et al., 1986; Young, 1991; Aida, 1994; Matsuda & Gobel, 2004; Lv, 2010). Horwitz et al. (1986) created the Foreign Language Classroom Anxiety Scale and used it in empirical research. The findings revealed that students with high levels of foreign language anxiety had low levels of proficiency in learning the language; in other words, the level of foreign language anxiety is negatively correlated with the efficacy of learning the language. Liu and Jackson (2008) looked into the fear and reluctance to speak among Chinese first-year undergraduates who aren't majoring in English. The majority of students in China worry about English speaking anxiety (Li, 2016). According to Rafada and Madini (2017), this concern typically arises when students do not adequately prepare for what they want to say when speaking in English. The mind map is one tactic that can be utilized to lessen the anxiety associated with public speaking, according to Sugiarto's idea (Suryani, 2015). Other factors that contribute to EFL speaking anxiety include pronunciation, quick inquiries, mistakes-related concerns, and negative feedback (Çağatay, 2015).

Chinese domestic research on the relationship between foreign language anxiety and English Speaking began in the 1990s. However, fewer studies have been conducted on students in Chinese higher vocational colleges.

Cheng et al. (2007) conducted a study on foreign language anxiety with 76 undergraduates as the research subjects and the results proved that university students' oral expression in English is indeed affected by classroom anxiety, and the higher the anxiety level is, the worse the oral expression in English is. Huang (2003) investigated 350 students in eight middle schools in three cities in Guangdong Province and also found the characteristics of foreign language anxiety among middle school students in the learning environment of English as a foreign language rather than a second language in China.

Based on the selection and admission process of the China National College Entrance Examination (*Gaokao*), Chinese higher vocational college students have a lower overall learning level than university students. Students in rural areas attend the seventh grade before they receive their first exposure to the English language due to regional economic and development reasons. Since English is a foreign language and not a second language in China, teachers and students lack the opportunities and contexts for speaking and practising the language. Higher vocational college English instruction in China still relies on centralized class lectures without employing hierarchical teaching methods. Some higher vocational colleges place an excessive amount of emphasis on major courses and disregard college English and language as unimportant public courses (Li, 2016). Due to the limitations of the school's infrastructure and the teachers' abilities, a large mixed classroom still primarily follows textbooks and cannot provide one-on-one speaking instruction for students. Students do not have the opportunity to practice their English after class because there is neither a setting nor an opportunity for them to do so. When they need to speak in English, it is easy to startle them and cause them psychological anxiety.

Speaking is the component of learning a foreign language that is most likely to cause anxiety among the 4 components of speaking, listening, reading and writing according to numerous research (Yang, 2005). Jin and Yang (2011) conducted classroom teaching experiments to improve speaking ability and reduce speaking anxiety and discovered that classroom training has a significant effect on reducing learners' speaking anxiety; Cheng and He (2007) proposed that the communicative teaching method can help alleviate speaking anxiety. Project-based learning encourages student collaboration and the teacher simply serves as a guide or class training while the project is being completed (Greenier, 2020).

3. Research Methodology

This study employs both qualitative and quantitative research methods. Twenty students majoring in preschool education from the School of Education at one of the public higher vocational colleges in Shaanxi province, China (abbreviated as the College) are chosen to be the experimental group, while the other 20 students with the same major who are not enrolled in the same class are the control group. The experimental group's students are divided into 4 sub-groups, referred to as sub-groups 1, 2, 3, and 4, and they are required to implement the project with the theme "Welcome to the Foreign Cafeteria" and design and complete four English sub-projects through grouping and teamwork for four weeks.

Before the project begins, a questionnaire consisting of 33 items on the widely accepted Foreign Language Classroom Anxiety Measurement Scale (FLCAS) is given to the experimental group and control group at the same time. From these answers, the data values for each student's anxiety are obtained and used as the starting points for the experiment. Following the project's completion, students are measured again by using the Foreign Language Classroom Anxiety Scale (FLCAS). The students' anxiety scores for pre-project and post-project are compared using SPSS software to see if the experimental group students' English anxiety levels have dropped throughout the whole project. Simultaneously, 6 students in the experimental group participated in semi-structured interviews to get an honest discussion about their opinions on Mind Map integrated Project-Based Learning on this project.

The College chosen is one of the public higher vocational colleges in northwest China's Shaanxi province. According to data from the college enrolment office, there are now 60% of rural students, and their English exam scores are poor. Figure 1 displays the outcomes of 150 students from three classes who took the College Entrance Examination on a full scale of 100.

