

## The Effect of CLIL Implementation on Students' Development of English Reading Performance: An Empirical Study of Undergraduate Students in China

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### ABSTRACT

Previous research has found that content and language integrated learning (CLIL) is an effective method to improve undergraduate students' English reading performance. Little is known, however, about the underlying mechanisms of such this association or factors that might strengthen or weaken these processes. Therefore, based on the framework of action research, the current study aimed to fill this gap by scrutinizing the changes in and effects of academic vocabulary size (AVS), academic self-efficacy (ASE), and learning motivation (LM) on English reading performance over a 16-week semester. A total of 202 Chinese undergraduate students (majoring in English Education) participated in this study. The results revealed the following major findings: (1) students' AVS, ASE, LM, and English reading performance were significantly improved through CLIL implementation during this semester, (2) AVS, ASE, LM, and English reading performance were positively related to each other, (3) AVS significantly predicted students' English reading performance, (4) ASE and LM partially mediated the effect of AVS on English reading performance. These findings contribute to the understanding of the impact of CLIL on English reading performance. Limitations and implications for educational practices are discussed.

**Key words:** CLIL Implementation, English Reading Performance, Academic Vocabulary Size, Academic Self-Efficacy, Learning Motivation

### INTRODUCTION

Reading is regarded as a visual skill of extracting information and understanding the meaning of the written material (Radner et al., 2002). And a growing number of textbooks, lecture notes, and other teaching materials are written in English (Van Weijen et al., 2012). Therefore, the potential factors that may influence English reading performance have been investigated by many researchers (Gottardo et al., 2001; Gu, 2020). English reading performance has profound impacts on college students' learning and scientific research (Liu, 2021). However, there are still many students in higher education institutes who are unable to grasp a large number of academic materials efficiently (Trudell, 2019). Recent studies in China found that many of the current English reading instructions cannot achieve expected outcomes (He, 2021), and some students suffered from reading dyslexia, consequently reducing their learning interests (Pan, 2020).

Currently, language educators proposed various educational initiatives and one of them is Content and Language Integrated Learning (CLIL), which is a teaching method integrating content into language (Cenoz et al., 2014). Recent research has shown the effectiveness of CLIL education on learners' language development (Jafarigohar et al., 2022). However, most of these studies have not tested the potential predictors

and underlying mechanisms of achieving such improvement. Therefore, the present study developed a CLIL implementation to investigate the effects of academic vocabulary size (AVS), academic self-efficacy (ASE), and learning motivation (LM) on English reading performance over a 16-week semester and aimed to address the following research questions:

- (1) How do students' AVS, ASE, LM, and English reading performance change over the 16-week CLIL implementation?
- (2) How do students' AVS, ASE, LM, and English reading performance correlated with each other?
- (3) How does students' AVS affect students' English reading performance?
- (4) How do ASE, and LM mediate AVS's effects on students' English reading performance?

### LITERATURE REVIEW

#### Content and Language Integrated Learning

As an innovative teaching method, Content and Language Integrated Learning has been investigated by some researchers, producing numerous concepts and theories (Olsson, 2015; Swain and Lapkin, 2013). Since CLIL can be conducted in various ways, it is regarded as an umbrella term. However,

CLIL usually refers to an educational method that integrates language and content to improve students' language competence and specialized knowledge simultaneously (Le and Nguyen, 2022). Recent studies have shown that, in a CLIL context, both teachers and students put emphasis on content studies rather than language expressions (Genesee & Lindholm-Leary, 2013; Lyster, 2007).

Coyle (2007) describes the 4Cs framework to illustrate the core of CLIL theories. The 4Cs framework is composed of content, communication, cognition, and culture. To be specific, content refers to subject matters students acquired; communication refers to learners' interaction with others in learning activities; cognition refers to the thinking process that is essential during the process of finishing tasks; and culture refers to all the social awareness reflected in the language. In comparison with the traditional language teaching method, CLIL can provide students more substantial time exposed to the second language since L2 is used as the medium of teaching other subjects rather than only in English classes (Olsson, 2021). The L2 will become the tool to communicate while doing different tasks (Genesee & Lindholm-Leary, 2013). Recently, CLIL has been developed and implemented in a wide range of fields, including chemistry, engineering, history, math, and physical education (Tsang, 2020; Akbarov et al., 2018; Pancheva & Antov, 2017; Coral & Lleixà, 2016; Wannagat, 2007). In addition, research in the domain of language education has achieved some satisfactory results, and some studies have suggested that CLIL can improve learners' learning motivation (Karimi et al., 2019) and academic self-efficacy (Ohlberger & Wegner, 2019) for foreign language learning. For example, Jafarigohar et al. (2022) explored the effects of CLIL on 110 Iranian primary school students' English vocabulary growth. The results indicated that more significant growth in receptive and productive vocabulary can be found in the CLIL group.

