Noticing Collocation in Reading: A Multi-Case Study of Five Chinese EFL Learners

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Abstract
This study examines five Chinese EFL learners in a language institution regarding the effects of collocation noticing instructions in reading classes in terms of collocation competence and attitudes towards the noticing instructions. The data were collected from multiple sources, including vocabulary tests, pre/post collocation tests, in-class practice tests, questionnaire surveys, and semi-structured interviews. The analysis mainly focuses on two aspects: (1) the effectiveness of incorporating collocation learning into reading lessons, and (2) the learners' perception and attitude towards collocation noticing instructions. Data analysis shows that the reading intervention effectively raised learners' collocation awareness, and that learners showed mixed attitudes towards it. They deemed useful the collocation orientation and input-enhancement approaches, especially the one with Chinese glossary embedded into reading texts, but they found self-directed noticing challenging and meanwhile realized that collocations learned in reading are difficult to output in writing and speaking. Therefore, this research suggests that language teachers should integrate collocation teaching into the classroom as early as possible through various awareness-raising methods, so that the input and output of collocation learning are not separated.

1 Introduction

As an essential part of mastering a second language (L2), vocabulary learning has been increasingly emphasized in L2 classrooms. L2 learners, especially those who plan to study in English speaking universities, spend intensive amounts of time reciting English vocabulary. They may be familiar with the words *stark* and *contrast* respectively but failed to recognize *stark contrast* as a useful language unit because they did not store such a chunk in their lexicon. As the most important chunk of words, collocation has been suggested as the top priority of every language course (Lewis, 2000). In fact, collocation has received increasing attention not only from researchers but also from examining boards. Collocational knowledge has been recognized by examining boards as an important element in

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assessing a learner's overall language proficiency (Hargreaves, 2000) and has been recommended as a symbol of academic or language proficiency levels (Lien, 2003). *Online Collocation Dictionary* also suggested collocation learning as a part of preparation for IELTS and TOEFL (Freecollocation, n.d. para.1). Although the importance of collocation for language acquisition and exam preparation has been emphasized, L2 learners in China have been found to perform poorly in terms of collocation competence (Duan & Qin, 2012; Men, 2017; Xia, 2013; Yang, 2015; Zhou & Lü, 2010).

In order to determine effective ways to improve learners' collocation competence, studies on collocation teaching and learning have been conducted in recent years. While some reported that learners can learn collocations incidentally from reading (e.g., Macis, 2018; Vu & Peters, 2021), other studies argued convincingly that explicit collocation teaching benefits learners in their English skills (e.g., Boonyarattanasoontorn et al., 2020; Lakkham & Kulsirisawad, 2020; Ördem & Paker, 2016). No matter what kind of teaching and learning methods are used, the main problem regarding collocation learning is that learners do not notice collocations. The most important thing for teachers, other than worrying about the knowledge of collocation, is to shift students' attention away from individual words to chunks of language to raise their collocation awareness (Conzett, 2000). In this regard, there have been some studies on attention-drawing methods, and positive effects of visual input enhancement on collocation noticing and learning have been developed (e.g., Fakhrzadeh & Yazdanjoo, 2020; Goundarzi & Moini, 2012; Szudarski & Carter, 2016; Vu & Peters, 2021; Zhou & Lü, 2010). However, few studies have been conducted of instructional effects of a more complex collocation noticing which adopts several noticing instructions, and the attitude of individual learners towards noticing collocation through reading has not received adequate research attention.

In light of the above concerns, the researcher decided to incorporate basic collocation knowledge and two noticing methods into reading classes to explore whether and to what extent the reading intervention can raise learners' awareness of collocations, and to look deeply into individual learners' attitude towards noticing collocation instructions.

2 Literature Review

2.1 Collocation: Definition and classification

In literature, the definition and classification of collocation were understood differently. As for definition, collocation was first introduced by Firth (1957) as statements of habitual or customary places of a given word. It was then defined by Lewis (2000) as "the way in which words co-occur in natural text in statistically significant ways" (p. 132) and described by Nation (2001) as "closely structured groups whose parts frequently or uniquely occur together" (p. 324). As for the categorization of collocations, there are two approaches. One commonly adopted in literature is by Benson et al. (1986). According to them, two types of collocations are distinguished: grammatical collocation and lexical collocation. Grammatical collocation consists of a key word and a preposition or grammatical structure, such as *important to, refer to*. Lexical collocation, on the other hand, is made up of nouns, adjectives, verbs, or adverbs, such as *strong tea, heavy rain, stark contrast*. The most common lexical collocation types are:

1. Adjective-noun (e.g., *supporting details*)
2. Noun-verb (e.g., *situation arise*)
3. Verb-noun (e.g., *fulfill dreams*)
4. Verb-adverb (e.g., *differ widely*)
5. Adverb-adjective (e.g., *potentially misleading*)

While some lexical collocations, such as *strong tea* and *heavy rain*, are adjacent collocations, others are separated by either grammatical or lexical words, such as *learn a foreign language*, and are called split

collocations. According to Lackman (2011), split collocations should be noticed by students, especially those at advanced levels. Another approach is by strength, determined by the frequency of occurrence of the two main words and other words. Strong collocation, such as *torrential rain*, features words that do not appear in many other words, while weak collocation, such as *good book*, consists of words that appear along with many other words. The most important collocations for students are medium-strength collocations (Lackman, 2011), such as *supporting evidence* and *differ widely*. Regardless of how collocation was defined and categorized in the literature, "what is important in a teaching context is a definition that will make teaching and learning easier" (Lackman, 2011, p. 3).

2.2 Collocation: An often-neglected aspect in vocabulary learning

The fundamental importance of vocabulary teaching and learning has long been expressed by scholars. Wilkins (1972) pointed out that "Without grammar, little can be conveyed. Without vocabulary, nothing can be conveyed" (p.111). Meara (1980) stated that L2 learners identified vocabulary acquisition as their biggest problem once they passed the initial stages of second language acquisition. Vocabulary teaching and learning in China has always been accompanied by printed vocabulary books, which pair English words with their Chinese meanings. Language teachers present and explain the words through decontextualized activities in English classes, and learners are accustomed to the mechanical memorization of individual English words from the vocabulary lists with no contextual clues. Therefore, learning words in such a way does not result in effective learning; learners may know a fair number of individual words, but knowing a word is far more complex than just knowing the Chinese meaning of the word. One assumption of vocabulary teaching by Richards (1976) pointed out that "Knowing a word entails knowledge of the network of associations between that word and the other words in language" (as cited in Meara, 1996, p.1). Lewis (1993) in the book *The Lexical Approach* indicated that a major element of being able to use a word involves mastering its collocational knowledge. However, it was reported that learners "lack the ability to use those words in a range of collocations which pack more meaning into what they say or write" (Lewis, 2000, p.14). One major reason for the collocation incompetence is that collocation has been largely neglected by teachers and learners in English-as-a-foreign-language (EFL) classrooms as reported by researchers (Bahns & Eldaw, 1993; Farghal & Obiedat, 1995; Hashemi et al., 2012; Kweldju, 2015; Xia, 2013).