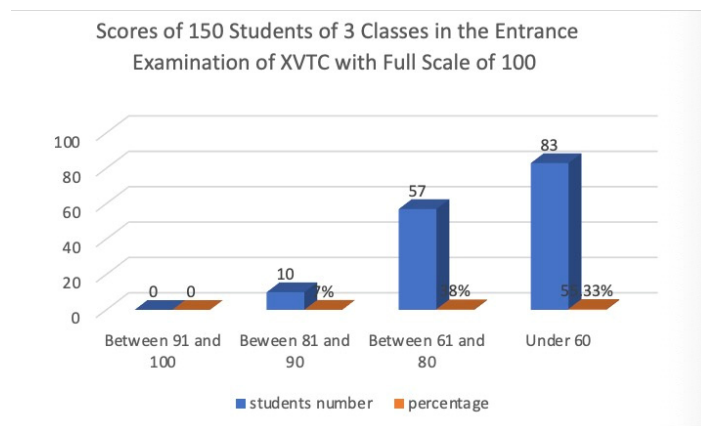


Figure 1. Scores of 150 students of 3 classes in the Entrance Examination of the college with a full scale of 100

4. Research Design and Procedure

4.1 Participants

Twenty freshman students from the College's School of English Education who are majoring in preschool education are selected for the study to serve as an experimental group. 20 other students with the same majors who are enrolled in different classes with the same English teacher make up the control group. They are chosen for this study since preschool majors make up the majority of College students and roughly half of the total enrollment. They range in age from 19 to 21. As mentioned above, six students from the experimental group are chosen at random to participate in semi-structured interviews.

Horwitz's Foreign Language Classroom Anxiety Scale (FLCAS) is employed as the Speaking Anxiety Scale in the study. Each question is followed by a list of five responses using the Likert Scale, including A. Strongly agree, B. agree, C. reluctantly agree, D. disagree, E. Strongly disagree. A receives a 1 point, followed by B and E with scores of 2 and 5 points, respectively. The anxiety value is calculated by adding the scores from each of the 33 categories. This study distributed 80 questionnaires, and 80 valid questionnaires were returned, giving it a 100% validity rate.

4.2 Duration

The project is carried out within 4 weeks.

4.3 Collecting and Analyzing Data

The information gathered for this study is divided into two categories: the quantitative information, which is obtained through two surveys on speaking anxiety conducted before and after the project and yielded a total of 80 valid questionnaires from both the experimental group and the control group, and the qualitative information, which is obtained through semi-structured interviews with six students randomly selected from the experimental group. Before the project starts, a total of 40 questionnaires are distributed to the experimental group and the control group; they are filled out right away, and then collected. The recovery rate is 100 percent. The project then starts for 4 weeks on the experimental group. Another survey of the experimental and control groups will be conducted following the project. After the project, data will be collected. All of the collected quantitative data are statistically analyzed using SPSS 27.0, while the collected qualitative data are analyzed using semantic analysis.

4.4 Procedure of English Project in the College Campus Cafeteria

After survey data has been collected, SPSS is used to assess the reliability and validity of the speaking anxiety questionnaire. Finally, 6 students are chosen from the survey respondents to engage in the semi-structured interviews. The independent paired t-tests are then utilized to analyze how the groups differed in terms of their speaking anxiety levels before and after the project.

The Mind Map Integrated Project-based Learning Project is collaboratively implemented by the College's School of Education and the cafeteria on campus. Before the project begins, the FLCAS (Foreign Language Language Classroom Anxiety Scale) is administered to both the experimental and the control group. During the project's four-week execution, which is divided into four sub-projects and eight tertiary tasks, students will complete two of them each week. In Week 1, students from subgroup 1 are required to compose and practice

dialogues about food in English as well as learn terms associated with food; In Week 2, Students from subgroup 2 are required to design, choose, and prepare a menu in both Chinese and English language as well as speak with foreign teachers and international students in English to discuss and learn about various country cuisines; In Week 3, sub-group 3 students are required to do a one-week dining field trip to serve as staff in the cafeteria and to create a poster showcasing the campus food in both Chinese and English. In Week 4, students from sub-group 4 are expected to make and shoot a short film featuring Chinese-English cuisine from the school cafeteria. Following its publication on the college's official website, information regarding the number of views and comments, the comments' content, and the evaluation of the English language proficiency of instructors, international students, and classroom teachers should be gathered and examined. In all the sub-projects, all the students in the experimental group use Mind Map as a technique to design, analyze and implement their sub-projects.

4.5 Conduct of Semi-Structured Interviews

Following the questionnaire, there are some questions and students interviews. The information from the interviews is used to examine whether or not Mind Map Integrated Project-based Learning could benefit students who felt anxious when speaking in front of audiences.