### **Academic Vocabulary Size**

Vocabulary is not only the building block of human language, but also an essential component of people's development (David, 2008), and vocabulary size refers to the number of words of which a person had mastered at least the superficial or basic information (Qian, 2002). Previous studies indicated that there were certain thresholds of academic vocabulary size (AVS) which had significant impacts on learners' understanding of reading materials and use of language. For instance, learners who grasped the most frequently used 3,000 word families can understand 95% of words in reading materials (Nation, 2006). About 8,000 to 9,000 words may be required to achieve adequate lexical coverage of reading materials produced by native speakers (Nation, 2006; Schmitt, 2008). Thus, AVS plays a critical role in learners' English reading performance, which has been confirmed by researchers (Ibrahim, 2016; Laufer, 1996). Small AVS would hinder the learner's understanding of the meaning of reading materials (Moghadam, 2012). Students who have larger AVS are more likely to have stronger decoding and understanding ability, thus resulting better English reading performance. However, in China, researchers have

found that a large number of students' English reading performance cannot be effectively improved by vocabulary teaching since their interests and enthusiasm cannot be motivated (Wang, 2020; Xing, 2021).

### **Academic Self-Efficacy**

Academic self-efficacy (ASE) is a key element in Social Cognitive Theory and defined as an individual's beliefs, judgments, or subjective self-feeling about to what extent that he could finish the behaviors before taking actions (Bandura, 1986). Previous studies have indicated that ASE might have mediating effects on the relationship between AVS and English reading performance. According to Bandura (1989) and Yancey (2014), students with high ASE usually set higher personal goals and they will spare no efforts to achieve the goals they have established. The stronger the ASE a student possesses, the higher the personal goals he or she will set, which accordingly requires stronger ASE to keep motivated to complete the task. In contrast, low ASE would have adverse impacts on students' learning (Schunk, 2003). Students who have higher AVS usually have greater confidence in their reading ability, and show stronger ASE (Ma & Lin, 2015; De Bree & Zee, 2020).

### **Learning Motivation**

Learning motivation (LM) refers to a kind of motivational tendency that stimulates and maintains student's learning behaviors and then guides them to some academic objectives (Parsons et al., 2001). Many studies have suggested that LM is one of the most key and important factors that influence the learners' performance (Sung, 2013; Isiguzel, 2014), English reading performance in particular. Students with high motivation for reading are more likely to invest more time and effort in reading and eventually realize an improvement in reading ability (Schaffner et al., 2013). Previous studies have revealed that there is a significant positive relationship between AVS and students' LM (Ma & Lin, 2015; Alqahtani, 2020). To be specific, students with higher AVS tend to display stronger LM, which can exert a positive effect on their English reading performance. In contrast, students who master less AVS could have lower interests and enthusiasm, and consequently, have lower LM. About eighty percent of Chinese students lack enough LM and perceive the purpose of English learning as passing the exam, which leads to poor English reading performance (Yang, 2011; He, 2021).

## **METHODOLOGY**

### **Participants**

A total of 202 undergraduate students, majoring in English Education, participated in the present study, who were from eight CLIL classes in a foreign language university in Shaoxing, a city situated in southeast China. Among the sample, 105 (51.98%) were second-year students and 97 (48.02%) were third-year students. About 70% of respondents were from Zhejiang province, while the rest of them had come from

others provinces of China (the majority from Jiangsu, Anhui, and Fujian). They were heterogeneous concerning gender, with 25 male (12.38%) and 177 female (87.62%) students.

## Measures

### *Academic vocabulary test*

AVS was measured through the Academic Vocabulary Test (AVT) compiled by Diane Pecorari, Philip Shaw, and Hans Malmstrom (2019). The AVT has 19 items with three correct options each. Students can get two marks for each correct option and therefore the maximum mark of the AVT is 114. This scale demonstrated good internal reliability in the present study (Cronbach  $\alpha = 0.85$ ).