2.3 Collocation incompetence and the importance of collocation teaching

In addition to the negligence of collocation teaching in EFL classrooms, studies have indicated that shortage of collocation knowledge (Bahns & Eldaw, 1993; Farghal & Obiedat, 1995), complete unawareness of collocations (Barfield & Gyllstad, 2009; Ying & O'Neill, 2009), lack of exposure influences (Ginanti, 2020), and most importantly, lack of motivation of collocation learning (Chen, 2002; Ginanti, 2020), all play a part in collocation incompetence. Chinese L2 learners' knowledge of collocations was found to perform at a low level (Duan & Qin, 2012; Men, 2017; Xia, 2013; Yang, 2015). One study in particular (Yang, 2015) explored the challenge of collocation learning of Chinese learners and found that motivation, knowledge about collocation, and learners' metacognitive awareness of collocation learning influenced the Chinese learners' collocation competence.

To improve learners' collocation competence, ESL teachers have been advised to teach collocations in class. Mere exposure to collocations was insufficient for learners, especially those with high language proficiency, to acquire collocations, as explained by Marton (1977). Mackin (1978), however, claimed that teaching collocations was impossible because the number of collocations is "so numerous as to rule out any methodical teaching or acquisition of them" and the only way for learners to achieve a

certain degree of collocation is "years of study, reading, and observation of the language" (pp.150-151). In response to such a claim, there have been some studies on the teachability of collocations, and the effectiveness of explicit collocation teaching on collocation acquisition in L2 has been shown (e.g., Boonyarattanasoontorn et al, 2020; El-Dakhs et al., 2018; Khonamri et al, 2020; Lakkham & Kulsirisawad, 2020; Rahimi & Momeni, 2012). El-Dakhs et al. (2018), for example, compared the effectiveness of explicit teaching and incidental learning on 114 Arab elementary L2 English learners and found that explicit instruction was more effective in collocation learning in terms of recognition and recall. Boonyarattanasoontorn et al. (2020) conducted research on the effect of collocation teaching on 36 Thai undergraduate students majoring in English and discovered that explicit collocation teaching affected the improvement of collocation knowledge and the correct recognition and appropriate usage of collocations. Khonamri et al. (2020) also discovered that teaching English collocations to EFL learners and raising their awareness would enhance their proficiency in writing and improve their collocational competence. Such studies tend to show that explicit collocation teaching will improve the collocation competence and raise collocation awareness.

2.4 Incorporating collocation teaching into reading classes

Brown (1974) was one of the pioneers who proposed to incorporate collocation into the EFL classroom. He stated that that EFL learners will increase the collocation knowledge and improve their reading speed. Conzett (2000) also proposed to incorporate collocation teaching and learning into reading/writing classes so as to raise the awareness of collocations. By incorporating collocation teaching into reading/writing classes, teachers need not to alter the design of the textbooks or modify the curriculum, but to attract students' attention to collocations in the reading materials (Conzett, 2000). There have been some studies related to such proposals, and positive results have been revealed (e.g., Ördem & Paker, 2016; Yang & Jiang, 2014). Yang and Jiang (2014), for example, suggested that the purpose of incorporating collocation teaching into the reading/writing course is to raise students' awareness of collocations and thus to improve their production in the target language. In their research, students' active participation and enthusiasm for collocation learning reflected that the integration of collocation into the reading classroom can produce positive and encouraging effects on collocation learning. Ördem and Paker (2016) studied further the effectiveness of collocation teaching in a reading course on 60 participants and discovered that systematic weekly support for learners' progress in reading courses could improve collocation retention and usage in English reading comprehension. They thus concluded that systematic collocation teaching in reading was vital because randomly taught collocations may not be retrieved easily, and they also suggested that frequent recycle and review in collocation learning was also of great importance. Such research seems to come to an agreement that by incorporating collocation teaching into reading/writing classes, learners will notice collocations and thus improve their collocation retention as well as production. As collocation awareness is important to EFL students' language skills (Conzett, 2000; Zaabalawi & Gould, 2017), it has been suggested that the most important thing for teachers in the classroom is not just to teach the basic collocation knowledge but to raise students' attention to collocations (Conzett, 2000) and that deliberate attention should be paid to collocations, as they are difficult to learn incidentally (Boers et al., 2014).

2.5 Noticing collocation

Nothing can be learned from input unless noticing happens, according to Schmidt's noticing hypothesis (1995). Noticing is a low level of awareness, or a "conscious registration of the concurrence of some event" (Schmidt, 1995, p. 29), while understanding is a high level of awareness, or a "recognition of a general principle, rule, or pattern" (Schmidt, 1995, p. 29). For learning to occur, noticing is necessary

while understanding is not required (Schmidt, 1995). Noticing L2 features through wide exposure in reading is necessary and sufficient to convert input into intake, and it is also a link from input to memory system (Schmidt, 1995). Lewis (2000) proposes that noticing, a significant part of the lexical approach, can be a start point for collocation teaching. If learners are not instructed to notice language in a text, they may see through the text and thus achieve little intake (Lewis, 2000). To reinforce noticing, Lewis (2000) suggested using several activities, such as homework, cooperation, involvement, and motivation. Two more specific and systematic instructions of collocation noticing have been suggested in literature: A teacher-guided noticing and a self-directed noticing. Teachers can teach students the basic knowledge of collocation, such as the definition and type of collocation via using adapted textbooks (Conzett, 2000), and they can also use repetition and meaningful contexts to foster noticing (Kennedy, 2003). On the other hand, students can search collocations in a reading text to raise their collocation awareness (Hill, 2000; Lackman, 2011; Woolard, 2000). Compared with self-directed noticing, which could be quite challenging to learners who lack the cognitive resources to notice language patterns in the input (Laufer & Hulstijn, 2001), teacher-guided noticing has attracted attention, and positive results have been reported by researchers (e.g., Dorkchandra, 2015; Heidari, 2012; Shabani & Rahimy, 2020; Vu & Peters, 2021). For instance, Heidari (2012) investigated the effect of explicit teacher-guided noticing collocation by 30 college students in Iran and found that teacher-guided noticing had a significant role in learning collocations. Dorkchandra (2015) also looked into the effects of instruction of noticing collocation on 57 first year English major students and found positive results: the participants believed that collocation noticing instruction was interesting and conducive to English learning. He thus suggested that teachers should use at least 2-3 awareness-raising activities for the purpose of noticing collocation in the classroom. More recently, Vu and Peters (2021) investigated the effect of reading mode on collocation learning and discovered that reading with textual input enhancement resulted in significantly higher learning gains than the other reading modes.