5. Findings and Discussion

5.1 Pre-Project Analysis

Before the project experiment, the Foreign Language Speaking Anxiety Questionnaire was given to both the experimental and the control groups at the same time. The independent samples t-test was used to examine the information from the two groups. According to Table 1, neither the mean values before the project started nor the mean values for the overall anxiety value significantly varied between the two groups. There is no noticeable difference between the two groups in terms of their mean values for each category and their overall speaking anxiety scores (p -value > 0.05). Overall, the anxiety level of the two groups of students speaking foreign languages is moderate ($M = 3.278$), and in terms of the anxiety factors, the Fear of Negative Evaluation value is the highest ($M = 3.395$), indicating that the students are very unconfident about their speaking ability and teachers' and peers' evaluations affect students' learning emotions and self-perception.

Table 1. Pre-project statistics on anxiety values of foreign language speaking for preschool education students

Anxiety Factors	Control Group (N = 20)		Experimental Group (N = 20)		T	P	Two Groups (N = 40)	
	Mean (M)	Standard Deviation	Mean(M)	Standard Deviation			Mean (M)	Standard Deviation
Overall Speaking Anxiety	3.310	0.553	3.236	0.509	0.619	0.540	3.278	0.530
Communication	3.245	0.555	3.142	0.549	0.797	0.428	3.194	0.552
Apprehension								
Test Anxiety	3.290	0.653	3.254	0.629	0.180	0.860	3.278	0.639
Fear of Negative Evaluation	3.429	0.620	3.370	0.505	0.433	0.668	3.395	0.565

5.2 Post-Project Analysis

After the project, the post-experimental anxiety data of the two groups of students were then subjected to an independent samples t-test, and the results revealed that the experimental group students had significantly lower overall speaking anxiety scores than the control group students ($p = 0.000$). In terms of anxiety-related variables, there was no statistically significant difference in test anxiety scores between the two student groups ($p = 0.315$), however, there were considerably lower levels of Communicative Anxiety and Fear of Negative Evaluation anxiety in the experimental group than in the control group.

Table 2. Pre-project and Post-project statistics on anxiety values of foreign language speaking

Anxiety Factors	Experimental Group (N = 20)		Std Deviation	T	P	Control Group (N = 20)		Standard Deviation	T	P
	Pre-test	Post-test				Mean (M)	Std Deviation			
	Overall Speaking Anxiety	3.239				2.690	0.178			
Communication Apprehension	3.146	2.552	0.231	15.587	0.000	3.245	0.555	0.135	1.293	0.203
Test Anxiety	3.266	3.099	0.328	3.128	0.003	3.290	0.653	0.203	1.867	0.071
Fear of Negative Evaluation	3.371	2.7738	0.247	15.978	0.000	3.429	0.620	0.156	1.553	0.130

5.3 Semi-Structured Interview Analysis

Six of the students in the experimental group participated in a semi-structured interview after the project. Using the students' own words as a guide, the measurements and semi-structured interviews with six students revealed that all of the students felt that the project's conception, participation, and completion had improved their English, particularly their speaking skills, their self-confidence in speaking English, and to some extent, their anxiety in speaking English had decreased and weakened. "I feel like I've grown braver and more confident speaking English thanks to the English Food Project." "My vocabulary has increased and speaking English no longer makes me anxious or stuck in my thoughts". "I've finally realized how useful English is!"

6. Conclusion

This study focuses on the implementation of Mind Map integrated Project Based Learning (PjBL) strategy in public English instruction at one of the Chinese higher vocational colleges. Specifically, the study designed an English project on food with the theme "Welcome to the Campus Cafeteria" to offer English language assistance to foreign teachers and international students at the College. The experimental students were given four sub-projects including designing an English language food poster, filming an English language food video, translating a Chinese menu to an English one and ordering and selling food in the English language using mind map as a technique. Students can choose the best types of mind maps collaboratively for the project. The study involved the selection of 40 freshman students majoring in preschool education. 20 are in the control group and the other 20 are in the experiment group. The two groups of students' English speaking anxiety was assessed before and after the project using the FLCAS scale, along with semi-structured interviews with six of the participants. The results of data analysis demonstrated Mind Map integrated Project-Based Learning (PjBL) can effectively reduce Chinese higher vocational college students' English Speaking anxiety.

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Authors contributions

Zhinan Li and Dr. Samah Ali Mohsen Mofreh were responsible for study design and revising. Chen Jiao was responsible for data collection. Zhinan Li drafted the manuscript and Aihua Zhu revised it. All authors read and approved the final manuscript.

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Obtained.

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Data sharing statement

No additional data are available.

Reference

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