### *Academic self-efficacy scale*

The eleven items ASE scale with three factors was adapted from the original scales created by Gaudiano and Herbert (2013) and Owen and Froman (1988) to fit the English context. These three factors were: 4 items reflective of social skills (SS), 4 items indicative of cognitive operation (CO), and 3 items suggestive of affective coping (AC). A sample item was, "I am confident to ask a professor in class to review a concept I don't understand." Students responded on a 5-point Likert-type scale ranging from 1 (very unconfident) to 5 (very confident). This scale demonstrated good internal reliability in the present study (Cronbach  $\alpha = 0.90$ ).

### *Learning motivation scale*

LM was assessed by employing LM Scale with two factors, which contained ten items and was originally developed by Gardner (1985). The two factors were: 6 items reflective of integrative motivation (ITM) and 4 items concerned with instrumental motivation (ISM). And then the scale had been adapted to fit the English context. A sample item was, "Studying English is important to me because I can understand their culture and tradition." Students indicated their level of agreement within 1 (strongly disagree) to 5 (strongly agree) range. This scale demonstrated satisfactory internal reliability in the present study (Cronbach  $\alpha = 0.88$ ).

### *CET-6 (English reading section)*

CET-6 (English Reading Section) is an authoritative English language test in China with millions of test-takers every year. This test requires test-takers should be able to understand texts from English magazines and other English materials with proper reading strategies. The student's English reading performance was assessed twice by the mock test of CET-6 (English Reading Section) organized by the College of English Studies at both the pre-CLIL stage and post-CLIL stage. The score range of CET-6 (English Reading Section) is 0-249.

## CLIL Implementation Design

In the eight CLIL classes, the CLIL implementation are implemented for a 16-week semester. As shown in table 1,

**Table 1.** Overview of CLIL classes in two grades

Grade	CLIL Courses	English Courses
The second-year	<ul style="list-style-type: none"> <li>• Pedagogy</li> <li>• Second Language Acquisition</li> <li>• English Teaching Methodology</li> </ul>	<ul style="list-style-type: none"> <li>• Integrated English</li> </ul>
The third-year	<ul style="list-style-type: none"> <li>• Educational Psychology</li> <li>• Language Testing</li> <li>• Introduction to Linguistics</li> </ul>	<ul style="list-style-type: none"> <li>• Advanced English</li> </ul>

English Education students have various compulsory courses. *Pedagogy*, *Second Language Acquisition*, and *Introduction to Linguistics* are designed for second-year students, and *Educational Psychology*, *Language Testing*, and *Socio-linguistics* are taught for third-year students. English is the language of instruction for all these subjects. Furthermore, both second-year students and third-year students need to take the regular *Integrated English* and *Advanced English* training programs for three to four hours per week.

Taking *English Teaching Methodology* course as an example, this study showed the design of CLIL implementation. At the beginning of the first lesson, an English teaching method with its definition, concepts, advantages, disadvantages and relevant knowledge would be introduced by the professor. In this process, English is the only language of expression. Then, several selected teaching videos (in English) about this teaching method were played, and the professor would explain some key points if necessary. After that, the students should form a team of 4-5 people to exchange views on the teaching content. The tasks after group discussion need to be completed by students independently. They need to design a detailed teaching plan according to the previous activities and apply this teaching method in the process of their own teaching. In the next class, several students were randomly chosen to give a trial teaching in front of the class, and the professor could offer some professional suggestions to them. It should be pointed out that English was used in all teaching and learning activities, including language of instructions, language of teaching materials, language of discussion and others. Table 2 demonstrates the design of CLIL applications in *English Teaching Methodology* for a whole academic semester.

## Data Collection and Analysis

After the research design was approved by the Research Ethics Committee of the University, the data were collected at both pre-CLIL stage and post-CLIL stage over a 16-week semester. Then, mean, standard deviation, and paired samples t-tests were used to examine the changes in AVS, ASE, LM, and English reading performance at pre-CLIL and post-CLIL stages respectively. Pearson correlation analyses were run to investigate the correlations among all variables. After that, multiple regression analyses were conducted to scrutinize the effects of AVS, ASE, and LM on English reading performance.