2.6 Input enhancement

Input enhancement is defined as the process by which language input becomes salient to learners, and it can be used for aspects of a language that do not seem to have sufficient impact on learners (Smith, 1993). Visual input enhancement of a reading text, in which target forms are bold, underlined, capitalized, or italicized, has been proposed as a method to highlight the target language form in the input (Smith, 1993). Researchers (e.g., Fakhrzadeh & Yazdanjoo, 2020; Goundarzi & Moini, 2012; Shabani & Rahimy, 2020; Szudarski & Carter, 2016; Zhou & Lü, 2010) have studied visual input enhancement and found quite positive results. Zhou and Lü (2010), for example, studied the impact of input enhancement and task load involvement on collocation learning of 60 Chinese university freshmen and found that input enhancement played a major role in collocation acquisition and could supplement task load to increase the acquisition effects of the form and meaning of collocations. Goundarzi and Moini (2012) further studied the effectiveness of three input enhancement methods (bold collocations, L1 glossed collocations, and text-only collocations) on 60 second-year and third-year students at Iranian universities. The results showed that participants in L1 glossed group outperformed those in the other two groups, and participants in the bold group outperformed those in the non-highlighted (text-only) group. More recently, Shabani and Rahimy (2020) investigated comparatively the effect of two input enhancement methods (textual and audio) and skewed input on lexical collocation of intermediate EFL learners. It was revealed that textual glossing and skewing techniques resulted in greater improvement in lexical collocation. Webb and Nation (2017) in their book *How Vocabulary Is Learned* recommend using textual input enhancement and glossing as ways to notice collocations in reading. The logic behind input enhancement and glossing is that making visible and salient changes in the input is more eye-catching for learners. As long as learners can notice the collocations in reading texts, they will be more likely to pay attention to the target collocations, regardless of the noticing strategy.

3 Methodology

3.1 Research questions

Studies have shown that noticing collocation instruction, be it self-directed or teacher-guided, is conductive to collocation learning. However, what is lacking in the literature is the comparison of the effectiveness between teacher-guided collocation noticing and self-directed noticing for individual learners who take both methods at the same time. In addition, the attitude of individual learners, especially Chinese L2 learners with different English language proficiency and learning backgrounds, towards noticing instructions has not yet been fully understood and thus is worthy of research and analysis with detailed descriptions. Information of individual students and comments on individual differences are worthy of the attention of researchers, and significant differences could be found within individual learners (Meara, 1980). Considering this, a qualitative, multi-case study was designed to look closely at the impact of noticing instruction on individual learners' awareness of collocations via reading intervention. It attempts to fill two research gaps: (1) the effect of integrating the collocation orientation and noticing instructions into real-life reading classes, and (2) learners' attitude towards noticing instructions in reading intervention. The present study thus seeks to answer the following research questions:

1. To what extent does integrating collocation noticing instruction into reading classes raise learners' awareness of collocations in reading texts? (RQ1)

2. What is the learners' attitude towards the instruction of noticing collocation in reading classes? (RQ2)

3.2 Participants

The study was conducted in a small language training institution setting in Shenzhen, China, which provides students with one-on-one language training courses to prepare for exams such as TOEFL and ELTES. Five participants - Elly, Rachel, Renzo, Zhou, and Wen (all pseudonyms) - were recruited by using convenience sampling. There were two considerations. First, while greater depth could have been achieved by one or two learners, it was possible that the convenience selection of a single case might be less convincing than five cases. Second, five learners seemed to be a fair number of participants, who could be compared possibly with one another and handled adequately by the researcher. The detailed information about the five participants can be seen in Table 1.

Elly, a 29-year-old female, was a part time lawyer recently applying for a master's degree. Her working environment did not require English, so her only opportunity to learn and practice English was the once-a-week intensive study at the institution. Rachel, a 23-year-old female, is a third-year university student studying at an American university. Her learning environment is different from others; she needed to use English all the time, but she was so busy taking lectures and working on programs that she took online language courses once a week to prepare for TOEFL. Renzo, a 22-year-old male, was a senior college student majoring in music in a local university in Shenzhen, China. He barely used English at school, and like Elly, he came to the institution at weekends to study intensively. Zhou, a female, and Wen, a male, were both Grade 12 students applying for academic programs in English speaking universities. They took English classes during school and took language courses to prepare for TOEFL at the institution on weekends. To sum, the five participants were (1) at low to medium English proficiency level (based on the mock TOEFL test) and medium reading level (ranging from 15 to 21 on the mock reading test), and (2) with different studying modes but with the same aim to improve their reading ability.

Table 1

Basic Information of the Participants

Participant	Age	English proficiency level	Reading ability	Mode of English study
Elly	29	Medium	Medium	▪ Off-campus: in person intensive
Rachel	23	Low	Medium	▪ On-campus: in field
				▪ Off-campus: online
Renzo	22	Low	Medium	▪ Off-campus: in person intensive
Zhou	18	Low	Medium	▪ On-campus: supervised
				▪ Off-campus: in person intensive
Wen	18	Low	Medium	▪ On-campus: supervised
				▪ Off-campus: in person intensive

3.3 Instrument

3.3.1 Reading intervention

The main goal of reading classes in a tutorial environment is to improve learners' reading comprehension skills and TOEFL reading scores. Of all the sub-reading skills in the TOEFL reading section, vocabulary is an essential language ability. Therefore, vocabulary teaching is necessary in every TOEFL reading class. Unlike traditional vocabulary teaching, which only focuses on the meaning of individual words, the intervention in this study was to shift the learner's attention away from individual words and meaning and raise awareness of collocation. The six-week reading intervention was arranged in the last 30 minutes of each 120-minute reading class after reading comprehension. The reasons for this arrangement were as follows: (1) noticing collocation would be easier if learners have already understood the content of the reading, and (2) "collocations exist in students' L1, so it really is not difficult for them to understand the concept" (Conzett, 2000, p. 75). In the weekly thirty-minute reading intervention, three main tasks were arranged: collocation orientation, self-noticing, and teacher-guided noticing.

Task 1 was collocation orientation: the basic knowledge of collocation, including its definition and its types and patterns. Task 2 was an independent underlining task: Students were encouraged to search and underline the collocations they recognized in the given reading text. The underlining task served two purposes: (1) a self-directed activity to notice collocations, and (2) a measure of awareness of collocations. In order to prevent some participants from randomly underlining whatever they thought would be a collocation, the researcher teacher set two rules: (1) Each underlined collocation should belong to one of the six types introduced in the collocation orientation; (2) participants should underline those collocations that could be easily transferred to writing. Task 3 was learning highlighted collocations or highlighted and L1 glossed collocations: After searching for collocations independently, students were given the same text with the target collocations enhanced by two input enhancement methods: highlighted collocations (hereafter referred to IE1) and highlighted and L1 glossed collocations (hereafter referred to IE2). An example of collocations enhanced by IE1 and IE2 is as follows:

> *Also, skilled artisans did not work by the clock, at a **steady pace**, but rather in bursts of intense labor alternating with more leisurely time*. (IE1)

> *When several individuals of the same species or of several different species depend on the same limited resource, a **situation** may **arise** [情况出现] that is referred to as competition*. (IE2)

Through such a design, which combines the basic knowledge of collocation with collocation noticing strategies, learners can develop an understanding of the range and patterns of collocation and transfer this knowledge to subsequent collocations they will encounter in the reading materials.

3.3.2 Reading materials and target collocations

Lewis (2000) pointed out that one of the most important strategies for teaching collocations is to select appropriate texts. What texts to use depends on what the class aims for. Considering the TOEFL reading course in a tutorial school, the best choice is the officially released reading texts, which are authentic college-level passages, according to ETS. Authentic texts are considered a useful teaching tool with many benefits, including providing learners with words in context with associated collocations, authentic reading opportunities, and classroom exposure (Donnellan & Mark, 2014). The six officially released reading texts in this study are not only a rich, authentic source of collocation but also an exposure to texts that the students may encounter in university academic programs, so they may be a good source of learner motivation (Attar & Allami, 2013).

Considering the limited time of TOEFL reading classes in the tutorial environment, the collocations in this paper focused on two-word lexical collocations, especially those consisting of the main parts of speech, including adjective, verb, noun, and adverb. The two-word lexical collocations were further classified into six collocation types:

1. Adj. + noun (e.g., *limited source*)
2. Verb + noun (e.g., *fulfill dreams*)
3. Noun + noun (e.g., *labor movement*)
4. Noun + verb (e.g., *situations arise*)
5. Verb + adv. (e.g., *differ widely*)
6. Adv. + adj. (e.g., *potentially misleading*)

For learners, the most valuable collocations are those with medium strength (Lackman, 2011), which means that collocations are neither too strong like idioms nor too weak like free collocations. In order to ensure the quality of each selection, the researcher teacher confirmed that the selected collocations were medium-strength collocations in the *Oxford Online Collocation Dictionary*. Given the limited class time, 60 lexical collocations were selected from the six reading texts, with ten targeted collocations each, regarding their utility and teachability (Bore & Lindstromberg, 2009).

3.3.3 Tests

Tests may have positive backwash effects, thereby increasing learners' awareness of the importance of lexical chunks (Vasiljevic, 2014), and can be used as a pedagogical tool to increase collocation retention (Altenberg & Granger, 2001). With this in mind, the study used tests to triangulate qualitative data. There were a series of tests: a vocabulary test, a pre-collocation test, a post-collocation test, and six in-class practice tests. The vocabulary test consisted of 111 words in the 60 two-word target collocations; it was designed to determine the relationship between a participant's collocation performance and vocabulary performance. The pre-collocation test consisted of 20 randomly selected target collocations, and the post-collocation test examined the same but randomized collocations to account for the order effect. The regular in-class practice tests, each testing ten target collocations, were designed to determine the effect of noticing instructions. All tests were modeled after the test of Eyckmans (2009): an L2 sentence cloze item, with the base word of a collocation removed while two letters were intentionally left to limit the multiple responses of different types of the collocation. One test example is as follows:

> *Su_____ evidence comes from research showing that aggressive people often distort other people's motives*. (answer: Supporting)

3.3.4 Semi-structured interviews and questionnaires

Interviews can be used to explore the experiences, views, and attitudes of individual participants on

specific issues, thus providing an in-depth and comprehensive description and analysis of a study (Dörnyei, 2007). Three semi-structured interviews were audio-recorded with the consent of the participants and then transcribed verbatim. The questions were prepared guiding questions, mainly about personal learning experiences, opinions, feelings, and knowledge. In addition to the interviews, two questionnaires were administered to search for the opinions of the participants. The researcher used Dorkchandra's (2015) opinion questionnaire as a framework and slightly adjusted the wording and ordering of some question items. The first questionnaire (Q1) contained 10 items, and the second questionnaire (Q2) contained 14 items. Both included an extra open-ended item to look for some in-depth or unexpected thoughts.

3.4 Data collection and analysis

This multi-case study lasted six weeks and gathered rich data through two data collection methods (see Table 2): qualitative data from semi-structured interviews and questionnaires, which can directly answer RQ1 and RQ2; and quantitative data, which can be used to triangulate participants' responses to RQ1. By adopting both qualitative and quantitative sources, this study can more fairly demonstrate the cognitive processes of a low level of awareness. The detailed process of data collection is shown in Appendix 1.

Table 2

Data Collected in the Study

Data	Number	Purpose
Qualitative Data		
▪ Semi-structured interview	15	To answer RQ1 & RQ2
▪ Questionnaire	10	
Quantitative Data		
▪ Vocabulary test	5	To answer RQ1
▪ Pre-collocation test	5	
▪ Post-collocation test	5	
▪ In-class practice test	30	
▪ Underlining task	30	

3.4.1 Quantitative data analysis

Quantitative analysis was performed on the data obtained from all tests and the underlining tasks. Specifically, the results of the vocabulary test were compared with those of the pre- collocation test to analyze the relationship between participants' vocabulary knowledge and collocation competence. In each case, the results of the pre- and post- collocation test and the results of the underling tasks were compared to analyze the effectiveness of the reading intervention.

3.4.2 Qualitative data analysis

Two questionnaires and three semi-structured interview transcripts were analyzed in an inductive qualitative method. Thematic charts were created initially to show the responses of different participants to the same question so as to facilitate the search for patterns and themes (Ritchie et al., 2003). Afterwards, the researcher coded them by looking for keywords or repetitive themes in the participants' responses with regards to the noticing instructions in the reading intervention. The themes were guided

by two research questions, as they allowed the examination and description of learners' attitudes and their collocation performances during and after the reading intervention.

4 Findings

4.1 Collocation knowledge before and after the reading intervention
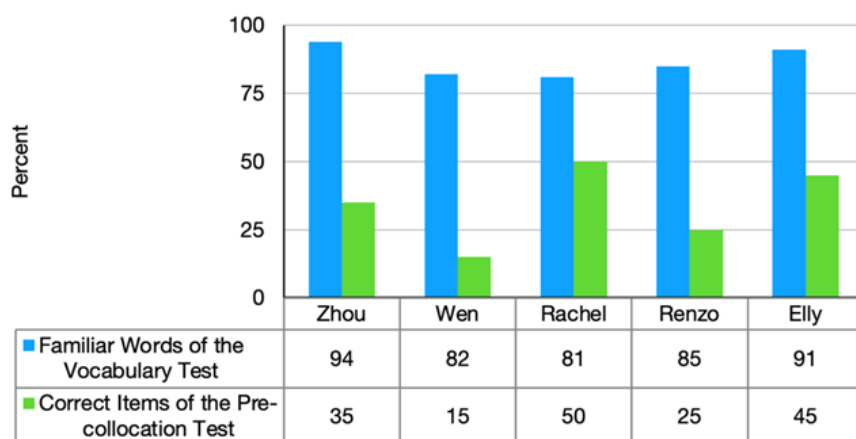
4.1.1 Collocation knowledge before the reading intervention

The analysis of the six pre-collocation tests revealed that the collocation performance of the five participants was quite low. The proportion of correctly answered collocation items was not more than 50%: Rachel was the highest - 50%, and Wen was the lowest - 15% (see Figure 1). On the contrary, their performance on the vocabulary test (see Figure 1) showed a higher level of vocabulary knowledge. Each participant knew more than 80% of the tested words. Obviously, the collocation learning rate of the participants did not match their vocabulary learning rate.