Finally, a three-step procedure was conducted to examine the two mediation models of ASE and LM in the relationship

**Table 2.** Design of CLIL applications in english teaching methodology

Lesson	Step	Content	Participants	Period	Data Collection
1 <sup>st</sup> (1hours)	1	Introducing Theory	202 (100%)	1 September, 2021 To 15 January, 2022	
	2	Case Study	202 (100%)	1 September, 2021 To 15 January, 2022	
	3	Group Discussion	202 (100%)	1 September, 2021 To 15 January, 2022	
	4	Individual Design	202 (100%)	1 September, 2021 To 15 January, 2022	
2 <sup>nd</sup> (1hours)	5	Trial Teaching & Advice	202 (100%)	1 September, 2021 To 15 January, 2022	
	6	Reviewing	202 (100%)	1 September, 2021 To 15 January, 2022	

English was used in all teaching and learning activities

between AVS and English reading performance according to on the templates of pre-programmed models in PROSS macro. First, in order to test the first mediation model, the bootstrapping method was employed with PROCESS macro (model 4) to calculate the 95% confidence intervals with 5,000 resamples. After controlling for gender, model 1 was developed to analyze the mediating effect of ASE in the relation between AVS and English reading performance. Indirect path coefficients, of which the 95% confidence interval

does not include zero, are considered statistically significant. Second, in order to test the second mediation model, the bootstrapping method was employed with PROCESS macro (model 4) to calculate the 95% confidence intervals with 5,000 resamples. After controlling for gender, model 2 was developed to analyze the mediating effect of LM in the relation between AVS and English reading performance. Indirect path coefficients, of which the 95% confidence interval does not include zero, are considered statistically significant.

## FINDINGS

### Changes in AVS, ASE, LM and English Reading Performance

As shown in Table 3, the students scored 66.86 in pre-CLIL stage and 74.29 in post-CLIL stage on AVS, which indicates that the learners acquired plenty of academic vocabulary through CILI implementation for four months. Similarly, they scored 8.83-11.52 in pre-CLIL stage and 10.23-13.38 in post-CLIL stage on ASE scales, which means that the participants became more positive about their abilities to study under anxious situations (SS), held more positive beliefs toward their capacities to gain academic achievement (CO), and believed they had better skills to tackle distressing emotions while learning English (AC) through CLIL implementation for a whole semester. Furthermore, they scored 14.63 to 21.48 in pre-CLIL stage and 15.51 to 22.36 in post-CLIL stage on LM scales, which implies that the students had stronger interests in English learning and were willing to engage into the culture of the language they were learning (ITM), and were more likely to learn English to gain benefits such as searching for foreign language materials (ISM).

In addition, they scored 169.41 in pre-CLIL stage and 178.22 in post-CLIL stage on the English reading section of the CET-6 English test, which shows that the participants' English reading performance had been significantly improved through CILI implementation. As seen from Table 2, the students tended to score higher on AVS, ASE, LM, and English reading performance in post-CLIL stage. Besides, there are statistically significant differences occurred in all variables, which can be seen from the paired samples t-test results reported in Table 2. In other words, the learners' AVS, ASE, LM, and English reading performance were significantly enhanced through CLIL implementation for 4 months.

### Correlation Analyses Between AVS, ASE, LM and English Reading Performance

Pearson correlations analyses for the main variables are shown in Table 4. It is obvious that AVS, ASE (SS, CO, and

**Table 3.** Means, standard deviations, and paired sample t-test results at pre-CLIL and post-CLIL stages

Variables	Pre-CLIL		Post-CLIL		Paired sample t-test results	
	Mean	SD	Mean	SD	t	P
AVS	66.86	14.798	74.29	14.096	5.164	0.000
SS	11.46	2.128	13.38	2.495	8.346	0.000
CO	11.52	2.052	13.26	2.480	7.672	0.000
AC	8.83	1.837	10.23	1.984	7.337	0.000
ITM	21.48	4.155	22.36	4.030	2.176	0.030
ISM	14.63	2.763	15.51	2.919	3.116	0.002
CET-6 (ERS)	169.41	24.537	178.22	22.397	3.768	0.000

AVS, academic vocabulary size; SS, social skills; CO, cognitive operation; AC, affective coping; ITM, integrative motivation; ISM, instrumental motivation; CET-6 (ERS), CET-6 (English Reading Section)

AC), LM (ITM and ISM), and English reading performance were positively correlated with each other. In addition, gender was found to have no significant relation with AVS, ASE, LM, and English reading performance.