The preliminary analysis of the first interviews discovered that none of the participants had ever heard of the word *collocation*. Just in case the learners may know what collocation means but may not be familiar with the term, the researcher explained the definition of collocation and distinguished grammatical collocations, such as *necessary to*, *think over*, from lexical collocations, such as *heavy rain*, *strong tea*. Still, four participants (except Elly) replied that they had learned such phrases as *necessary to*, but they were not familiar with the term - grammatical collocation, and they had never been taught or learned lexical collocations. Elly was the only one who knew what collocation is but was not familiar with the term. Clearly, it would be the first opportunity for them to systematically learn collocation in the reading intervention.

Figure 1

A Comparison Between Participant's Performances on the Vocabulary Test and Pre-Collocation Test

	Zhou	Wen	Rachel	Renzo	Elly
■ Familiar Words of the Vocabulary Test	94	82	81	85	91
■ Correct Items of the Pre-collocation Test	35	15	50	25	45

In addition, the analysis of the first interviews revealed that although the participants knew most of the tested vocabulary, they rarely used these words in speaking and writing. Obviously, their previous vocabulary learning experiences focused more on quantitative learning than qualitative learning. It was discovered that the learners' vocabulary learning experience was mainly affected by a time-saving strategy. All learners found that their vocabulary size was lower than the TOEFL requirement, so they had to recite as many words as possible in a short time. The primary vocabulary learning tool chosen was

the printed vocabulary book, which lists the academic vocabulary required for the test. *The Vocabulary for TOEFL Test* was the most popular one for the learners and was believed useful for vocabulary learning. Rachel said:

> *I like printed vocabulary book because it is convenient and comprehensive. Every word is accompanied with its phonetic symbol, Chinese meaning, and synonyms. There is also a QR code, and students can scan the code to listen to the pronunciation. Some words are provided with sentence examples, and some with pictures. I often read the sentences and memorize the phases in the sentence. They are useful.*
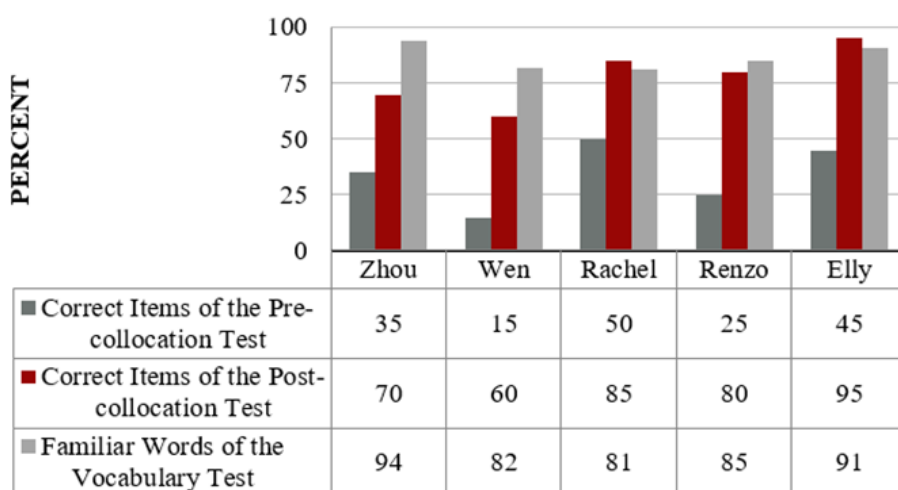
It was also found that some participants (Zhou, Renzo) would not take learning new words through reading as their main vocabulary learning method. Zhou said, "*Learning new words through reading is not efficient. I like vocabulary lists, which usually include a hundred of words.*" Renzo also expressed his unwillingness to learn new words through reading, saying that "*Words in the reading texts are mainly academic words, which are more complex and harder to memorize.*" Most participants (Elly, Zhou, Renzo, Wen) had the habit of listing new words learned in class in a vocabulary notebook, just the same way as in a printed vocabulary book. However, they rarely reviewed these words due to the pressure of learning more new words. It seemed that they would rather spend more time learning new words than reviewing the words they have learned, which can be considered as a time-saving vocabulary learning strategy.

4.1.2 Collocation knowledge after the reading intervention

The analysis of the post-collocation tests after the six-week reading intervention showed significant improvement in collocation learning, as shown in Figure 2.

Figure 2

A Comparison Between Participant's Performances on the Vocabulary Test and Pre- and Post-Collocat ion Tests

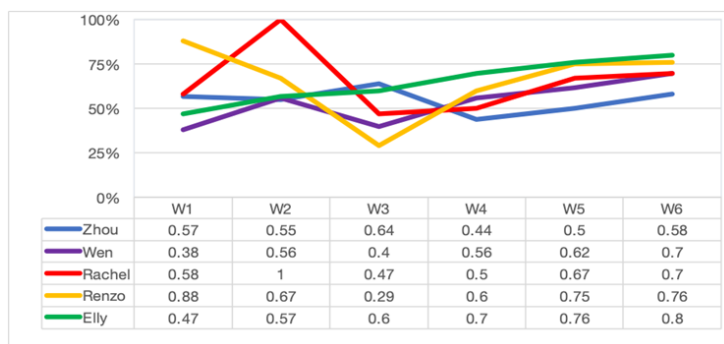|	Zhou	Wen	Rachel	Renzo	Elly
■ Correct Items of the Pre-collocation Test	35	15	50	25	45
■ Correct Items of the Post-collocation Test	70	60	85	80	95
■ Familiar Words of the Vocabulary Test	94	82	81	85	91

Compared with her first performance in the pre-collocation test, Elly showed the most significant improvement: from 45% in the pre-test to 95% in the post-test. The collocation knowledge of Wen and Rachel both increased by 45%, while the collocation knowledge of Renzo and Zhou increased by 35%. On the other hand, a comparison between the vocabulary test and the post-collocation test showed that the collocation performance of Rachel and Elly surpassed their initial vocabulary knowledge, indicating an influence of collocation learning on vocabulary knowledge. Unlike Elly, Rachel was studying at an

English-speaking university, so her language exposure is greater than Elly's. However, their collocation performances were similar, which seems to indicate that if learners do not have collocation knowledge, language exposure can be believed to have little effect on their collocation learning.

When analyzing the underlined collocations, the researcher found that some were medium-strength collocations (e.g., *steady pace, fundamental change*), while others were free collocations (e.g., *impart knowledge, constant pace, gain impact, intense labor*). Since medium-strength collocations are the most important collocations for students (Lackman, 2011), the participant's performance in the underlining tasks was based on the percentage of medium-strength collocations among all the underlined collocations. The effect of each participant's underlining tasks is shown in Figure 3.