### The Effects of AVS, ASE and LM on English Reading Performance

To examine the effects of AVS on English reading performance, multiple stepwise regression analyses were conducted four times, with English reading performance as the dependent variable, AVS as independent variables the first time, AVS and ASE as independent variables the second time, AVS and LM as independent variables the third time. The results are summarized in Tables 5, 6, 7.

As shown in Table 5, when AVS was used as an independent variable, AVS was a powerful predictor for English reading performance, with AVS being a positive ( $\beta = 0.504$ ,  $t = 11.703$ ,  $p = 0.000$ ) predictor. When AVS and ASE were used as independent variables, AVS and CO were powerful predictors for English reading performance. AVS ( $\beta = 0.416$ ,  $t = 8.330$ ,  $p = 0.000$ ), and CO ( $\beta = 0.168$ ,  $t = 3.355$ ,  $p = 0.001$ ) were positive predictors (see Table 6). As shown in Table 7, when AVS and LM were used as independent variables, AVS and ITM were powerful predictors for English reading performance. AVS ( $\beta = 0.457$ ,  $t = 10.344$ ,  $p = 0.000$ ), and ITM ( $\beta = 0.166$ ,  $t = 3.749$ ,  $p = 0.000$ ) proved to be powerful predictors for English reading performance.

### The Mediating Effects of ASE and LM Between AVS and English Reading Performance

To further test the mediation models, we respectively placed ASE and LM in the relation between AVS and English reading performance. The PROCESS macro was utilized to analyze the models 1 and 2 presented in Figure 1 and Figure 2.

The results of model 1 reveals that there is a positive significant effect of AVS on CO (path a;  $\beta = 0.525$ ,  $p < 0.001$ , 95% CI [0.72, 0.10]) and CO on English reading performance (path b;  $\beta = 0.168$ ,  $p < 0.001$ , 95% CI [0.68, 2.61]). The indirect effect was also significant ( $a \times b$ ;  $\beta = 0.088$ , 95% CI [0.51, 0.82]). Moreover, after we inserted CO into the relation between AVS and English reading performance, the direct effect remained significant (path c';  $\beta = 0.504$ , 95% CI [0.67, 0.94]), which indicated a partial mediation.

The results of model 2 reveals that there is a positive significant effect of AVS on ITM (path a;  $\beta = 0.283$ ,  $p < 0.001$ , 95% CI [0.05, 0.10]) and ITM on English reading performance (path b;  $\beta = 0.166$ ,  $p < 0.05$ , 95% CI [0.46, 1.47]). The indirect effect was also significant ( $a \times b$ ;  $\beta = 0.047$ , 95% CI [0.59, 0.87]). Moreover, after we inserted ITM into the relation between AVS and English reading performance, the direct effect remained significant (path c';  $\beta = 0.504$ , 95% CI [0.67, 0.94]), which indicated a partial mediation.

## DISCUSSION

The findings of the current research are as follows: first, CLIL had significant effects on enhancing learners' AVS,

**Table 4.** Correlations among the main variables

	1	2	3	4	5	6	7	8
1. Gender	-							
2. AVS	0.090	-						
3. SS	0.004	0.591***	-					
4. CO	-0.029	0.525***	0.770***	-				
5. AC	0.032	0.589***	0.682***	0.717***	-			
6. ITM	0.029	0.283***	0.344***	0.388***	0.397***	-		
7. ISM	0.058	0.231***	0.303***	0.328***	0.362***	0.843***	-	
8. CET 6 (ERS)	0.048	0.504***	0.385***	0.386***	0.332***	0.295***	0.222***	-

N = 404. Gender was codes as 1 = males; 2 = females. \*p < 0.05, \*\*p < 0.01, \*\*\*p < 0.001.