Figure 3

Participant's Performances in the Underlining Task

|	W1	W2	W3	W4	W5	W6
Zhou	0.57	0.55	0.64	0.44	0.5	0.58
Wen	0.38	0.56	0.4	0.56	0.62	0.7
Rachel	0.58	1	0.47	0.5	0.67	0.7
Renzo	0.88	0.67	0.29	0.6	0.75	0.76
Elly	0.47	0.57	0.6	0.7	0.76	0.8

At first sight, the figure for other participants except Elly fluctuated greatly in the first three weeks. However, careful observation revealed that the performance of all participants from W4 to W6 showed an upward trend. Take Wen as an example: His performance was significantly different in the first three weeks, but gradually improved in the next three weeks (52%, 62%, and 70% in W4, W5, and W6, respectively). Zhou, Rachel and Renzo also showed similar progress. This finding suggests that after three weeks of reading intervention, participants began to show a steady improvement in noticing collocation while reading.

A comparison of the six in-class practice tests and the underlining tasks of each participant (see Figure 4) showed that the teacher-guided noticing instruction was more effective than self-noticing. Elly's collocation performance had increased from 65% in self-noticing to 100% in teacher-guided noticing. Other participants also showed a higher correct rate in teacher-guided noticing: close to 80% and above.

Figure 4

Effect of Teacher-Guided Noticing and Self-Noticing
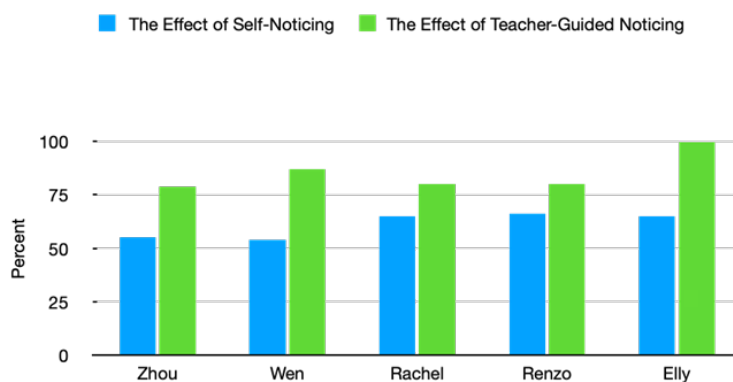
Further analysis of the six in-class practice tests (see Figure 5) discovered that two of the participants (Zhou and Rachel) scored higher under IE2 in the last three weeks, while the other three participants (Elly, Wen, and Renzo) respectively showed exactly the same results under IE1 in the first three weeks and IE2 in the last three weeks. This finding can be concluded that IE1 and IE2 did not differ significantly in the collocation knowledge for the participants in this study.

Figure 5

Mean Score of the In-Class Practice Test
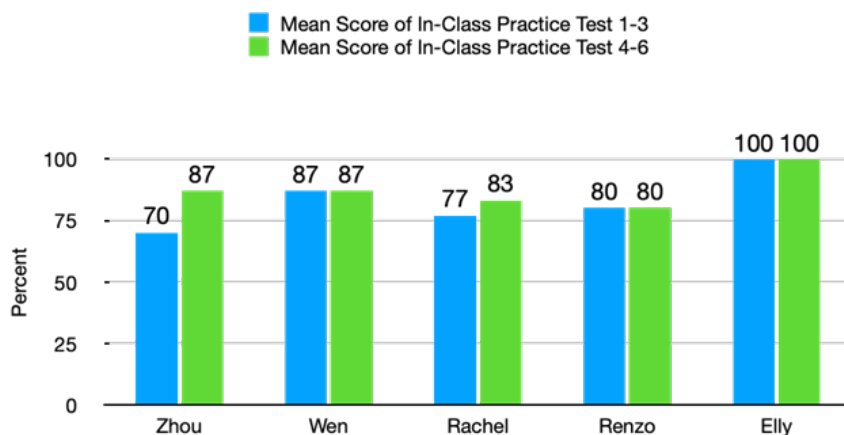
Surprisingly, the qualitative data analysis revealed different results. IE2 was strongly preferred by the participants, as evidenced by Item 12 and Item 13 in Q2 (see Table 3). The same result was also discovered in the analysis of the third interviews. The participants elaborated on their preference for IE2. Zhou said, "*The two input enhancements have no difference in drawing my attention. Both can help me notice collocations. But I prefer the one with Chinese meaning (IE2) because it could help me with deeper memory.*" Zhou's performance under IE2 was indeed better than under IE1. It can be concluded that the Chinese glossing has indeed brought participants a positive impact. Elly expressed a similar attitude: "*The Chinese glossaries (IE2) can help me understand the collocations better and are easier to memorize.*" However, Elly's preference for IE2 did not affect her performance under IE2. Therefore, it can be concluded that IE2 was strongly favored because the participants believed that it would help memorize collocations, but in fact, most of the participants' collocation performance had not been greatly affected by IE2.

Table 3

Participants' Attitudes Towards IE1 and IE2

Items in Q2	Zhou	Wen	Rachel	Renzo	Elly
12. I find it easier to memorize the collocations with Chinese glossing than without.	strongly agree	strongly agree	strongly agree	strongly agree	strongly agree
13. I prefer learning collocations with Chinese glossing in texts than without Chinese glossing.	strongly agree	strongly agree	strongly agree	strongly agree	strongly agree

4.2 Attitude towards noticing collocations

First of all, the participants were motivated to learn collocations and thought the collocation orientation

was useful. Their responses in the collocation orientation showed that though collocation learning was new to them, they displayed great interest in learning it by asking questions and giving examples of what they thought were collocations. For instance, Renzo thought English collocations were just like Chinese four-character idioms. The researcher then explained the similarities and differences between the two by providing more English and Chinese examples such as "stark contrast" and "鲜明对比." In addition, the analysis of the qualitative data from Q2 showed that the participants thought the collocation noticing instruction was helpful (see Table 4). Their responses regarding Item 5 and Item 11 in Q2 indicated that they had a positive attitude towards the usefulness of collocation learning.

Table 4

Participants' Attitude Towards IE1and IE2

Items in Q2	Zhou	Wen	Rachel	Renzo	Elly
5. The instruction of collocation noticing is helpful.	agree	agree	strongly agree	strongly agree	strongly agree
11. I will recommend noticing collocation to other English learners.	strongly agree	strongly agree	strongly agree	strongly agree	strongly agree

A similar result was also found by analyzing the open-ended item in Q1. Zhou believed that the collocation learning would be helpful to writing and reading. She wrote:

> *It (collocation) is very good. There will be no wrong collocation in my writing. More attention will be paid to things that were previously considered unimportant, and it will be of great help to writing and reading.*

Three weeks later in Q2, she wrote:

> *Through collocation learning and practice, it is easier to understand reading texts and listening passages. I can read faster. It is helpful for reading. And also, when writing a passage, I can replace single word with collocation.*

Renzo also expressed his expectation on collocation learning in Q1, and he wrote:

> *It (collocation) is useful for my English study. I could learn more native English-speaking style because of the collocation. It would benefit my English speaking and reading, and I would recommend collocation learning to my friends.*

Secondly, the analysis of the qualitative data Q1 and Q2 revealed that collocation noticing was considered very challenging in the first place. In Item 5 of Q1, "*collocation noticing is easy for me*" (at the end of W3), most participants chose "neutral," which, the researcher believed, was a polite way to say "disagree." However, their attitude changed at the end of W6. Most participants chose "agree" for the same Item in Q2 "*collocation noticing is easy for me.*" In addition, the analysis of the third interviews found that participants adopted different collocation noticing strategies. Some participants used language patterns to look for collocations, while others relied on the usage of collocations in writing and speaking. "*I use the types of collocations you introduced such as adjective and noun, verb and noun to look for collocations, and I had strong feelings towards collocation due to the practice*" (Zhou, Interview 3). "*I noticed the adjacent words, and if they could be used in writing in the future, I would record and review it*" (Elly, Interview 3). The change of the attitude and these different collocation noticing strategies suggested that participants were paying attention to collocations through their own efforts.