**Table 5.** Multiple regression coefficients and significance of predictors for english reading performance (AVS as independent variable)

	AVS
English reading performance: AVS as independent variable	
$\beta$	0.504
$t$	11.703
$p$	0.000
VIF	1.000
Cohen's $f^2$	0.254

\*\* $p \leq 0.01$ ; \* $p \leq 0.05$ ; effect size of Cohen's  $f^2$ : small,  $f^2 \leq 0.02$ ; medium,  $f^2 = 0.15$ ; large,  $f^2 \geq 0.35$  (Cohen, 1988)

**Table 6.** Multiple regression coefficients and significance of predictors for english reading performance (AVS and ASE as independent variables)

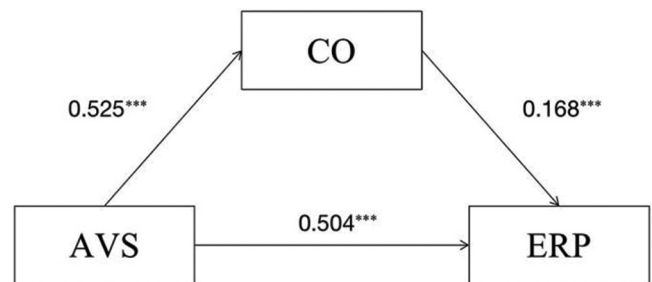
	AVS	CO
English reading performance: AVS and ASE as independent variables		
$\beta$	0.416	0.168
$t$	8.330	3.355
$p$	0.000	0.001
VIF	1.380	1.380
Cohen's $f^2$	0.274	0.274

\*\* $p \leq 0.01$ ; \* $p \leq 0.05$ ; effect size of Cohen's  $f^2$ : small,  $f^2 \leq 0.02$ ; medium,  $f^2 = 0.15$ ; large,  $f^2 \geq 0.35$  (Cohen, 1988)

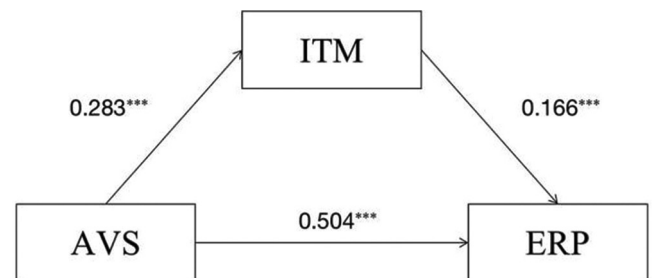
**Table 7.** Multiple regression coefficients and significance of predictors for english reading performance (AVS and LM as independent variables)

	AVS	ITM
English reading performance: AVS and LM as independent variables		
$\beta$	0.457	0.166
$t$	10.344	3.749
$p$	0.000	0.000
VIF	1.087	1.087
Cohen's $f^2$	0.279	0.279

\*\* $p \leq 0.01$ ; \* $p \leq 0.05$ ; effect size of Cohen's  $f^2$ : small,  $f^2 \leq 0.02$ ; medium,  $f^2 = 0.15$ ; large,  $f^2 \geq 0.35$  (Cohen, 1988)



**Figure 1.** The mediating model 1 after controlling for gender. AVS, academic vocabulary size; CO, cognitive operation; ERP, English reading performance. \*\*\*p < 0.001.



**Figure 2.** The mediating model 2 after controlling for gender. AVS, academic vocabulary size; ITM, integrative motivation; ERP, English reading performance. \*\*\*p < 0.001

ASE, LM, and English reading performance; second, AVS, ASE, LM, and English reading performance were highly positively related to one another; third, AVS significantly predicted learners' English reading performance; four, ASE and LM partially mediated AVS's effects on students' English reading performance.

In terms of the first question, the current research suggested that CLIL is a useful method for improving students' AVS, ASE, LM and English reading performance, which were consistent with previous research (Jafarigohar et al., 2022; Ohlberger & Wegner, 2019). This might be because CLIL can provide students with a real foreign language learning context. Students can naturally acquire L2 when they were learning and using specific subject knowledge throughout the whole class. Besides, implementing CLIL means students could finish various subject tasks based on L2 rather than practice language itself through man-made communication. In this case, students' language performance

can be effectively improved (Chumbay & Ochoa, 2020) and students' learning motivation and academic self-efficacy will be enhanced in the meantime (Chou, 2021).

The second research question sought to investigate the correlations among students' AVS, ASE, LM, and English reading performance. The results showed that AVS, ASE (SS, CO and AC), LM (ITM and ISM), and English reading performance were positively correlated with each other. This was in line with findings of other studies (e.g., Ibrahim, 2016; Yancey, 2014; Alqahtani, 2020).

With regard to the third questions, it was found that when working alone, AVS proved to be a powerful positive predictor for learners' English reading performance, which is consistent with previous studies (Rashidi & Khosravi, 2010; Zhang & Anual, 2008). Laufer (1992) points out that it is unlikely for readers with fewer than 5,000 lexical items to read well. However, if readers have 8,000 lexical items, they can achieve satisfactory L2 reading performance regardless of their general ability (Laufer, 1992). To be specific, enough academic vocabulary size can reduce the obstacles to a large degree during the reading process and help readers effectively understand the meaning and intention of the reading materials. On contrary, when readers encounter loads of unknown vocabulary in the reading process, he or she may have a negative about his or her reading ability, eventually presenting a poor English reading performance.

Finally, the fourth question aimed to test the mediating effects of ASE and LM on the association between AVS and English reading performance. The current research revealed that when working with academic self-efficacy, AVS and CO were found to significantly predict student's English reading performance, and CO could mediate AVS's effects on students' English reading performance, which supports the Social Cognitive Theory (Bandura, 1986), indicating academic vocabulary size may help to enhance learner's academic self-efficacy and further improve their English reading performance. However, SS and AC did not significantly predict the participants' English reading performance. This might be because although students hold the belief that they can learn under anxious situations or overcome negative emotions while learning English, this unnecessarily means they can achieve this in real situations.

Furthermore, when working with learning motivation, AVS and ITM were revealed to significantly predict students' English reading performance, and ITM could mediate AVS's effects on students' English reading performance, which is similar to previous studies. If students obtained enjoyment and get interest in the culture presented by foreign languages, their ITM for learning will be improved. However, the present research did not reveal that ISM was a predictor of the participants' English reading performance. This might be because some learners were indeed willing to learn English to gain benefits. However, they spared no efforts to learn, and thus their English performance would remain the same.

## CONCLUSION AND IMPLICATIONS

In summary, through CLIL implementation in a foreign language university in China for a 16-week semester, this study

provide a better understanding of the underlying mechanisms of CLIL on undergraduate students' English reading performance. The finding of the current study suggests that CLIL can effectively enhance learners' English reading performance, and this process might be strengthen or weaken by learners' AVS and affective factors such as ASE, and LM. According to the discoveries obtained in this research, some practical implications in the educational context can be proposed as below.

Firstly, while implementing CLIL activities, teachers should often reflect on their teaching activities and communicate with students about their feelings and opinions to figure out the underlying problems and resolve these issues (Zhou & Liu, 2020). Meanwhile, it is necessary to strengthen the class management and monitor students' learning process by means of many measures such as checking attendance and the length of online learning time to ensure students' class engagement (Xie, 2020).

In addition, teachers should teaching vocabulary in context (Pan & Xu, 2011). It is easier to learn vocabulary in context rather than the isolated word list because the meaningful context provides students with opportunities to process the information in a deeper way, which will facilitate vocabulary acquisition and memory.

Furthermore, the CLIL teaching activities should comply with the major sources of self-efficacy (Bandura, 1997). According to Bandura (1997), there are four sources of self-efficacy: personal experience, vicarious experience, verbal persuasion, and emotional and physiological states. Accordingly, teachers should set formative evaluations with medium difficulty and avoid the highly difficult problem. Then, teachers should share some successful cases with students regularly. In addition, teachers and parents should provide students with more encouragement and advice. Lastly, teachers and parents should pay more attention to monitoring students' physiological and emotional conditions.

The CLIL teaching activities ought to abide by the major sources of learning motivation. According to Touré-Tillery and Fishbach (2017), there are three major sources of motivation: obtainment of external rewards, obtainment of internal rewards, and maintenance of positive self-concept. Accordingly, teachers and parents can tell students that they will be rewarded if they made some achievement or improvement in learning. Besides, it is better to cultivate students' intrinsic interest and enthusiasm for learning. Finally, teachers should guide students to and make more internal attribution about their academic performance.

Even though the findings of this research are satisfactory, it can be better in several ways. Firstly, the data collected in the current study are from students' self-report, which could be problematic since self-report is subjective and it is likely to be affected by teachers' and parents' expectations. Therefore, multiple informants such as teachers' reports and parents' reports can be involved. Secondly, further research should be carried out to verify the findings in other context.

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