    Thirdly, the participants thought independent collocation noticing was time-consuming. The responses of three items related to their after-class language learning behavior (looking for collocations, consulting a dictionary, and recording collocations) were the same: "neutral." This response could be understood as a polite way of expressing "disagree." The analysis of the third interviews revealed

the reason for this polite "disagree." "*I don't have the habit of recording words. Even if I did, I would rarely go review them*" (Wen). "*It took too much time to look up the collocations in the dictionary. It is inconvenient*" (Rachel). From their answers, it can be found that noticing collocation independently was unappealing to the participants because of the time cost. Obviously, the participants adopted the same time-saving strategy in learning collocations as in learning new vocabulary. Besides, the role of collocations in English studying might be inadequately understood by the participants. If the importance of collocation could be constantly emphasized by all language teachers, then participants may be willing to spend time learning it.

Finally, the analysis of the second and third interviews discovered that participants were worried about the opportunity to transfer collocation learning to writing. They explained in detail in the third interviews: "*What I learned in the reading class was not fully used in writing. It seems that I had not accumulated enough collocations in writing*" (Renzo), and "*I'm now at the stage of noticing and accumulating collocations, and I began to notice and learn collocations through reading text. But I don't have much opportunity to use the collocations learned in the reading*" (Elly). For the participants, collocation learning was more a passive learning than an active learning. Externally, this was due to the curriculum design of the institution: Reading and writing were taught as two independent courses. Internally, the participants may not be fully motivated; otherwise, they would create opportunities for themselves to use the collocations that they had learned in reading. Due to the problem of the curriculum and the lack of internal motivation for collaborating learning, participants lacked the confidence to transform passive learning into active learning.

5 Discussion

This paper has explored the effect of noticing collocation in reading and learners' attitudes towards noticing instructions in reading classes. Through the analysis of quantitative and qualitative data, the researcher discovered that the participants' awareness of collocation after the reading intervention increased significantly. In response to RQ1, integrating collocation instruction into reading class can raise learners' awareness of collocation to the following extent: (1) Their knowledge of collocation had changed from "not knowing" to "very helpful"; (2) their collocation performance improved significantly, with the best case observed from Elly (from 45% to a 95% confidence level). In addition, both self-noticing and teacher-guided collocation noticing strategies were effective in raising awareness, but the latter, especially IE2, was more popular, though there was no significant difference in collocation learning between IE1 and IE2. As for RQ2, five participants (1) were motivated to learn collocations at first and thought the collocation orientation was useful; (2) found that noticing collocation was quite challenging but changed attitude after the reading intervention; (3) thought that learning collocations independently was time-consuming; and (4) expressed concerns about the lack of opportunity to transfer.

One important finding is that learners' awareness of collocation can be raised to a significant extent by explicit teaching of collocation knowledge, self-directed noticing, and input enhancement methods. As shown in Figure 5, in the learning context where no collocation teaching is provided, the participants lacked collocation knowledge. The reading intervention in this study provided the participants with basic collocation knowledge so that they can systematically learn collocation knowledge, towards which the participants expressed a positive attitude. Since lack of collocation knowledge was proposed as one of the major reasons causing collocation incompetence and errors (Bahns & Eldaw, 1993; Farghal & Obiedat, 1995), the collocation orientation in this study has been proven to play an important role in collocation noticing. This finding substantiates the suggestion that the purpose of incorporating collocation teaching into the reading course is to raise students' awareness of collocations (Yang & Jiang, 2014). More importantly, it also confirms that systematic collocation teaching in reading was vital (Ördem

& Paker, 2016), because the systematic nature of vocabulary teaching was believed to lead to acquisition (Nation, 1990). Thus, it could be concluded that the basic collocation knowledge, including the definition and types of collocation, laid the foundation for collocation noticing and thus should not be neglected by teachers in collocation teaching.

In addition, it was found in 4.1.2 that the underlining task, an online/concurrent measure of noticing (Ahn, 2014), was effective in raising collocation awareness. This finding confirms that searching skills can make students notice collocations themselves (Woolard, 2000). Compared with self-noticing, the two input enhancement methods were found to be more significant in attracting participants. The result confirms the important role of reading with textual input enhancement and glossing in noticing collocation (Webb & Nation, 2017). Surprisingly, the finding that IE1 and IE2 did not differ significantly was in contrast to the study by Goudarzi and Moini (2012), who found a significant difference between L1 Glossed Group and the highlighted group. It could be concluded that the input enhancement approach, regardless of its presentation format, could be used as a noticing strategy to raise learners' awareness of collocations. Furthermore, the finding that language exposure seemed to have little impact on collocation knowledge is in accord with some research results (Lewis, 2000) that English exposure had a slight effect on collocational accuracy and had no effect in language classrooms. It is the explicit teaching that helps learners gain collocation awareness. This is in line with the finding of Ördem and Paker (2016), who valued the significance of explicit teaching for collocation noticing.

Figure 6

The Role of Reading Intervention
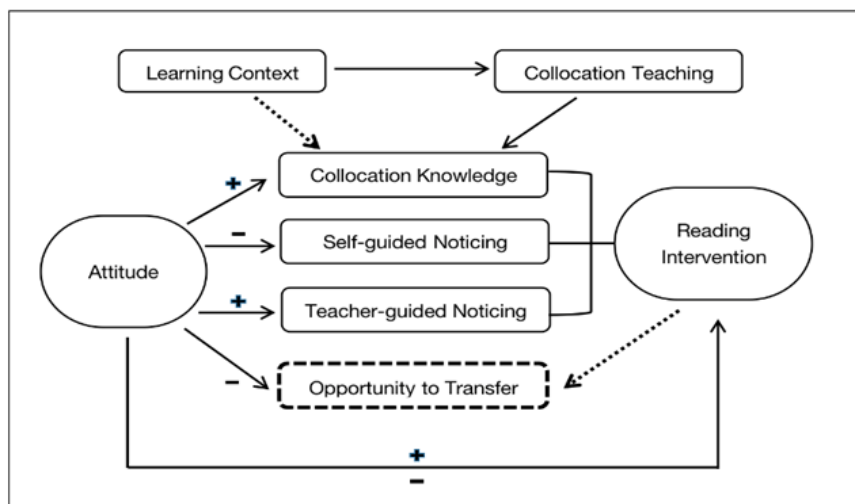
Another significant finding is that learners have complex attitudes towards collocation noticing, with both positive and negative attitudes (see Figure 6). Noticing linguistic elements relied on several factors, including prior knowledge and expectation created in part by instruction (Schmidt, 1995). The reason for the negative attitude towards noticing instructions can be attributed to previous vocabulary learning experience and motivation. Learners adopted a time-saving strategy in their prior vocabulary learning, which affected their attitude towards collocation learning. Since they had to search for collocations in reading and then use a collocation dictionary to check, these activities require time. This is just the opposite of the time-saving strategy they adopted in their prior vocabulary learning experience. Although it is suggested that learners can search for collocations in reading and then use collocation dictionaries (Conzett, 2000), the participants in this study obviously thought this suggestion was not effective. Instead, they preferred teacher-guided noticing because this method saves all the trouble. All target combinations are carefully selected and checked by the teacher, and all target collocations are visually

attractive because of the input enhancement methods, especially when studying the Chinese glossed collocations saves the time of looking up the meaning in a collocation dictionary. It is obvious that prior vocabulary learning experience, particularly, the time-saving strategy, plays a significant role in learners' attitude towards collocation noticing. This finding thus can be used to expand on the role of prior vocabulary knowledge on collocation learning (e.g., Vilkaitė, 2017; Vu & Peters, 2021) that vocabulary learning strategy will affect collocation learning strategy.

On the other hand, learners' motivation to learn collocation, triggered by the reading intervention, affects their attitude towards collocation noticing. The participants' great interest in learning collocation was due to the reading materials and systematic week by week collocation teaching. This finding confirms that authentic reading materials are a good source of learner motivation (Attar & Allami, 2013) and that systematic week by week collocation teaching can also motivate collocation learning (Ördem & Paker, 2016). Triggered by these external motivational factors, learners showed great interest in noticing collocation in reading. However, they were not confident enough to transfer the collocations learned from reading to writing. Their lack of self-confidence showed that just realizing the usefulness of collocations was not enough for learners; they lacked the internal motivation to learn collocations. This finding confirms that for input to become intake, motivation matters (Lewis, 1993): Besides seeing the usefulness of learning the target language, learners should be motivated to voluntarily wish to turn input into intake. This research is also consistent with the conclusions put forward by Asbulah et al. (2020) that the higher the external and internal motivation, the higher the collocation knowledge.

Therefore, the role of reading intervention in this study can be understood as a comprehensive and effective way of collocation noticing and a motivation trigger for collocation acquisition. Since reading can be an opportunity to deliberately learn vocabulary, incorporating collocation noticing into reading not only provides learners with a great access to authentic reading materials but also raises learners' awareness of collocation learning. In line with the literature, noticing strategies benefit learners by teaching basic knowledge of collocation through reading materials (Conzett, 2000), challenge them through self-directed collocation searching (Woolard, 2000), and improve their collocation competence through teacher-guided instruction (Hill, 2000). On the other hand, the reading intervention serves as an effective extrinsic motivation trigger by using authentic reading materials (Attar & Allami, 2013) and adopting teaching collocations explicitly and systematically (Ördem & Paker, 2016), making learners aware of the importance of collocation learning. However, other interventions are needed to play a role in the learners' intrinsic motivation.

6 Conclusion

This multi-case study explored five Chinese EFL learners on the effectiveness of noticing collocations in reading and their attitude towards noticing instructions over a prolonged period in a natural English language learning setting. The findings reveal that learners' awareness of collocations can be raised by the reading intervention, but their attitude towards the reading intervention was affected by their previous vocabulary learning and their motivation. The discussion about the research findings to some extent validates the noticing hypothesis (Schmidt, 1995) and the lexical approach in the natural classroom setting. On these bases, some pedagogical implications are suggested for teachers and learners in terms of how to motivate learners to notice and learn collocations over a long time.

First, collocations should be introduced to English learners at the earliest possible stage. Collocation awareness is not an advanced language, so it can be introduced from the earliest stages (Lewis, 1993). In the beginning, learners may encounter some difficulties in noticing collocations independently, which may reduce their motivation. Teachers can use some textual input enhancement methods or design various awareness-raising tasks in the class not only to help learners notice collocations but also

to reinforce the concept of collocation. Secondly, collocation noticing should be highlighted in every English skill, as noticing is a key component of vocabulary learning (Webb & Nation, 2017). The more teachers emphasize the importance of collocation, the more likely learners are to realize its importance and to be motivated to transfer to speaking and writing. Thirdly, the integration of collocation in a reading and writing course is vital since it can provide learners with the opportunity to immediately transfer passive input into active intake.

It ought to be noted that this study has several possible limitations. First, the research was conducted at a language institution where only five participants preparing for TOEFL were selected. The results ought not to be generalized to other learning contexts or apply to other English learning programs. However, the aim of a case study is to provide a thick description and in-depth analysis of a phenomenon in a particular context. The qualitative and quantitative methods adopted in this study produced a fairer picture of the cognitive processes of noticing collocation. The in-depth research of the attitudes of different learners towards noticing collocations in reading serves two purposes: to establish a strong bond between SLA research and L2 classrooms and to provide pedagogical benefits for the application of learner-centered instruction in language institutions. Another major limitation relates to research design. Since this research mainly studied and analyzed collocation noticing from the perspective of reading, the challenge remains to whether the collocation obtained in reading can be effectively transferred in writing. As an essential but often neglected element in vocabulary learning, collocation is worthy of research. In all aspects of collocation teaching, noticing collocation is the first step for L2 learners. Shifting learners' attention from vocabulary size to collocation learning has a great impact on their vocabulary learning. The next step will be to find effective ways to help learners form long-term memories of the collocations they have learned, and meanwhile create opportunities to transfer passive learning into active learning. Large-scale research on learner attitudes and teacher beliefs can also be conducted to provide more support for the teaching plans and curriculum design of language institutions and school programs.

Appendix A

The Procedure of the Study

Stage	Data Collection Method
Stage 1	▪ Vocabulary test ▪ Pre-collocation test ▪ Interview 1
Stage 2	Week 1 ▪ Reading Intervention 1 ▪ In-class practice test 1
	Week 2 ▪ Reading Intervention 2 ▪ In-class practice test 2
	Week 3 ▪ Reading Intervention 3 ▪ In-class practice test 3 ▪ Questionnaire 1 ▪ Interview 2
	Week 4 ▪ Reading Intervention 4 ▪ In-class practice test 4
	Week 5 ▪ Reading Intervention 5 ▪ In-class practice test 5
	Week 6 ▪ Reading Intervention 6 ▪ In-class practice test 6

| Stage 3 | ■ Post-collocation test
■ Questionnaire 2
■ Interview 3 |

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